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Equation to Ethics

Articles in This Slice

EQUATION (from Lat. *aequatio*, *aequare*, to equalize), an expression or statement of the equality of two quantities. Mathematical equivalence is denoted by the sign =, a symbol invented by Robert Recorde (1510-1558), who considered that nothing could be more equal than two equal and parallel straight lines. An equation states an equality existing between two classes of quantities, distinguished as known and unknown; these correspond to the data of a problem and the thing sought. It is the purpose of the mathematician to state the unknowns separately in terms of the knowns; this is called solving the equation, and the values of the unknowns so obtained are called the roots or solutions. The unknowns are usually denoted by the terminal letters, ... x, y, z, of the alphabet, and the knowns are either actual numbers or are represented by the literals a, b, c, &c..., *i.e.* the introductory letters of the alphabet. Any number or literal which expresses what multiple of term occurs in an equation is called the coefficient of that term; and the term which does not contain an unknown is called the absolute term. The degree of an equation is equal to the greatest index of an unknown in the equation, or to the greatest sum of the indices of products of unknowns. If each term has the sum of its indices the same, the equation is said to be homogeneous. These definitions are exemplified in the equations:—

$$(1)\ ax^2 + 2bx + c = 0,$$
$$(2)\ xy^2 + 4a^2x = 8a^3,$$
$$(3)\ ax^2 + 2hxy + by^2 = 0.$$

In (1) the unknown is x, and the knowns a, b, c; the coefficients of x^2 and x are a and 2b; the absolute term is c, and the degree is 2. In (2) the unknowns are x and y, and the known a; the degree is 3, *i.e.* the sum of the indices in the term xy^2. (3) is a homogeneous equation of the second degree in x and y. Equations of the first degree are called *simple* or *linear*; of the second, *quadratic*; of the third, *cubic*; of the fourth, *biquadratic*; of the fifth, *quintic*, and so on. Of equations containing only one unknown

the number of roots equals the degree of the equation; thus a simple equation has one root, a quadratic two, a cubic three, and so on. If one equation be given containing two unknowns, as for example $ax + by = c$ or $ax^2 + by^2 = c$, it is seen that there are an infinite number of roots, for we can give x, say, any value and then determine the corresponding value of y; such an equation is called *indeterminate*; of the examples chosen the first is a linear and the second a quadratic indeterminate equation. In general, an indeterminate equation results when the number of unknowns exceeds by unity the number of equations. If, on the other hand, we have two equations connecting two unknowns, it is possible to solve the equations separately for one unknown, and then if we equate these values we obtain an equation in one unknown, which is soluble if its degree does not exceed the fourth. By substituting these values the corresponding values of the other unknown are determined. Such equations are called *simultaneous*; and a simultaneous system is a series of equations equal in number to the number of unknowns. Such a system is not always soluble, for it may happen that one equation is implied by the others; when this occurs the system is called *porismatic* or *poristic*. An *identity* differs from an equation inasmuch as it cannot be solved, the terms mutually cancelling; for example, the expression $x^2 - a^2 = (x - a)(x + a)$ is an identity, for on reduction it gives $0 = 0$. It is usual to employ the sign $\equiv$ to express this relation.

> An equation admits of description in two ways:—(1) It may be regarded purely as an algebraic expression, or (2) as a geometrical locus. In the first case there is obviously no limit to the number of unknowns and to the degree of the equation; and, consequently, this aspect is the most general. In the second case the number of unknowns is limited to three, corresponding to the three dimensions of space; the degree is unlimited as before. It must be noticed, however, that by the introduction of appropriate hyperspaces, *i.e.* of degree equal to the number of unknowns, any equation theoretically admits of geometrical visualization, in other words, every equation may be represented by a geometrical figure and every geometrical figure by an equation. Corresponding to these two aspects, there are two typical methods by which equations can be solved, viz. the algebraic and geometric. The former leads to exact results, or, by methods of approximation, to results correct to any required degree of accuracy. The latter can only yield approximate values: when theoretically exact constructions are available there is a source of error in the draughtsmanship, and when the constructions are only approximate, the accuracy of the results is more problematical. The geometric aspect, however, is of considerable value in discussing the theory of equations.

History.—There is little doubt that the earliest solutions of equations are given, in the Rhind papyrus, a hieratic document written some 2000 years before our era. The problems solved were of an arithmetical nature, assuming such forms as "a mass and its ⅐th makes 19." Calling the unknown mass x, we have given $x + \frac{1}{7}x = 19$, which is a simple equation. Arithmetical problems also gave origin to equations involving two unknowns; the early Greeks were familiar with and solved simultaneous linear equations, but indeterminate equations, such, for instance, as the system given in the "cattle problem" of Archimedes, were not seriously studied until Diophantus solved many particular problems. Quadratic equations arose in the Greek investigations in the doctrine of proportion, and although they were presented and solved in a geometrical form, the methods employed have no relation to the generalized conception of algebraic geometry which represents a curve by an equation and vice versa. The simplest quadratic arose in the construction of a mean proportional (x) between two lines (a, b), or in the construction of a square equal to a given rectangle; for we have the proportion $a:x = x:b$; *i.e.* $x^2 = ab$. A more general equation, viz. $x^2 - ax + a^2 = 0$, is the algebraic equivalent of the problem to divide a line in medial section; this is solved in *Euclid*, ii. 11. It is possible that Diophantus was in possession of an algebraic solution of quadratics; he recognized, however, only one root, the interpretation of both being first effected by the Hindu Bhaskara. A simple cubic equation was presented in the problem of finding two mean proportionals, x, y, between two lines, one double the other. We have $a:x = x:y = y:2a$, which gives $x^2 = ay$ and $xy = 2a^2$; eliminating y we obtain $x^3 = 2a^3$, a simple cubic. The Greeks could not solve this equation, which also arose in the problems of duplicating a cube and trisecting an angle, by the ruler and compasses, but only by mechanical curves such as the cissoid, conchoid and quadratrix. Such solutions were much improved by the Arabs, who also solved both cubics and biquadratics by means of intersecting conics; at the same time, they developed methods, originated by Diophantus and improved by the Hindus, for finding approximate roots of numerical equations by algebraic processes. The algebraic solution of the general cubic and biquadratic was effected in the 16th century by S. Ferro, N. Tartaglia, H. Cardan and L. Ferrari (see Algebra: *History*). Many fruitless attempts were made to solve algebraically the quintic equation until P. Ruffini and N.H. Abel proved the problem to be impossible; a solution involving elliptic functions has been given by C. Hermite and L. Kronecker, while F. Klein has given another solution.

In the geometric treatment of equations the Greeks and Arabs based their constructions upon certain empirically deduced properties of the curves and figures employed. Knowing various metrical relations, generally expressed as proportions, it was found possible to solve particular equations, but a general method was wanting. This lacuna was not filled until the 17th century, when Descartes discovered the general theory which explained the nature of such solutions, in particular those wherein conics were employed, and, in addition, established the most important facts that every equation represents a geometrical locus, and conversely. To represent equations containing two unknowns, x, y, he chose two axes of reference mutually perpendicular, and measured x along the horizontal axis and y along the vertical. Then by the methods described in the article Geometry: *Analytical*, he showed that—(1) a linear equation represents a straight line, and (2) a quadratic

represents a conic. If the equation be homogeneous or break up into factors, it represents a number of straight lines in the first case, and the loci corresponding to the factors in the second. The solution of simultaneous equations is easily seen to be the values of x, y corresponding to the intersections of the loci. It follows that there is only one value of x, y which satisfies two linear equations, since two lines intersect in one point only; two values which satisfy a linear and quadratic, since a line intersects a conic in two points; and four values which satisfy two quadratics, since two conics intersect in four points. It may happen that the curves do not actually intersect in the theoretical maximum number of points; the principle of continuity (see Geometrical Continuity) shows us that in such cases some of the roots are imaginary. To represent equations involving three unknowns x, y, z, a third axis is introduced, the z-axis, perpendicular to the plane xy and passing through the intersection of the lines x, y. In this notation a linear equation represents a plane, and two linear simultaneous equations represent a line, *i.e.* the intersection of two planes; a quadratic equation represents a surface of the second degree. In order to graphically consider equations containing only one unknown, it is convenient to equate the terms to y; *i.e.* if the equation be $f(x) = 0$, we take $y = f(x)$ and construct this curve on rectangular Cartesian co-ordinates by determining the values of y which correspond to chosen values of x, and describing a curve through the points so obtained. The intersections of the curve with the axis of x gives the real roots of the equation; imaginary roots are obviously not represented.

In this article we shall treat of: (1) Simultaneous equations, (2) indeterminate equations, (3) cubic equations, (4) biquadratic equations, (5) theory of equations. Simple, linear simultaneous and quadratic equations are treated in the article Algebra; for differential equations see Differential Equations.

I. *Simultaneous Equations.*

Simultaneous equations which involve the second and higher powers of the unknown may be impossible of solution. No general rules can be given, and the solution of any particular problem will largely depend upon the student's ingenuity. Here we shall only give a few typical examples.

1. *Equations which may be reduced to linear equations.—Ex.* To solve $x(x - a) = yz$, $y(y - b) = zx$, $z(z - c) = xy$. Multiply the equations by y, z and x respectively, and divide the sum by xyz; then

$$\frac{a}{z} + \frac{b}{x} + \frac{c}{y} = 0 \qquad (1).$$

Multiply by z, x and y, and divide the sum by xyz; then

$$\frac{a}{y} + \frac{b}{z} + \frac{c}{x} = 0 \qquad (2).$$

From (1) and (2) by cross multiplication we obtain

$$\frac{1}{y(b^2 - ac)} = \frac{1}{z(c^2 - ab)} = \frac{1}{x(a^2 - bc)} = \frac{1}{\lambda} \text{ (suppose)} \qquad (3).$$

Substituting for x, y and z in $x(x - a) = yz$ we obtain

$$\frac{1}{\lambda} = \frac{3abc - (a^3 + b^3 + c^3)}{(a^2 - bc)(b^2 - ac)(c^2 - ab)};$$

and therefore x, y and z are known from (3). The same artifice solves the equations $x^2 - yz = a$, $y^2 - xz = b$, $z^2 - xy = c$.

2. *Equations which are homogeneous and of the same degree.*—These equations can be solved by substituting $y = mx$. We proceed to explain the method by an example.

Ex. To solve $3x^2 + xy + y^2 = 15$, $31xy - 3x^2 - 5y^2 = 45$. Substituting $y = mx$ in both these equations, and then dividing, we obtain $31m - 3 - 5m^2 = 3(3 + m + m^2)$ or $8m^2 - 28m + 12 = 0$. The roots of this quadratic are $m = \frac{1}{2}$ or 3, and therefore $2y = x$, or $y = 3x$.

Taking $2y = x$ and substituting in $3x^2 + xy + y^2 = 0$, we obtain $y^2(12 + 2 + 1) = 15$; $\therefore y^2 = 1$, which gives $y = \pm 1$, $x = \pm 2$. Taking the second value, $y = 3x$, and substituting for y, we obtain $x^2(3 + 3 + 9) = 15$; $\therefore x^2 = 1$, which gives $x = \pm 1$, $y = \pm 3$. Therefore the solutions are $x = \pm 2$, $y = \pm 1$ and $x = \pm 1$, $y = \pm 3$. Other artifices have to be adopted to solve other forms of simultaneous equations, for which the reader is referred to J.J. Milne, *Companion to Weekly Problem Papers*.

II. *Indeterminate Equations.*

1. When the number of unknown quantities exceeds the number of equations, the equations will admit of innumerable solutions, and are therefore said to be *indeterminate*. Thus if it be required to find two numbers such that their sum be 10, we have two unknown quantities x and y, and only one equation, viz. $x + y = 10$, which may evidently be satisfied by innumerable different values of x and y, if fractional solutions be admitted. It is, however, usual, in such questions as this, to restrict values of the numbers sought to positive integers, and therefore, in this case, we can have only these nine solutions,

x = 1, 2, 3, 4, 5, 6, 7, 8, 9;
y = 9, 8, 7, 6, 5, 4, 3, 2, 1;

which indeed may be reduced to five; for the first four become the same as the last four, by simply changing x into y, and the contrary. This branch of analysis was extensively studied by Diophantus, and is sometimes termed the Diophantine Analysis.

2. Indeterminate problems are of different orders, according to the dimensions of the equation which is obtained after all the unknown quantities but two have been eliminated by means of the given equations. Those of the first order lead always to equations of the form

$$ax \pm by = \pm c,$$

where a, b, c denote given whole numbers, and x, y two numbers to be found, so that both may be integers. That this condition may be fulfilled, it is necessary that the coefficients a, b have no common divisor which is not also a divisor of c; for if a = md and b = me, then ax + by = mdx + mey = c, and dx + ey = c/m; but d, e, x, y are supposed to be whole numbers, therefore c/m is a whole number; hence m must be a divisor of c.

Of the four forms expressed by the equation ax ± by = ±c, it is obvious that ax + by = −c can have no positive integral solutions. Also ax − by = −c is equivalent to by − ax = c, and so we have only to consider the forms ax ± by = c. Before proceeding to the general solution of these equations we will give a numerical example.

To solve 2x + 3y = 25 in positive integers. From the given equation we have x = (25 − 3y) / 2 = 12 − y − (y − 1) / 2. Now, since x must be a whole number, it follows that (y − 1)/2 must be a whole number. Let us assume (y − 1) / 2 = z, then y = 1 + 2z; and x = 11 − 3z, where z might be any whole number whatever, if there were no limitation as to the signs of x and y. But since these quantities are required to be positive, it is evident, from the value of y, that z must be either 0 or positive, and from the value of x, that it must be less than 4; hence z may have these four values, 0, 1, 2, 3.

If	z = 0,	z = 1,	z = 2,	z = 3;
Then	x = 11,	x = 8,	x = 5,	x = 2,
	y = 1,	y = 3,	y = 5,	y = 7.

3. We shall now give the solution of the equation ax − by = c in positive integers.

Convert a/b into a continued fraction, and let p/q be the convergent immediately preceding a/b, then aq − bp = ±1 (see Continued Fraction).

(α) If aq − bp = 1, the given equation may be written

$$ax - by = c\,(aq - bp);$$
$$\therefore a\,(x - cq) = b\,(y - cp).$$

Since a and b are prime to one another, then x − cq must be divisible by b and y − cp by a; hence

$$(x - cq) / b = (y - cq) / a = t.$$

That is, x = bt + cq and y = at + cp.

Positive integral solutions, unlimited in number, are obtained by giving t any positive integral value, and any negative integral value, so long as it is numerically less than the smaller of the quantities cq/b, cp/a; t may also be zero.

(β) If aq − bp = −1, we obtain x = bt − cq, y = at − cp, from which positive integral solutions, again unlimited in number, are obtained by giving t any positive integral value which exceeds the greater of the two quantities cq/b, cp/a.

If a or b is unity, a/b cannot be converted into a continued fraction with unit numerators, and the above method fails. In this case the solutions can be derived directly, for if b is unity, the equation may be written y = ax − c, and solutions are obtained by giving x positive integral values greater than c/a.

4. To solve ax + by = c in positive integers. Converting a b into a continued fraction and proceeding as before, we obtain, in the case of aq − bp = 1,

$$x = cq - bt,\ y = at - cp.$$

Positive integral solutions are obtained by giving t positive integral values not less than cp/a and not greater than cq/b.

In this case the number of solutions is limited. If aq − bp = −1 we obtain the general solution x = bt − cq, y = cp − at, which is of the same form as in the preceding case. For the determination of the number of solutions the reader is referred to H.S. Hall and S.R. Knight's *Higher Algebra*, G. Chrystal's *Algebra*, and other text-books.

5. If an equation were proposed involving three unknown quantities, as ax + by + cz = d, by transposition we have ax + by = d − cz, and, putting d − cz = c′, ax + by = c′. From this last equation we may find values of x and y of this form,

$$x = mr + nc', \; y = mr + n'c',$$
$$\text{or } x = mr + n(d - cz), \; y = m'r + n'(d - cz);$$

where z and r may be taken at pleasure, except in so far as the values of x, y, z may be required to be all positive; for from such restriction the values of z and r may be confined within certain limits to be determined from the given equation. For more advanced treatment of linear indeterminate equations see COMBINATORIAL ANALYSIS.

6. We proceed to indeterminate problems of the second degree: limiting ourselves to the consideration of the formula $y^2 = a + bx + cx^2$, where x is to be found, so that y may be a rational quantity. The possibility of rendering the proposed formula a square depends altogether upon the coefficients a, b, c; and there are four cases of the problem, the solution of each of which is connected with some peculiarity in its nature.

Case 1. Let a be a square number; then, putting g^2 for a, we have $y^2 = g^2 + bx + cx^2$. Suppose $\sqrt{(g^2 + bx + cx^2)} = g + mx$; then $g^2 + bx + cx^2 = g^2 + 2gmx + m^2x^2$, or $bx + cx^2 = 2gmx + m^2x^2$, that is, $b + cx = 2gm + m^2x$; hence

$$x = \frac{2gm - b}{c - m^2}, \; y = \sqrt{(g^2 + bx + cx^2)} = \frac{cg - bm + gm^2}{c - m^2}.$$

Case 2. Let c be a square number $= g^2$; then, putting $\sqrt{(a + bx + g^2x^2)} = m + gx$, we find $a + bx + g^2x^2 = m^2 + 2mgx + g^2x^2$, or $a + bx = m^2 + 2mgx$; hence we find

$$x = \frac{m^2 - a}{b - 2mg}, \; y = \sqrt{(a + bx + g^2x^2)} = \frac{bm - gm^2 - ag}{b - 2mg}.$$

Case 3. When neither a nor c is a square number, yet if the expression $a + bx + cx^2$ can be resolved into two simple factors, as $f + gx$ and $h + kx$, the irrationality may be taken away as follows:—

Assume $\sqrt{(a + bx + cx^2)} = \sqrt{\{(f + gx)(h + kx)\}} = m(f + gx)$, then $(f + gx)(h + kx) = m^2(f + gx)^2$, or $h + kx = m^2(f + gx)$; hence we find

$$x = \frac{fm^2 - h}{k - gm^2}, \; y = \sqrt{\{(f + gx)(h + kx)\}} = \frac{(fk - gh)\,m}{k - gm^2};$$

and in all these formulae m may be taken at pleasure.

Case 4. The expression $a + bx + cx^2$ may be transformed into a square as often as it can be resolved into two parts, one of which is a complete square, and the other a product of two simple factors; for then it has this form, $p^2 + qr$, where p, q and r are quantities which contain no power of x higher than the first. Let us assume $\sqrt{(p^2 + qr)} = p + mq$; thus we have $p^2 + qr = p^2 + 2mpq + m^2q^2$ and $r = 2mp + m^2q$, and as this equation involves only the first power of x, we may by proper reduction obtain from it rational values of x and y, as in the three foregoing cases.

The application of the preceding general methods of resolution to any particular case is very easy; we shall therefore conclude with a single example.

Ex. It is required to find two square numbers whose sum is a given square number.

Let a^2 be the given square number, and x^2, y^2 the numbers required; then, by the question, $x^2 + y^2 = a^2$, and $y = \sqrt{(a^2 - x^2)}$. This equation is evidently of such a form as to be resolvable by the method employed in case 1. Accordingly, by comparing $\sqrt{(a^2 - x^2)}$ with the general expression $\sqrt{(g^2 + bx + cx^2)}$, we have $g = a$, $b = 0$, $c = -1$, and substituting these values in the formulae, and also $-n$ for $+m$, we find

$$x = \frac{2an}{n^2 + 1}, \; y = \frac{a(n^2 - 1)}{n^2 + 1}.$$

If $a = n^2 + 1$, there results $x = 2n$, $y = n^2 - 1$, $a = n^2 + 1$. Hence if r be an even number, the three sides of a rational right-angled triangle are r, $(\tfrac{1}{2}\,r)^2 - 1$, $(\tfrac{1}{2}\,r)^2 + 1$. If r be an odd number, they become (dividing by 2) r, $\tfrac{1}{2}(r^2 - 1)$, $\tfrac{1}{2}(r^2 + 1)$.

For example, if $r = 4$, $4, 4 - 1, 4 + 1$, or 4, 3, 5, are the sides of a right-angled triangle; if $r = 7$, 7, 24, 25 are the sides of a right-angled triangle.

III. *Cubic Equations*.

1. Cubic equations, like all equations above the first degree, are divided into two classes: they are said to be *pure* when they contain only one power of the unknown quantity; and *adfected* when they contain two or more powers of that quantity.

Pure cubic equations are therefore of the form $x^3 = r$; and hence it appears that a value of the simple power of the unknown quantity may always be found without difficulty, by extracting the cube root of each side of the equation. Let us consider the equation $x^3 - c^3 = 0$ more fully. This is decomposable into the factors $x - c = 0$ and $x^2 + cx + c^2 = 0$. The roots of this quadratic equation are $\tfrac{1}{2}(-1 \pm \sqrt{-3})\,c$, and we see that the equation $x^3 = c^3$ has three roots, namely, one real root c, and two imaginary roots $\tfrac{1}{2}(-1 \pm \sqrt{-3})\,c$. By making c equal to unity, we observe that $\tfrac{1}{2}(-1 \pm \sqrt{-3})$ are the imaginary cube roots of unity, which are generally denoted by ω and ω^2, for it is easy to show that $(\tfrac{1}{2}(-1 - \sqrt{-3}))^2 = \tfrac{1}{2}(-1 + \sqrt{-3})$.

2. Let us now consider such cubic equations as have all their terms, and which are therefore of this

form,

$$x^3 + Ax^2 + Bx + C = 0,$$

where A, B and C denote known quantities, either positive or negative.

This equation may be transformed into another in which the second term is wanting by the substitution $x = y - A/3$. This transformation is a particular case of a general theorem. Let $x^n + Ax^{n-1} + Bx^{n-2} \ldots = 0$. Substitute $x = y + h$; then $(y + h)^n + A(y + h)^{n-1} \ldots = 0$. Expand each term by the binomial theorem, and let us fix our attention on the coefficient of y^{n-1}. By this process we obtain $0 = y^n + y^{n-1}(A + nh)$ + terms involving lower powers of y.

Now h can have any value, and if we choose it so that $A + nh = 0$, then the second term of our derived equation vanishes.

Resuming, therefore, the equation $y^3 + qy + r = 0$, let us suppose $y = v + z$; we then have $y^3 = v^3 + z^3 + 3vz(v + z) = v^3 + z^3 + 3vzy$, and the original equation becomes $v^3 + z^3 + (3vz + q)y + r = 0$. Now v and z are any two quantities subject to the relation $y = v + z$, and if we suppose $3vz + q = 0$, they are completely determined. This leads to $v^3 + z^3 + r = 0$ and $3vz + q = 0$. Therefore v^3 and z^3 are the roots of the quadratic $t^2 + rt - q^2/27 = 0$. Therefore

$$\begin{aligned} v^3 &= -\tfrac{1}{2}r + \sqrt{(\tfrac{1}{27}q^3 + \tfrac{1}{4}r^2)};\ z^3 = -\tfrac{1}{2}r - \sqrt{(\tfrac{1}{27}q^3 + \tfrac{1}{4}r^2)};\\ v &= \sqrt[3]{\{-\tfrac{1}{2}r + \sqrt{(\tfrac{1}{27}q^3 + \tfrac{1}{4}r^2)}\}};\ z = \sqrt[3]{\{(-\tfrac{1}{2}r - \sqrt{(\tfrac{1}{27}q^3 + \tfrac{1}{4}r^2)}\}};\\ \text{and } y &= v + z = \sqrt[3]{\{-\tfrac{1}{2}r + \sqrt{(\tfrac{1}{27}q^3 + \tfrac{1}{4}r^2)}\}} + \sqrt[3]{\{-\tfrac{1}{2}r - \sqrt{(\tfrac{1}{27}q^3 + \tfrac{1}{4}r^2)}\}}. \end{aligned}$$

Thus we have obtained a value of the unknown quantity y, in terms of the known quantities q and r; therefore the equation is resolved.

3. But this is only one of three values which y may have. Let us, for the sake of brevity, put

$$A = -\tfrac{1}{2}r + \sqrt{(\tfrac{1}{27}q^3 + \tfrac{1}{4}r^2)},\ B = -\tfrac{1}{2}r - \sqrt{(\tfrac{1}{27}q^3 + \tfrac{1}{4}r^2)},$$

$$\begin{aligned} \text{and put}\quad \alpha &= \tfrac{1}{2}(-1 + \sqrt{-3}),\\ \beta &= \tfrac{1}{2}(-1 - \sqrt{-3}). \end{aligned}$$

Then, from what has been shown (§ 1), it is evident that v and z have each these three values,

$$\begin{aligned} v &= \sqrt[3]{A},\ v = \alpha\sqrt[3]{A},\ v = \beta\sqrt[3]{A};\\ z &= \sqrt[3]{B},\ z = \alpha\sqrt[3]{B},\ z = \beta\sqrt[3]{B}. \end{aligned}$$

To determine the corresponding values of v and z, we must consider that $vz = -\tfrac{1}{3}q = \sqrt[3]{(AB)}$. Now if we observe that $\alpha\beta = 1$, it will immediately appear that $v + z$ has these three values,

$$\begin{aligned} v + z &= \sqrt[3]{A} + \sqrt[3]{B},\\ v + z &= \alpha\sqrt[3]{A} + \beta\sqrt[3]{B},\\ v + z &= \beta\sqrt[3]{A} + \alpha\sqrt[3]{B}, \end{aligned}$$

which are therefore the three values of y.

The first of these formulae is commonly known by the name of Cardan's rule (see Algebra: *History*). 712

The formulae given above for the roots of a cubic equation may be put under a different form, better adapted to the purposes of arithmetical calculation, as follows:—Because $vz = -\tfrac{1}{3}q$, therefore $z = -\tfrac{1}{3}q \times 1/v = -\tfrac{1}{3}q / \sqrt[3]{A}$; hence $v + z = \sqrt[3]{A} - \tfrac{1}{3}q / \sqrt[3]{A}$: thus it appears that the three values of y may also be expressed thus:

$$\begin{aligned} y &= \sqrt[3]{A} - \tfrac{1}{3}q / \sqrt[3]{A}\\ y &= \alpha\sqrt[3]{A} - \tfrac{1}{3}q\beta / \sqrt[3]{A}\\ y &= \beta\sqrt[3]{A} - \tfrac{1}{3}q\alpha / \sqrt[3]{A}. \end{aligned}$$

See below, *Theory of Equations*, §§ 16 et seq.

IV. *Biquadratic Equations*.

1. When a biquadratic equation contains all its terms, it has this form,

$$x^4 + Ax^3 + Bx^2 + Cx + D = 0,$$

where A, B, C, D denote known quantities.

We shall first consider pure biquadratics, or such as contain only the first and last terms, and therefore are of this form, $x^4 = b^4$. In this case it is evident that x may be readily had by two extractions of the square root; by the first we find $x^2 = b^2$, and by the second $x = b$. This, however, is only one of the values which x may have; for since $x^4 = b^4$, therefore $x^4 - b^4 = 0$; but $x^4 - b^4$ may be resolved into two factors $x^2 - b^2$ and $x^2 + b^2$, each of which admits of a similar resolution; for $x^2 - b^2 = (x - b)(x + b)$ and $x^2 + b^2 = (x - b\sqrt{-1})(x + b\sqrt{-1})$. Hence it appears that the equation $x^4 - b^4 = 0$ may also be expressed thus,

$$(x - b)(x + b)(x - b\sqrt{-1})(x + b\sqrt{-1}) = 0;$$

so that x may have these four values,

$$+b, \qquad -b, \qquad +b\sqrt{-1}, \qquad -b\sqrt{-1},$$

two of which are real, and the others imaginary.

2. Next to pure biquadratic equations, in respect of easiness of resolution, are such as want the second and fourth terms, and therefore have this form,

$$x^4 + qx^2 + s = 0.$$

These may be resolved in the manner of quadratic equations; for if we put $y = x^2$, we have

$$y^2 + qy + s = 0,$$

from which we find $y = \frac{1}{2} \{-q \pm \sqrt{(q^2 - 4s)} \}$, and therefore

$$x = \pm\sqrt{\tfrac{1}{2}} \{-q \pm \sqrt{(q^2 - 4s)} \}.$$

3. When a biquadratic equation has all its terms, its resolution may be always reduced to that of a cubic equation. There are various methods by which such a reduction may be effected. The following was first given by Leonhard Euler in the *Petersburg Commentaries*, and afterwards explained more fully in his *Elements of Algebra*.

We have already explained how an equation which is complete in its terms may be transformed into another of the same degree, but which wants the second term; therefore any biquadratic equation may be reduced to this form,

$$y^4 + py^2 + qy + r = 0,$$

where the second term is wanting, and where p, q, r denote any known quantities whatever.

That we may form an equation similar to the above, let us assume $y = \sqrt{a} + \sqrt{b} + \sqrt{c}$, and also suppose that the letters a, b, c denote the roots of the cubic equation

$$z^3 + Pz^2 + Qz - R = 0;$$

then, from the theory of equations we have

$$a + b + c = -P, \qquad ab + ac + bc = Q, \qquad abc = R.$$

We square the assumed formula

$$y = \sqrt{a} + \sqrt{b} + \sqrt{c},$$

and obtain $y^2 = a + b + c + 2(\sqrt{ab} + \sqrt{ac} + \sqrt{bc});$

or, substituting $-P$ for $a + b + c$, and transposing,

$$y^2 + P = 2(\sqrt{ab} + \sqrt{ac} + \sqrt{bc}).$$

Let this equation be also squared, and we have

$$y^4 + 2Py^2 + P^2 = 4\,(ab + ac + bc) + 8\,(\sqrt{a^2bc} + \sqrt{ab^2c} + \sqrt{abc^2});$$

and since $ab + ac + bc = Q,$

and $\sqrt{a^2bc} + \sqrt{ab^2c} + \sqrt{abc^2} = \sqrt{abc}\,(\sqrt{a} + \sqrt{b} + \sqrt{c}) = \sqrt{R}\cdot y,$

the same equation may be expressed thus:

$$y^4 + 2Py^2 + P^2 = 4Q + 8\sqrt{R}\cdot y.$$

Thus we have the biquadratic equation

$$y^4 + 2Py^2 - 8\sqrt{R}\cdot y + P^2 - 4Q = 0,$$

one of the roots of which is $y = \sqrt{a} + \sqrt{b} + \sqrt{c}$, while a, b, c are the roots of the cubic equation $z^3 + Pz^2 + Qz - R = 0$.

4. In order to apply this resolution to the proposed equation $y^4 + py^2 + qy + r = 0$, we must express the assumed coefficients P, Q, R by means of p, q, r, the coefficients of that equation. For this purpose let us compare the equations

$$y^4 + py^2 + qy + r = 0,$$
$$y^4 + 2Py^2 - 8\sqrt{R}y + P^2 - 4Q = 0,$$

and it immediately appears that

$$2P = p, \qquad -8\sqrt{R} = q, \qquad P^2 - 4Q = r;$$

and from these equations we find

$$P = \tfrac{1}{2}\,p, \qquad Q = \tfrac{1}{16}\,(p^2 - 4r), \qquad R = \tfrac{1}{64}\,q^2.$$

Hence it follows that the roots of the proposed equation are generally expressed by the formula

$$y = \sqrt{a} + \sqrt{b} + \sqrt{c};$$

where a, b, c denote the roots of this cubic equation,

$$z^3 + \frac{p}{1}\,z^2 + \frac{p^2 - 4r}{1}\,z - \frac{q^2}{1} = 0.$$

But to find each particular root, we must consider, that as the square root of a number may be either positive or negative, so each of the quantities √a, √b, √c may have either the sign + or − prefixed to it; and hence our formula will give eight different expressions for the root. It is, however, to be observed, that as the product of the three quantities √a, √b, √c must be equal to √R or to $-\frac{1}{8}$ q; when q is positive, their product must be a negative quantity, and this can only be effected by making either one or three of them negative; again, when q is negative, their product must be a positive quantity; so that in this case they must either be all positive, or two of them must be negative. These considerations enable us to determine that four of the eight expressions for the root belong to the case in which q is positive, and the other four to that in which it is negative.

5. We shall now give the result of the preceding investigation in the form of a practical rule; and as the coefficients of the cubic equation which has been found involve fractions, we shall transform it into another, in which the coefficients are integers, by supposing z = ¼ v. Thus the equation

$$z^3 + \frac{p}{2} z^2 + \frac{p^2 - 4r}{16} z - \frac{q^2}{64} = 0$$

becomes, after reduction,

$$v^3 + 2pv^2 + (p^2 - 4r)\, v - q^2 = 0;$$

it also follows, that if the roots of the latter equation are a, b, c, the roots of the former are ¼ a, ¼ b, ¼ c, so that our rule may now be expressed thus:

Let $y^4 + py^2 + qy + r = 0$ be any biquadratic equation wanting its second term. Form this cubic equation

$$v^3 + 2pv^2 + (p^2 - 4r)\, v - q^2 = 0,$$

and find its roots, which let us denote by a, b, c.

Then the roots of the proposed biquadratic equation are,

when q is negative,	when q is positive,
y = ½ (√a + √b + √c),	y = ½ (−√a − √b − √c),
y = ½ (√a − √b − √c),	y = ½ (−√a + √b + √c),
y = ½ (−√a + √b − √c),	y = ½ (√a − √b + √c),
y = ½ (−√a − √b + √c),	y = ½ (√a + √b − √c).

See also below, *Theory of Equations*, § 17 et seq.

(X.)

V. *Theory of Equations*.

1. In the subject “Theory of Equations” the term *equation* is used to denote an equation of the form $x^n - p_1 x^{n-1} \ldots \pm p_n = 0$, where p_1, p_2 ... p_n are regarded as known, and x as a quantity to be determined; for shortness the equation is written $f(x) = 0$.

The equation may be *numerical*; that is, the coefficients p_1, $p_2{}^n$, ... p_n are then numbers—understanding by number a quantity of the form α + βi (α and β having any positive or negative real values whatever, or say each of these is regarded as susceptible of continuous variation from an indefinitely large negative to an indefinitely large positive value), and i denoting √−1.

Or the equation may be *algebraical*; that is, the coefficients are not then restricted to denote, or are not explicitly considered as denoting, numbers.

1. We consider first numerical equations. (Real theory, 2-6; Imaginary theory, 7-10.)

Real Theory.

2. Postponing all consideration of imaginaries, we take in the first instance the coefficients to be real, and attend only to the real roots (if any); that is, p_1, p_2, ... p_n are real positive or negative quantities, and a root a, if it exists, is a positive or negative quantity such that $a^n - p_1 a^{n-1} \ldots \pm p_n = 0$, or say, $f(a) = 0$.

It is very useful to consider the curve $y = f(x)$,—or, what would come to the same, the curve $Ay = f(x)$,—but it is better to retain the first-mentioned form of equation, drawing, if need be, the ordinate y on a reduced scale. For instance, if the given equation be $x^3 - 6x^2 + 11x - 6.06 = 0$,[1] then the curve $y = x^3 - 6x^2 + 11x - 6.06$ is as shown in fig. 1, without any reduction of scale for the ordinate. 713

It is clear that, in general, y is a continuous one-valued function of x, finite for every finite value of x, but becoming infinite when x is infinite; *i.e.*, assuming throughout that the coefficient of x^n is +1, then when $x = \infty$, $y = +\infty$; but when $x = -\infty$, then $y = +\infty$ or $-\infty$, according as n is even or odd; the curve cuts any line whatever, and in particular it cuts the axis (of x) in at most n points; and the value of x, at any point of intersection with the axis, is a root of the equation $f(x) = 0$.

If β, α are any two values of x (α > β, that is, α nearer +∞), then if f(β), f(α) have opposite signs, the curve cuts the axis an odd number of times, and therefore at least once, between the points x = β, x = α; but if f(β), f(α) have the same sign, then between these points the curve cuts the axis an even number of times, or it may be not at all. That is, f(β), f(α) having opposite signs, there are between the limits β, α an odd number of real roots, and therefore at least one real root; but f(β), f(α) having the same sign, there are between these limits an even number of real roots, or it may be there is no real root. In particular, by giving to β, α the values -∞, +∞ (or, what is the same thing, any two values sufficiently near to these values respectively) it appears that an equation of an odd order has always an odd number of real roots, and therefore at least one real root; but that an equation of an even order has an even number of real roots, or it may be no real root.

If α be such that for x = or > a (that is, x nearer to +∞) f(x) is always +, and β be such that for x = or < β (that is, x nearer to −∞) f(x) is always −, then the real roots (if any) lie between these limits x = β, x = α; and it is easy to find by trial such two limits including between them all the real roots (if any).

3. Suppose that the positive value δ is an inferior limit to the difference between two real roots of the equation; or rather (since the foregoing expression would imply the existence of real roots) suppose that there are not two real roots such that their difference taken positively is = or < δ; then, γ being any value whatever, there is clearly at most one real root between the limits γ and γ + δ; and by what precedes there is such real root or there is not such real root, according as f(γ), f(γ + δ) have opposite signs or have the same sign. And by dividing in this manner the interval β to α into intervals each of which is = or < δ, we should not only ascertain the number of the real roots (if any), but we should also *separate* the real roots, that is, find for each of them limits γ, γ + δ between which there lies this one, and only this one, real root.

> In particular cases it is frequently possible to ascertain the number of the real roots, and to effect their separation by trial or otherwise, without much difficulty; but the foregoing was the general process as employed by Joseph Louis Lagrange even in the second edition (1808) of the *Traité de la résolution des équations numériques*;[2] the determination of the limit δ had to be effected by means of the "equation of differences" or equation of the order ½ n(n − 1), the roots of which are the squares of the differences of the roots of the given equation, and the process is a cumbrous and unsatisfactory one.

4. The great step was effected by the theorem of J.C.F. Sturm (1835)—viz. here starting from the function f(x), and its first derived function f′(x), we have (by a process which is a slight modification of that for obtaining the greatest common measure of these two functions) to form a series of functions

$$f(x), f'(x), f_2(x), \ldots f_n(x)$$

of the degrees n, n − 1, n − 2 ... 0 respectively,—the last term $f_n(x)$ being thus an absolute constant. These lead to the immediate determination of the number of real roots (if any) between any two given limits β, α; viz. supposing α > β (that is, α nearer to +∞), then substituting successively these two values in the series of functions, and attending only to the signs of the resulting values, the number of the changes of sign lost in passing from β to α is the required number of real roots between the two limits. In particular, taking β, α = −∞, +∞ respectively, the signs of the several functions depend merely on the signs of the terms which contain the highest powers of x, and are seen by inspection, and the theorem thus gives at once the whole number of real roots.

And although theoretically, in order to complete by a finite number of operations the separation of the real roots, we still need to know the value of the before-mentioned limit δ; yet in any given case the separation may be effected by a limited number of repetitions of the process. The practical difficulty is when two or more roots are very near to each other. Suppose, for instance, that the theorem shows that there are two roots between 0 and 10; by giving to x the values 1, 2, 3, ... successively, it might appear that the two roots were between 5 and 6; then again that they were between 5.3 and 5.4, then between 5.34 and 5.35, and so on until we arrive at a separation; say it appears that between 5.346 and 5.347 there is one root, and between 5.348 and 5.349 the other root. But in the case in question δ would have a very small value, such as .002, and even supposing this value known, the direct application of the first-mentioned process would be still more laborious.

5. Supposing the separation once effected, the determination of the single real root which lies between the two given limits may be effected to any required degree of approximation either by the processes of W.G. Horner and Lagrange (which are in principle a carrying out of the method of Sturm's theorem), or by the process of Sir Isaac Newton, as perfected by Joseph Fourier (which requires to be separately considered).

> First as to Horner and Lagrange. We know that between the limits β, α there lies one, and only one, real root of the equation; f(β) and f(α) have therefore opposite signs. Suppose any intermediate value is θ; in order to determine by Sturm's theorem whether the root lies between β, θ, or between θ, α, it would be quite unnecessary to calculate the signs of f(θ), f′(θ), $f_2(\theta)$ ...; only the sign of f(θ) is required; for, if this has the same sign as f(β), then the root is between β, θ; if the same sign as f(α), then the root is between θ, α. We want to make θ increase from the inferior limit β, at which f(θ) has the sign of f(β), so long as f(θ) retains this sign, and then to a value for which it assumes the opposite sign; we have thus two nearer limits of the required root, and the process may be repeated indefinitely.
>
> Horner's method (1819) gives the root as a decimal, figure by figure; thus if the equation be known

to have one real root between 0 and 10, it is in effect shown say that 5 is too small (that is, the root is between 5 and 6); next that 5.4 is too small (that is, the root is between 5.4 and 5.5); and so on to any number of decimals. Each figure is obtained, not by the successive trial of all the figures which precede it, but (as in the ordinary process of the extraction of a square root, which is in fact Horner's process applied to this particular case) it is given presumptively as the first figure of a quotient; such value may be too large, and then the next inferior integer must be tried instead of it, or it may require to be further diminished. And it is to be remarked that the process not only gives the approximate value α of the root, but (as in the extraction of a square root) it includes the calculation of the function $f(\alpha)$, which should be, and approximately is, = 0. The arrangement of the calculations is very elegant, and forms an integral part of the actual method. It is to be observed that after a certain number of decimal places have been obtained, a good many more can be found by a mere division. It is in the progress tacitly assumed that the roots have been first separated.

Lagrange's method (1767) gives the root as a continued fraction a + 1/b + 1/c + ..., where a is a positive or negative integer (which may be = 0), but b, c, ... are positive integers. Suppose the roots have been separated; then (by trial if need be of consecutive integer values) the limits may be made to be consecutive integer numbers: say they are a, a + 1; the value of x is therefore = a + 1/y, where y is positive and greater than 1; from the given equation for x, writing therein x = a + 1/y, we form an equation of the same order for y, and this equation will have one, and only one, positive root greater than 1; hence finding for it the limits b, b + 1 (where b is = or > 1), we have y = b + 1/z, where z is positive and greater than 1; and so on—that is, we thus obtain the successive denominators b, c, d ... of the continued fraction. The method is theoretically very elegant, but the disadvantage is that it gives the result in the form of a continued fraction, which for the most part must ultimately be converted into a decimal. There is one advantage in the method, that a commensurable root (that is, a root equal to a rational fraction) is found accurately, since, when such root exists, the continued fraction terminates.

6. Newton's method (1711), as perfected by Fourier(1831), may be roughly stated as follows. If x = γ be an approximate value of any root, and γ + h the correct value, then $f(\gamma + h) = 0$, that is,

$$f(\gamma) + \frac{h}{1} f'(\gamma) + \frac{h^2}{1\cdot 2} f''(\gamma) + \ldots = 0;$$

and then, if h be so small that the terms after the second may be neglected, $f(\gamma) + hf'(\gamma) = 0$, that is, $h = \{-f(\gamma)/f'(\gamma)\}$, or the new approximate value is $x = \gamma - \{f(\gamma)/f'(\gamma)\}$; and so on, as often as we please. It will be observed that so far nothing has been assumed as to the separation of the roots, or even as to the existence of a real root; γ has been taken as the approximate value of a root, but no precise meaning has been attached to this expression. The question arises, What are the conditions to be satisfied by γ in order that the process may by successive repetitions actually lead to a certain real root of the equation; or that, γ being an approximate value of a certain real root, the new value $\gamma - \{f(\gamma)/f'(\gamma)\}$ may be a more approximate value.

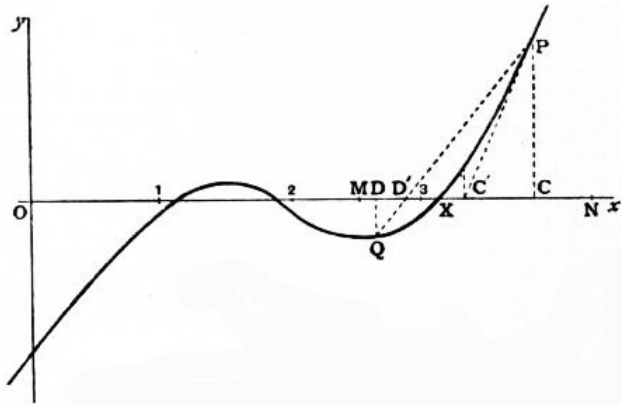

FIG. 1.

Referring to fig. 1, it is easy to see that if OC represent the assumed value γ, then, drawing the ordinate CP to meet the curve in P, and the tangent PC′ to meet the axis in C′, we shall have OC′ as the new approximate value of the root. But observe that there is here a real root OX, and that the curve beyond X is convex to the axis; under these conditions the point C′ is nearer to X than was C; and, starting with C′ instead of C, and proceeding in like manner to draw a new ordinate and tangent, and so on as often as we please, we approximate continually, and that with great rapidity, to the true value OX. But if C had been taken on the other side of X, where the curve is concave to the axis, the new point C′ might or might not be nearer to X than was the point C; and in this case the method, if it succeeds at all, does so by accident only, *i.e.* it may happen that C′ or some subsequent point comes to be a point C, such that CO is a *proper* approximate value of the root, and then the subsequent approximations proceed in the same manner as if this value had been assumed in the first instance, all the preceding work being wasted. It thus appears that for the proper application of the method we require *more* than the mere separation of the roots. In order to be able to approximate to a certain root α, = OX, we require to know that, between OX and some value ON, the curve is always convex to the axis (analytically, between the two values, $f(x)$ and $f''(x)$ must have always the same sign). When this is so, the point C may be taken anywhere on the proper side of X, and within the portion XN of the axis; and the process is then the one already explained. The approximation is in general a very

rapid one. If we know for the required root OX the two limits OM, ON such that from M to X the curve is always *concave* to the axis, while from X to N it is always convex to the axis,—then, taking D anywhere in the portion MX and (as before) C in the portion XN, drawing the ordinates DQ, CP, and joining the points P, Q by a line which meets the axis in D′, also constructing the point C′ by means of the tangent at P as before, we have for the required root the new limits OD′, OC′; and proceeding in like manner with the points D′, C′, and so on as often as we please, we obtain at each step two limits approximating more and more nearly to the required root OX. The process as to the point D′, translated into analysis, is the ordinate process of interpolation. Suppose OD = β, OC = α, we have approximately $f(\beta + h) = f(\beta) + h\{f(\alpha) - f(\beta)\} / (\alpha - \beta)$, whence if the root is β + h then $h = -(\alpha - \beta)f(\beta) / \{f(\alpha) - f(\beta)\}$.

Returning for a moment to Horner's method, it may be remarked that the correction h, to an approximate value α, is therein found as a quotient the same or such as the quotient $f(\alpha) \div f'(\alpha)$ which presents itself in Newton's method. The difference is that with Horner the integer part of this quotient is taken as the presumptive value of h, and the figure is verified at each step. With Newton the quotient itself, developed to the proper number of decimal places, is taken as the value of h; if too many decimals are taken, there would be a waste of work; but the error would correct itself at the next step. Of course the calculation should be conducted without any such waste of work.

Imaginary Theory.

7. It will be recollected that the expression *number* and the correlative epithet *numerical* were at the outset used in a wide sense, as extending to imaginaries. This extension arises out of the theory of equations by a process analogous to that by which number, in its original most restricted sense of positive integer number, was extended to have the meaning of a real positive or negative magnitude susceptible of continuous variation.

If for a moment number is understood in its most restricted sense as meaning positive integer number, the solution of a simple equation leads to an extension; $ax - b = 0$ gives $x = b/a$, a positive fraction, and we can in this manner represent, not accurately, but as nearly as we please, any positive magnitude whatever; so an equation $ax + b = 0$ gives $x = -b/a$, which (approximately as before) represents any negative magnitude. We thus arrive at the extended signification of number as a continuously varying positive or negative magnitude. Such numbers may be added or subtracted, multiplied or divided one by another, and the result is always a number. Now from a quadric equation we derive, in like manner, the notion of a complex or imaginary number such as is spoken of above. The equation $x^2 + 1 = 0$ is not (in the foregoing sense, number = real number) satisfied by any numerical value whatever of x; but we assume that there is a number which we call i, satisfying the equation $i^2 + 1 = 0$, and then taking a and b any real numbers, we form an expression such as a + bi, and use the expression number in this extended sense: any two such numbers may be added or subtracted, multiplied or divided one by the other, and the result is always a number. And if we consider first a quadric equation $x^2 + px + q = 0$ where p and q are real numbers, and next the like equation, where p and q are any numbers whatever, it can be shown that there exists for x a numerical value which satisfies the equation; or, in other words, it can be shown that the equation has a numerical root. The like theorem, in fact, holds good for an equation of any order whatever; but suppose for a moment that this was not the case; say that there was a cubic equation $x^3 + px^2 + qx + r = 0$, with numerical coefficients, not satisfied by any numerical value of x, we should have to establish a new imaginary j satisfying some such equation, and should then have to consider numbers of the form a + bj, or perhaps a + bj + cj^2 (a, b, c numbers α + βi of the kind heretofore considered), —first we should be thrown back on the quadric equation $x^2 + px + q = 0$, p and q being now numbers of the last-mentioned extended form—*non constat* that every such equation has a numerical root—and if not, we might be led to *other* imaginaries k, l, &c., and so on *ad infinitum* in inextricable confusion.

But in fact a numerical equation of any order whatever has always a numerical root, and thus numbers (in the foregoing sense, number = quantity of the form α + βi) form (*what real numbers do not*) a universe complete in itself, such that starting in it we are never led out of it. There may very well be, and perhaps are, numbers in a more general sense of the term (quaternions are not a case in point, as the ordinary laws of combination are not adhered to), but in order to have to do with such numbers (if any) we must start with them.

8. The capital theorem as regards numerical equations thus is, every numerical equation has a numerical root; or for shortness (the meaning being as before), every equation has a root. Of course the theorem is the reverse of self-evident, and it requires proof; but provisionally assuming it as true, we derive from it the general theory of numerical equations. As the term root was introduced in the course of an explanation, it will be convenient to give here the formal definition.

A number a such that substituted for x it makes the function $x_1^n - p_1x^{n-1} \ldots \pm p_n$ to be = 0, or say such that it satisfies the equation $f(x) = 0$, is said to be a root of the equation; that is, a being a root, we have

$$a^n - p_1a^{n-1} \ldots \pm p_n = 0, \text{ or say } f(a) = 0;$$

and it is then easily shown that x − a is a factor of the function f(x), viz. that we have $f(x) = (x - a)f_1(x)$, where $f_1(x)$ is a function $x^{n-1} - q_1x^{n-2} \ldots \pm q_{n-1}$ of the order n − 1, with numerical coefficients

$q_1, q_2 \ldots q_{n-1}$.

In general a is not a root of the equation $f_1(x) = 0$, but it may be so—*i.e.* $f_1(x)$ may contain the factor $x - a$; when this is so, $f(x)$ will contain the factor $(x - a)^2$; writing then $f(x) = (x - a)^2 f_2(x)$, and assuming that a is not a root of the equation $f_2(x) = 0$, $x = a$ is then said to be a double root of the equation $f(x) = 0$; and similarly $f(x)$ may contain the factor $(x - a)^3$ and no higher power, and $x = a$ is then a triple root; and so on.

Supposing in general that $f(x) = (x - a)^\alpha F(x)$ (α being a positive integer which may be = 1, $(x - a)^\alpha$ the highest power of $x - a$ which divides $f(x)$, and $F(x)$ being of course of the order $n - \alpha$), then the equation $F(x) = 0$ will have a root b which will be different from a; $x - b$ will be a factor, in general a simple one, but it may be a multiple one, of $F(x)$, and $f(x)$ will in this case be $= (x - a)^\alpha (x - b)^\beta \Phi(x)$ (β a positive integer which may be = 1, $(x - b)^\beta$ the highest power of $x - b$ in $F(x)$ or $f(x)$, and $\Phi(x)$ being of course of the order $n - \alpha - \beta$). The original equation $f(x) = 0$ is in this case said to have α roots each = a, β roots each = b; and so on for any other factors $(x - c)^\gamma$, &c.

We have thus the *theorem*—A numerical equation of the order n has in every case n roots, viz. there exist n numbers, a, b, ... (in general all distinct, but which may arrange themselves in any sets of equal values), such that $f(x) = (x - a)(x - b)(x - c) \ldots$ identically.

If the equation has equal roots, these can in general be determined, and the case is at any rate a special one which may be in the first instance excluded from consideration. It is, therefore, in general assumed that the equation $f(x) = 0$ has all its roots unequal.

If the coefficients $p_1, p_2, \ldots$ are all or any one or more of them imaginary, then the equation $f(x) = 0$, separating the real and imaginary parts thereof, may be written $F(x) + i\Phi(x) = 0$, where $F(x), \Phi(x)$ are each of them a function with real coefficients; and it thus appears that the equation $f(x) = 0$, with imaginary coefficients, has not in general any real root; supposing it to have a real root a, this must be at once a root of each of the equations $F(x) = 0$ and $\Phi(x) = 0$.

But an equation with real coefficients may have as well imaginary as real roots, and we have further the *theorem* that for any such equation the imaginary roots enter in pairs, viz. $\alpha + \beta i$ being a root, then $\alpha - \beta i$ will be also a root. It follows that if the order be odd, there is always an odd number of real roots, and therefore at least one real root.

9. In the case of an equation with real coefficients, the question of the existence of real roots, and of their separation, has been already considered. In the general case of an equation with imaginary (it may be real) coefficients, the like question arises as to the situation of the (real or imaginary) roots; thus, if for facility of conception we regard the constituents α, β of a root $\alpha + \beta i$ as the co-ordinates of a point *in plano*, and accordingly represent the root by such point, then drawing in the plane any closed curve or "contour," the question is how many roots lie within such contour.

This is solved theoretically by means of a theorem of A.L. Cauchy (1837), viz. writing in the original equation $x + iy$ in place of x, the function $f(x + iy)$ becomes $= P + iQ$, where P and Q are each of them a rational and integral function (with real coefficients) of (x, y). Imagining the point (x, y) to travel along the contour, and considering the number of changes of sign from − to + and from + to − of the fraction corresponding to passages of the fraction through zero (that is, to values for which P becomes = 0, disregarding those for which Q becomes = 0), the difference of these numbers gives the number of roots within the contour.

It is important to remark that the demonstration does not presuppose the existence of any root; the contour may be the infinity of the plane (such infinity regarded as a contour, or closed curve), and in this case it can be shown (and that very easily) that the difference of the numbers of changes of sign is = n; that is, there are within the infinite contour, or (what is the same thing) there are in all n roots; thus Cauchy's theorem contains really the proof of the fundamental theorem that a numerical equation of the nth order (not only has a numerical root, but) has precisely n roots. It would appear that this proof of the fundamental theorem in its most complete form is in principle identical with the last proof of K.F. Gauss (1849) of the theorem, in the form—A numerical equation of the nth order has always a root.[3]

But in the case of a finite contour, the actual determination of the difference which gives the number of real roots can be effected only in the case of a rectangular contour, by applying to each of its sides separately a method such as that of Sturm's theorem; and thus the actual determination ultimately depends on a method such as that of Sturm's theorem.

Very little has been done in regard to the calculation of the imaginary roots of an equation by approximation; and the question is not here considered.

10. A class of numerical equations which needs to be considered is that of the binomial equations $x^n - a = 0$ ($a = \alpha + \beta i$, a complex number).

The foregoing conclusions apply, viz. there are always n roots, which, it may be shown, are all unequal. And these can be found numerically by the extraction of the square root, and of an nth root, of *real* numbers, and by the aid of a table of natural sines and cosines.[4] For writing

$$\alpha + \beta i = \sqrt{(\alpha^2 + \beta^2)} \left\{ \frac{\alpha}{\sqrt{(\alpha^2 + \beta^2)}} + \frac{\beta}{\sqrt{(\alpha^2 + \beta^2)}} i \right\},$$

there is always a real angle λ (positive and less than 2π), such that its cosine and sine are $= \alpha / \sqrt{(\alpha^2 + \beta^2)}$ and $\beta / \sqrt{(\alpha^2 + \beta^2)}$ respectively; that is, writing for shortness $\sqrt{(\alpha^2 + \beta^2)} = \rho$, we have $\alpha + \beta i = \rho (\cos$

λ + i sin λ), or the equation is $x^n = \rho (\cos \lambda + i \sin \lambda)$; hence observing that $(\cos \lambda/n + i \sin \lambda/n)^n = \cos \lambda + i \sin \lambda$, a value of x is $= \sqrt[n]{\rho} (\cos \lambda/n + i \sin \lambda/n)$. The formula really gives all the roots, for instead of λ we may write λ + 2sπ, s a positive or negative integer, and then we have

$$x = \sqrt[n]{\rho} \left(\cos \frac{\lambda + 2s\pi}{n} + i \sin \frac{\lambda + 2s\pi}{n} \right),$$

which has the n values obtained by giving to s the values 0, 1, 2 ... n − 1 in succession; the roots are, it is clear, represented by points lying at equal intervals on a circle. But it is more convenient to proceed somewhat differently; taking one of the roots to be θ, so that $\theta^n = a$, then assuming $x = \theta y$, the equation becomes $y^n - 1 = 0$, which equation, like the original equation, has precisely n roots (one of them being of course = 1). And the original equation $x^n - a = 0$ is thus reduced to the more simple equation $x^n - 1 = 0$; and although the theory of this equation is included in the preceding one, yet it is proper to state it separately.

The equation $x^n - 1 = 0$ has its several roots expressed in the form 1, ω, ω², ... ω^{n-1}, where ω may be taken $= \cos 2\pi/n + i \sin 2\pi/n$; in fact, ω having this value, any integer power ω^k is $= \cos 2\pi k/n + i \sin 2\pi k/n$, and we thence have $(\omega^k)^n = \cos 2\pi k + i \sin 2\pi k$, = 1, that is, ω^k is a root of the equation. The theory will be resumed further on.

By what precedes, we are led to the notion (a numerical) of the radical $a^{1/n}$ regarded as an n-valued function; any one of these being denoted by $\sqrt[n]{a}$, then the series of values is $\sqrt[n]{a}$, $\omega\sqrt[n]{a}$, ... $\omega^{n-1}\sqrt[n]{a}$; or we may, if we please, use $\sqrt[n]{a}$ instead of $a^{1/n}$ as a symbol to denote the n-valued function.

As the coefficients of an algebraical equation may be numerical, all which follows in regard to algebraical equations is (with, it may be, some few modifications) applicable to numerical equations; and hence, concluding for the present this subject, it will be convenient to pass on to algebraical equations.

Algebraical Equations.

11. The equation is

$$x^n - p_1 x^{n-1} + \ldots \pm p_n = 0,$$

and we here *assume* the existence of roots, viz. we assume that there are n quantities a, b, c ... (in general all of them different, but which in particular cases may become equal in sets in any manner), such that

$$x^n - p_1 x^{n-1} + \ldots \pm p_n = 0;$$

or looking at the question in a different point of view, and starting with the roots a, b, c ... as given, we express the product of the n factors x − a, x − b, ... in the foregoing form, and thus arrive at an equation of the order n having the n roots a, b, c.... In either case we have

$$p_1 = \Sigma a,\ p_2 = \Sigma ab,\ \ldots\ p_n = abc\ldots;$$

i.e. regarding the coefficients p_1, p_2 ... p_n as given, then we assume the existence of roots a, b, c, ... such that $p_1 = \Sigma a$, &c.; or, regarding the roots as given, then we write p_1, p_2, &c., to denote the functions Σa, Σab, &c.

As already explained, the epithet algebraical is not used in opposition to numerical; an algebraical equation is merely an equation wherein the coefficients are not restricted to denote, or are not explicitly considered as denoting, numbers. That the abstraction is legitimate, appears by the simplest example; in saying that the equation $x^2 - px + q = 0$ has a root $x = \frac{1}{2} \{p + \sqrt{(p^2 - 4q)}\}$, we mean that writing this value for x the equation becomes an identity, $[\frac{1}{2} \{p + \sqrt{(p^2 - 4q)}\}]^2 - p[\frac{1}{2} \{p + \sqrt{(p^2 - 4q)}\}] + q = 0$; and the verification of this identity in nowise depends upon p and q meaning numbers. But if it be asked what there is beyond numerical equations included in the term algebraical equation, or, again, what is the full extent of the meaning attributed to the term—the latter question at any rate it would be very difficult to answer; as to the former one, it may be said that the coefficients may, for instance, be symbols of operation. As regards such equations, there is certainly no proof that every equation has a root, or that an equation of the nth order has n roots; nor is it in any wise clear what the precise signification of the statement is. But it is found that the assumption of the existence of the n roots can be made without contradictory results; conclusions derived from it, if they involve the roots, rest on the same ground as the original assumption; but the conclusion may be independent of the roots altogether, and in this case it is undoubtedly valid; the reasoning, although actually conducted by aid of the assumption (and, it may be, most easily and elegantly in this manner), is really independent of the assumption. In illustration, we observe that it is allowable to express a function of p and q as follows,—that is, by means of a rational symmetrical function of a and b, this can, as a fact, be expressed as a rational function of a + b and ab; and if we prescribe that a + b and ab shall then be changed into p and q respectively, we have the required function of p, q. That is, we have F(α, β) as a representation of f(p, q), obtained as if we had p = a + b, q = ab, but without in any wise assuming the existence of the a, b of these equations.

12. Starting from the equation

$$x^n - p_1 x^{n-1} + \ldots = x - a \cdot x - b.\ \&c.$$

or the equivalent equations $p_1 = \Sigma a$, &c., we find

$$\begin{aligned} a^n - p_1 a^{n-1} + \ldots &= 0, \\ b^n - p_1 b^{n-1} + \ldots &= 0; \\ \cdot \quad \cdot \quad &\cdot \\ \cdot \quad \cdot \quad &\cdot \\ \cdot \quad \cdot \quad &\cdot \end{aligned}$$

(it is as satisfying these equations that a, b ... are said to be the roots of $x^n - p_1 x^{n-1} + \ldots = 0$); and conversely from the last-mentioned equations, assuming that a, b ... are all different, we deduce

$$p_1 = \Sigma a,\ p_2 = \Sigma ab, \text{ &c.}$$

and

$$x^n - p_1 x^{n-1} + \ldots = x - a \cdot x - b. \text{ &c.}$$

Observe that if, for instance, a = b, then the equations $a^n - p_1 a^{n-1} + \ldots = 0$, $b^n - p_1 b^{n-1} + \ldots = 0$ would reduce themselves to a single relation, which would not of itself express that a was a double root,—that is, that $(x - a)^2$ was a factor of $x^n - p_1 x^{n-1}$ +, &c; but by considering b as the limit of a + h, h indefinitely small, we obtain a second equation

$$n a^{n-1} - (n - 1)\, p_1 a^{n-2} + \ldots = 0,$$

which, with the first, expresses that a is a double root; and then the whole system of equations leads as before to the equations $p_1 = \Sigma a$, &c. But the existence of a double root implies a certain relation between the coefficients; the general case is when the roots are all unequal.

We have then the *theorem* that every rational symmetrical function of the roots is a rational function of the coefficients. This is an easy consequence from the less general theorem, every rational and integral symmetrical function of the roots is a rational and integral function of the coefficients.

In particular, the sums of the powers Σa^2, Σa^3, &c., are rational and integral functions of the coefficients.

The process originally employed for the expression of other functions $\Sigma a^\alpha b^\beta$, &c., in terms of the coefficients is to make them depend upon the sums of powers: for instance, $\Sigma a^\alpha b^\beta = \Sigma a^\alpha \Sigma a^\beta - \Sigma a^{\alpha+\beta}$; but this is very objectionable; the true theory consists in showing that we have systems of equations

$$\begin{aligned} p_1 &= \Sigma a, \\ p_2 &= \Sigma ab, \\ p_1^2 &= \Sigma a^2 + 2\Sigma ab, \\ p_3 &= \Sigma abc, \\ p_1 p_2 &= \Sigma a^2 b + 3\Sigma abc, \\ p_1^3 &= \Sigma a^3 + 3\Sigma a^2 b + 6\Sigma abc, \end{aligned}$$

where in each system there are precisely as many equations as there are root-functions on the right-hand side—*e.g.* 3 equations and 3 functions Σabc, $\Sigma a^2 b$, Σa^3. Hence in each system the root-functions can be determined linearly in terms of the powers and products of the coefficients:

$$\begin{aligned} \Sigma ab &= p_2, \\ \Sigma a^2 &= p_1^2 - 2p_2, \\ \Sigma abc &= p_3, \\ \Sigma a^2 b &= p_1 p_2 - 3p_3, \\ \Sigma a^3 &= p_1^3 - 3p_1 p_2 + 3p_3, \end{aligned}$$

and so on. The other process, if applied consistently, would derive the originally assumed value $\Sigma ab = p_2$, from the two equations $\Sigma a = p$, $\Sigma a^2 = p_1^2 - 2p_2$; *i.e.* we have $2\Sigma ab = \Sigma a \cdot \Sigma a - \Sigma a^2$,$= p_1^2 - (p_1^2 - 2p_2)$, $= 2p_2$.

13. It is convenient to mention here the theorem that, x being determined as above by an equation of the order n, any rational and integral function whatever of x, or more generally any rational function which does not become infinite in virtue of the equation itself, can be expressed as a rational and integral function of x, of the order $n - 1$, the coefficients being rational functions of the coefficients of the equation. Thus the equation gives x^n a function of the form in question; multiplying each side by x, and on the right-hand side writing for x^n its foregoing value, we have x^{n+1}, a function of the form in question; and the like for any higher power of x, and therefore also for any rational and integral function of x. The proof in the case of a rational non-integral function is somewhat more complicated. The final result is of the form $\varphi(x)/\psi(x) = I(x)$, or say $\varphi(x) - \psi(x)I(x) = 0$, where φ, ψ, I are rational and integral functions; in other words, this equation, being true if only $f(x) = 0$, can only be so by reason that the left-hand side contains $f(x)$ as a factor, or we must have identically $\varphi(x) - \psi(x)I(x) = M(x)f(x)$. And it is, moreover, clear that the equation $\varphi(x)/\psi(x) = I(x)$, being satisfied if only

$f(x) = 0$, must be satisfied by each root of the equation.

From the theorem that a rational symmetrical function of the roots is expressible in terms of the coefficients, it at once follows that it is possible to determine an equation (of an assignable order) having for its roots the several values of any given (unsymmetrical) function of the roots of the given equation. For example, in the case of a quartic equation, roots (a, b, c, d), it is possible to find an equation having the roots ab, ac, ad, bc, bd, cd (being therefore a sextic equation): viz. in the product

$$(y - ab)\,(y - ac)\,(y - ad)\,(y - bc)\,(y - bd)\,(y - cd)$$

the coefficients of the several powers of y will be symmetrical functions of a, b, c, d and therefore rational and integral functions of the coefficients of the quartic equation; hence, supposing the product so expressed, and equating it to zero, we have the required sextic equation. In the same manner can be found the sextic equation having the roots $(a - b)^2$, $(a - c)^2$, $(a - d)^2$, $(b - c)^2$, $(b - d)^2$, $(c - d)^2$, which is the equation of differences previously referred to; and similarly we obtain the equation of differences for a given equation of any order. Again, the equation sought for may be that having for its n roots the given rational functions $\varphi(a)$, $\varphi(b)$, ... of the several roots of the given equation. Any such rational function can (as was shown) be expressed as a rational and integral function of the order $n - 1$; and, retaining x in place of any one of the roots, the problem is to find y from the equations $x^n - p_1x^{n-1} \ldots = 0$, and $y = M_0x^{n-1} + M_1x^{n-2} + \ldots$, or, what is the same thing, from these two equations to eliminate x. This is in fact E.W. Tschirnhausen's transformation (1683).

14. In connexion with what precedes, the question arises as to the number of values (obtained by permutations of the roots) of given unsymmetrical functions of the roots, or say of a given set of letters: for instance, with roots or letters (a, b, c, d) as before, how many values are there of the function ab + cd, or better, how many functions are there of this form? The answer is 3, viz. ab + cd, ac + bd, ad + bc; or again we may ask whether, in the case of a given number of letters, there exist functions with a given number of values, 3-valued, 4-valued functions, &c.

It is at once seen that for any given number of letters there exist 2-valued functions; the product of the differences of the letters is such a function; however the letters are interchanged, it alters only its sign; or say the two values are Δ and $-\Delta$. And if P, Q are symmetrical functions of the letters, then the general form of such a function is $P + Q\Delta$; this has only the two values $P + Q\Delta$, $P - Q\Delta$.

In the case of 4 letters there exist (as appears above) 3-valued functions: but in the case of 5 letters there does not exist any 3-valued or 4-valued function; and the only 5-valued functions are those which are symmetrical in regard to four of the letters, and can thus be expressed in terms of one letter and of symmetrical functions of all the letters. These last theorems present themselves in the demonstration of the non-existence of a solution of a quintic equation by radicals.

The theory is an extensive and important one, depending on the notions of *substitutions* and of *groups* (*q.v.*).

15. Returning to equations, we have the very important theorem that, given the value of any unsymmetrical function of the roots, *e.g.* in the case of a quartic equation, the function ab + cd, it is in general possible to determine rationally the value of any similar function, such as $(a + b)^3 + (c + d)^3$.

The *a priori* ground of this theorem may be illustrated by means of a numerical equation. Suppose that the roots of a quartic equation are 1, 2, 3, 4, then if it is given that ab + cd = 14, this in effect determines a, b to be 1, 2 and c, d to be 3, 4 (viz. a = 1, b = 2 or a = 2, b = 1, and c = 3, d = 4 or c = 3, d = 4) or else a, b to be 3, 4 and c, d to be 1, 2; and it therefore in effect determines $(a + b)^3 + (c + d)^3$ to be = 370, and not any other value; that is, $(a + b)^3 + (c + d)^3$, as having a single value, must be determinable rationally. And we can in the same way account for cases of failure as regards particular equations; thus, the roots being 1, 2, 3, 4 as before, $a^2b = 2$ determines a to be = 1 and b to be = 2, but if the roots had been 1, 2, 4, 16 then $a^2b = 16$ does not uniquely determine a, b but only makes them to be 1, 16 or 2, 4 respectively.

As to the *a posteriori* proof, assume, for instance,

$$\begin{aligned} t_1 &= ab + cd, & y_1 &= (a + b)^3 + (c + d)^3, \\ t_2 &= ac + bd, & y_2 &= (a + c)^3 + (b + d)^3, \\ t_3 &= ad + bc, & y_3 &= (a + d)^3 + (b + c)^3; \end{aligned}$$

then $y_1 + y_2 + y_3$, $t_1y_1 + t_2y_2 + t_3y_3$, $t_1^2y_1 + t_2^2y_2 + t_3^2y_3$ will be respectively symmetrical functions of the roots of the quartic, and therefore rational and integral functions of the coefficients; that is, they will be known.

Suppose for a moment that t_1, t_2, t_3 are all known; then the equations being linear in y_1, y_2, y_3 these can be expressed rationally in terms of the coefficients and of t_1, t_2, t_3; that is, y_1, y_2, y_3 will be known. But observe further that y_1 is obtained as a function of t_1, t_2, t_3 symmetrical as regards t_2, t_3; it can therefore be expressed as a rational function of t_1 and of $t_2 + t_3$, t_2t_3, and thence as a rational function of t_1 and of $t_1 + t_2 + t_3$, $t_1t_2 + t_1t_3 + t_2t_3$, $t_1t_2t_3$; but these last are symmetrical functions of the roots, and as such they are expressible rationally in terms of the coefficients; that is, y_1 will be expressed as a rational function of t_1 and of the coefficients; or t_1 (alone, not t_2 or t_3) being known, y_1 will be rationally determined.

16. We now consider the question of the algebraical solution of equations, or, more accurately, that of the *solution of equations by radicals*.

In the case of a quadric equation $x^2 - px + q = 0$, we can by the assistance of the sign $\sqrt{(\ )}$ or $(\ )^{1/2}$ find an expression for x as a 2-valued function of the coefficients p, q such that substituting this value in the equation, the equation is thereby identically satisfied; it has been found that this expression is

$$x = \tfrac{1}{2}\{p \pm \sqrt{(p^2 - 4q)}\},$$

and the equation is on this account said to be algebraically solvable, or more accurately solvable by radicals. Or we may by writing $x = -\tfrac{1}{2}p + z$ reduce the equation to $z^2 = \tfrac{1}{4}(p^2 - 4q)$, viz. to an equation of the form $x^2 = a$; and in virtue of its being thus reducible we say that the original equation is solvable by radicals. And the question for an equation of any higher order, say of the order n, is, can we by means of radicals (that is, by aid of the sign $\sqrt[m]{(\ )}$ or $(\ )^{1/m}$, using as many as we please of such signs and with any values of m) find an n-valued function (or any function) of the coefficients which substituted for x in the equation shall satisfy it identically?

It will be observed that the coefficients p, q ... are not explicitly considered as numbers, but even if they do denote numbers, the question whether a numerical equation admits of solution by radicals is wholly unconnected with the before-mentioned theorem of the existence of the n roots of such an equation. It does not even follow that in the case of a numerical equation solvable by radicals the algebraical solution gives the numerical solution, but this requires explanation. Consider first a numerical quadric equation with imaginary coefficients. In the formula $x = \tfrac{1}{2}\{p \pm \sqrt{(p^2 - 4q)}\}$, substituting for p, q their given numerical values, we obtain for x an expression of the form $x = \alpha + \beta i \pm \sqrt{(\gamma + \delta i)}$, where $\alpha, \beta, \gamma, \delta$ are real numbers. This expression substituted for x in the quadric equation would satisfy it identically, and it is thus an algebraical solution; but there is no obvious *a priori* reason why $\sqrt{(\gamma + \delta i)}$ should have a value $= c + di$, where c and d are real numbers calculable by the extraction of a root or roots of real numbers; however the case is (what there was no *a priori* right to expect) that $\sqrt{(\gamma + \delta i)}$ has such a value calculable by means of the radical expressions $\sqrt{\{\sqrt{(\gamma^2 + \delta^2)} \pm \gamma\}}$; and hence the algebraical solution of a numerical quadric equation does in every case give the numerical solution. The case of a numerical cubic equation will be considered presently.

17. A cubic equation can be solved by radicals.

Taking for greater simplicity the cubic in the reduced form $x^3 + qx - r = 0$, and assuming $x = a + b$, this will be a solution if only $3ab = q$ and $a^3 + b^3 = r$, equations which give $(a^3 - b^3)^2 = r^2 - \tfrac{4}{27}q^3$, a quadric equation solvable by radicals, and giving $a^3 - b^3 = \sqrt{(r^2 - \tfrac{4}{27}q^3)}$, a 2-valued function of the coefficients: combining this with $a^3 + b^3 = r$, we have $a^3 = \tfrac{1}{2}\{r + \sqrt{(r^2 - \tfrac{4}{27}q^3)}\}$, a 2-valued function: we then have a by means of a cube root, viz.

$$a = \sqrt[3]{[\tfrac{1}{2}\{r + \sqrt{(r^2 - \tfrac{4}{27}q^3)}\}]},$$

a 6-valued function of the coefficients; but then, writing $q = b/3a$, we have, as may be shown, $a + b$ a 3-valued function of the coefficients; and $x = a + b$ is the required solution by radicals. It would have been wrong to complete the solution by writing

$$b = \sqrt[3]{[\tfrac{1}{2}\{r - \sqrt{(r^2 - \tfrac{4}{27}q^3)}\}]},$$

for then $a + b$ would have been given as a 9-valued function having only 3 of its values roots, and the other 6 values being irrelevant. Observe that in this last process we make no use of the equation $3ab = q$, in its original form, but use only the derived equation $27a^3b^3 = q^3$, implied in, but not implying, the original form.

An interesting variation of the solution is to write $x = ab(a + b)$, giving $a^3b^3(a^3 + b^3) = r$ and $3a^3b^3 = q$, or say $a^3 + b^3 = 3r/q$, $a^3b^3 = \tfrac{1}{3}q$; and consequently

$$a^3 = \frac{\tfrac{3}{2}}{q}\{r + \sqrt{(r^2 - \tfrac{4}{27}q^3)}\},\ b^3 = \frac{\tfrac{3}{2}}{q}\{r - \sqrt{(r^2 - \tfrac{4}{27}q^3)}\},$$

i.e. here a^3, b^3 are each of them a 2-valued function, but as the only effect of altering the sign of the quadric radical is to interchange a^3, b^3, they may be regarded as each of them 1-valued; a and b are each of them 3-valued (for observe that here only a^3b^3, not ab, is given); and $ab(a + b)$ thus is in appearance a 9-valued function; but it can easily be shown that it is (as it ought to be) only 3-valued.

In the case of a numerical cubic, even when the coefficients are real, substituting their values in the expression

$$x = \sqrt[3]{[\tfrac{1}{2}\{r + \sqrt{(r^2 - \tfrac{4}{27}q^3)}\}]} + \tfrac{1}{3}q \div \sqrt[3]{[\tfrac{1}{2}\{r + \sqrt{(r^2 - \tfrac{4}{27}q^3)}\}]},$$

this may depend on an expression of the form $\sqrt[3]{(\gamma + \delta i)}$ where γ and δ are real numbers (it will do so if $r^2 - \tfrac{4}{27}q^3$ is a negative number), and then we *cannot* by the extraction of any root or roots of real positive numbers reduce $\sqrt[3]{(\gamma + \delta i)}$ to the form $c + di$, c and d real numbers; hence here the algebraical solution does not give the numerical solution, and we have here the so-called “irreducible case” of a cubic equation. By what precedes there is nothing in this that might not have been expected; the algebraical solution makes the solution depend on the extraction of the cube root of a number, and there was no reason for expecting this to be a real number. It is well known that the case in question is that wherein the three roots of the numerical cubic equation are all real; if the roots are two imaginary, one real, then contrariwise the quantity under the cube root is real; and the algebraical solution gives the numerical one.

The irreducible case is solvable by a trigonometrical formula, but this is not a solution by radicals: it consists in effect in reducing the given numerical cubic (not to a cubic of the form $z^3 = a$, solvable by the extraction of a cube root, but) to a cubic of the form $4x^3 - 3x = a$, corresponding to the equation 4

$\cos^3\theta - 3\cos\theta = \cos 3\theta$ which serves to determine $\cos\theta$ when $\cos 3\theta$ is known. The theory is applicable to an algebraical cubic equation; say that such an equation, if it can be reduced to the form $4x^3 - 3x = a$, is solvable by "trisection"—then the general cubic equation is solvable by trisection.

18. A quartic equation is solvable by radicals, and it is to be remarked that the existence of such a solution depends on the existence of 3-valued functions such as ab + cd of the four roots (a, b, c, d): by what precedes ab + cd is the root of a cubic equation, which equation is solvable by radicals: hence ab + cd can be found by radicals; and since abcd is a given function, ab and cd can then be found by radicals. But by what precedes, if ab be known then any similar function, say a + b, is obtainable rationally; and then from the values of a + b and ab we may by radicals obtain the value of a or b, that is, an expression for the root of the given quartic equation: the expression ultimately obtained is 4-valued, corresponding to the different values of the several radicals which enter therein, and we have thus the expression by radicals of each of the four roots of the quartic equation. But when the quartic is numerical the same thing happens as in the cubic, and the algebraical solution does not in every case give the numerical one.

It will be understood from the foregoing explanation as to the quartic how in the next following case, that of the quintic, the question of the solvability by radicals depends on the existence or non-existence of k-valued functions of the five roots (a, b, c, d, e); the fundamental theorem is the one already stated, a rational function of five letters, if it has less than 5, cannot have more than 2 values, that is, there are no 3-valued or 4-valued functions of 5 letters: and by reasoning depending in part upon this theorem, N.H. Abel (1824) showed that a general quintic equation is not solvable by radicals; and *a fortiori* the general equation of any order higher than 5 is not solvable by radicals.

19. The general theory of the solvability of an equation by radicals depends fundamentally on A.T. Vandermonde's remark (1770) that, supposing an equation is solvable by radicals, and that we have therefore an algebraical expression of x in terms of the coefficients, then substituting for the coefficients their values in terms of the roots, the resulting expression must reduce itself to any one at pleasure of the roots a, b, c ...; thus in the case of the quadric equation, in the expression $x = \frac{1}{2}\{p + \sqrt{(p^2 - 4q)}\}$, substituting for p and q their values, and observing that $(a + b)^2 - 4ab = (a - b)^2$, this becomes $x = \frac{1}{2}\{a + b + \sqrt{(a - b)^2}\}$, the value being a or b according as the radical is taken to be $+(a - b)$ or $-(a - b)$.

So in the cubic equation $x^3 - px^2 + qx - r = 0$, if the roots are a, b, c, and if ω is used to denote an imaginary cube root of unity, $\omega^2 + \omega + 1 = 0$, then writing for shortness $p = a + b + c$, $L = a + \omega b + \omega^2 c$, $M = a + \omega^2 b + \omega c$, it is at once seen that LM, $L^3 + M^3$, and therefore also $(L^3 - M^3)^2$ are 718 symmetrical functions of the roots, and consequently rational functions of the coefficients; hence

$$\tfrac{1}{2}\{L^3 + M^3 + \sqrt{(L^3 - M^3)^2}\}$$

is a rational function of the coefficients, which when these are replaced by their values as functions of the roots becomes, according to the sign given to the quadric radical, $= L^3$ or M^3; taking it $= L^3$, the cube root of the expression has the three values L, ωL, $\omega^2 L$; and LM divided by the same cube root has therefore the values M, $\omega^2 M$, ωM; whence finally the expression

$$\tfrac{1}{3}\left[p + \sqrt[3]{\{\tfrac{1}{2}(L^3 + M^3 + \sqrt{(L^3 - M^3)^2})\}} + LM \div \sqrt[3]{\{\tfrac{1}{2}L^3 + M^3 + \sqrt{(L^3 - M^3)^2})\}}\right]$$

has the three values

$$\tfrac{1}{3}(p + L + M),\ \tfrac{1}{3}(p + \omega L + \omega^2 M),\ \tfrac{1}{3}(p + \omega^2 L + \omega M);$$

that is, these are $= a, b, c$ respectively. If the value M^3 had been taken instead of L^3, then the expression would have had the same three values a, b, c. Comparing the solution given for the cubic $x^3 + qx - r = 0$, it will readily be seen that the two solutions are identical, and that the function $r^2 - \frac{4}{27}q^3$ under the radical sign must (by aid of the relation $p = 0$ which subsists in this case) reduce itself to $(L^3 - M^3)^2$; it is only by each radical being equal to a rational function of the roots that the final expression *can* become equal to the roots a, b, c respectively.

20. The formulae for the cubic were obtained by J.L. Lagrange (1770-1771) from a different point of view. Upon examining and comparing the principal known methods for the solution of algebraical equations, he found that they all ultimately depended upon finding a "resolvent" equation of which the root is $a + \omega b + \omega^2 c + \omega^3 d + \ldots$, ω being an imaginary root of unity, of the same order as the equation; *e.g.* for the cubic the root is $a + \omega b + \omega^2 c$, ω an imaginary cube root of unity. Evidently the method gives for L^3 a quadric equation, which is the "resolvent" equation in this particular case.

For a quartic the formulae present themselves in a somewhat different form, by reason that 4 is not a prime number. Attempting to apply it to a quintic, we seek for the equation of which the root is $(a + \omega b + \omega^2 c + \omega^3 d + \omega^4 e)$, ω an imaginary fifth root of unity, or rather the fifth power thereof $(a + \omega b + \omega^2 c + \omega^3 d + \omega^4 e)^5$; this is a 24-valued function, but if we consider the four values corresponding to the roots of unity $\omega, \omega^2, \omega^3, \omega^4$, viz. the values

$$(a + \omega\, b + \omega^2 c + \omega^3 d + \omega^4 e)^5,$$
$$(a + \omega^2 b + \omega^4 c + \omega\, d + \omega^3 e)^5,$$
$$(a + \omega^3 b + \omega\, c + \omega^4 d + \omega^2 e)^5,$$
$$(a + \omega^4 b + \omega^3 c + \omega^2 d + \omega\, e)^5,$$

any symmetrical function of these, for instance their sum, is a 6-valued function of the roots, and may

therefore be determined by means of a sextic equation, the coefficients whereof are rational functions of the coefficients of the original quintic equation; the conclusion being that the solution of an equation of the fifth order is made to depend upon that of an equation of the sixth order. This is, of course, useless for the solution of the quintic equation, which, as already mentioned, does not admit of solution by radicals; but the equation of the sixth order, Lagrange's resolvent sextic, is very important, and is intimately connected with all the later investigations in the theory.

21. It is to be remarked, in regard to the question of solvability by radicals, that not only the coefficients are taken to be arbitrary, but it is assumed that they are represented each by a single letter, or say rather that they are not so expressed in terms of other arbitrary quantities as to make a solution possible. If the coefficients are not all arbitrary, for instance, if some of them are zero, a sextic equation might be of the form $x^6 + bx^4 + cx^2 + d = 0$, and so be solvable as a cubic; or if the coefficients of the sextic are given functions of the six arbitrary quantities a, b, c, d, e, f, such that the sextic is really of the form $(x^2 + ax + b)(x^4 + cx^3 + dx^2 + ex + f) = 0$, then it breaks up into the equations $x^2 + ax + b = 0$, $x^4 + cx^3 + dx^2 + ex + f = 0$, and is consequently solvable by radicals; so also if the form is $(x - a)(x - b)(x - c)(x - d)(x - e)(x - f) = 0$, then the equation is solvable by radicals,—in this extreme case rationally. Such cases of solvability are self-evident; but they are enough to show that the general theorem of the non-solvability by radicals of an equation of the fifth or any higher order does not in any wise exclude for such orders the existence of particular equations solvable by radicals, and there are, in fact, extensive classes of equations which are thus solvable; the binomial equations $x^n - 1 = 0$ present an instance.

22. It has already been shown how the several roots of the equation $x^n - 1 = 0$ can be expressed in the form $\cos 2s\pi/n + i \sin 2s\pi/n$, but the question is now that of the algebraical solution (or solution by radicals) of this equation. There is always a root = 1; if ω be any other root, then obviously $\omega, \omega^2, \ldots \omega^{n-1}$ are all of them roots; $x^n - 1$ contains the factor $x - 1$, and it thus appears that $\omega, \omega^2, \ldots \omega^{n-1}$ are the n-1 roots of the equation

$$x^{n-1} + x^{n-2} + \ldots x + 1 = 0;$$

we have, of course, $\omega^{n-1} + \omega^{n-2} + \ldots + \omega + 1 = 0$.

It is proper to distinguish the cases n prime and n composite; and in the latter case there is a distinction according as the prime factors of n are simple or multiple. By way of illustration, suppose successively n = 15 and n = 9; in the former case, if α be an imaginary root of $x^3 - 1 = 0$ (or root of $x^2 + x + 1 = 0$), and β an imaginary root of $x^5 - 1 = 0$ (or root of $x^4 + x^3 + x^2 + x + 1 = 0$), then ω may be taken = $\alpha\beta$; the successive powers thereof, $\alpha\beta, \alpha^2\beta^2, \beta^3, \alpha\beta^4, \alpha^2, \beta, \alpha\beta^2, \alpha^2\beta^3, \beta^4, \alpha, \alpha^2\beta, \beta^2, \alpha\beta^3, \alpha^2\beta^4$, are the roots of $x^{14} + x^{13} + \ldots + x + 1 = 0$; the solution thus depends on the solution of the equations $x^3 - 1 = 0$ and $x^5 - 1 = 0$. In the latter case, if α be an imaginary root of $x^3 - 1 = 0$ (or root of $x^2 + x + 1 = 0$), then the equation $x^9 - 1 = 0$ gives $x^3 = 1, \alpha$, or α^2; $x^3 = 1$ gives $x = 1, \alpha$, or α^2; and the solution thus depends on the solution of the equations $x^3 - 1 = 0$, $x^3 - \alpha = 0$, $x^3 - \alpha^2 = 0$. The first equation has the roots $1, \alpha, \alpha^2$; if β be a root of either of the others, say if $\beta^3 = \alpha$, then assuming $\omega = \beta$, the successive powers are $\beta, \beta^2, \alpha, \alpha\beta, \alpha\beta^2, \alpha^2, \alpha^2\beta, \alpha^2\beta^2$, which are the roots of the equation $x^8 + x^7 + \ldots + x + 1 = 0$.

It thus appears that the only case which need be considered is that of n a prime number, and writing (as is more usual) r in place of ω, we have $r, r^2, r^3, \ldots r^{n-1}$ as the $(n - 1)$ roots of the reduced equation

$$x^{n-1} + x^{n-2} + \ldots + x + 1 = 0;$$

then not only $r^n - 1 = 0$, but also $r^{n-1} + r^{n-2} + \ldots + r + 1 = 0$.

23. The process of solution due to Karl Friedrich Gauss (1801) depends essentially on the arrangement of the roots in a certain order, viz. not as above, with the indices of r in arithmetical progression, but with their indices in geometrical progression; the prime number n has a certain number of prime roots g, which are such that g^{n-1} is the lowest power of g, which is $\equiv 1$ to the modulus n; or, what is the same thing, that the series of powers $1, g, g^2, \ldots g^{n-2}$, each divided by n, leave (in a different order) the remainders $1, 2, 3, \ldots n - 1$; hence giving to r in succession the indices $1, g, g^2, \ldots g^{n-2}$, we have, in a different order, the whole series of roots $r, r^2, r^3, \ldots r^{n-1}$.

In the most simple case, n = 5, the equation to be solved is $x^4 + x^3 + x^2 + x + 1 = 0$; here 2 is a prime root of 5, and the order of the roots is r, r^2, r^4, r^3. The Gaussian process consists in forming an equation for determining the periods P_1, P_2, $= r + r^4$ and $r^2 + r^3$ respectively;—these being such that the symmetrical functions $P_1 + P_2$, P_1P_2 are rationally determinable: in fact $P_1 + P_2 = -1$, $P_1P_2 = (r + r^4)(r^2 + r^3)$, $= r^3 + r^4 + r^6 + r^7$, $= r^3 + r^4 + r + r^2$, $= -1$. P_1, P_2 are thus the roots of $u^2 + u - 1 = 0$; and taking them to be known, they are themselves broken up into subperiods, in the present case single terms, r and r^4 for P_1, r^2 and r^3 for P_2; the symmetrical functions of these are then rationally determined in terms of P_1 and P_2; thus $r + r^4 = P_1$, $r \cdot r^4 = 1$, or r, r^4 are the roots of $u^2 - P_1u + 1 = 0$. The mode of division is more clearly seen for a larger value of n; thus, for n = 7 a prime root is = 3, and the arrangement of the roots is $r, r^3, r^2, r^6, r^4, r^5$. We may form either 3 periods each of 2 terms, $P_1, P_2, P_3 = r + r^6, r^3 + r^4, r^2 + r^5$ respectively; or else 2 periods each of 3 terms, $P_1, P_2 = r + r^2 + r^4$, $r^3 + r^6 + r^5$ respectively; in each ease the symmetrical functions of the periods are rationally determinable: thus in the case of the two periods $P_1 + P_2 = -1$, $P_1P_2 = 3 + r + r^2 + r^3 + r^4 + r^5 + r^6$, $= 2$; and the periods being known the symmetrical functions of the several terms of each period are rationally determined in terms of the periods, thus $r + r^2 + r^4 = P_1$, $r \cdot r^2 + r \cdot r^4 + r^2 \cdot r^4 = P_2$, $r \cdot r^2 \cdot r^4 = 1$.

The theory was further developed by Lagrange (1808), who, applying his general process to the equation in question, $x^{n-1} + x^{n-2} + \ldots + x + 1 = 0$ (the roots a, b, c... being the several powers of r, the indices in geometrical progression as above), showed that the function $(a + \omega b + \omega^2 c + \ldots)^{n-1}$ was in this case a given function of ω with integer coefficients.

Reverting to the before-mentioned particular equation $x^4 + x^3 + x^2 + x + 1 = 0$, it is very interesting to compare the process of solution with that for the solution of the general quartic the roots whereof are a, b, c, d.

Take ω, a root of the equation $\omega^4 - 1 = 0$ (whence ω is = 1, −1, i, or −i, at pleasure), and consider the expression

$$(a + \omega b + \omega^2 c + \omega^3 d)^4,$$

the developed value of this is

$$\begin{array}{ll} = & a^4 + b^4 + c^4 + d^4 + 6\,(a^2c^2 + b^2d^2) + 12\,(a^2bd + b^2ca + c^2db + d^2ac) \\ +\omega & \{4\,(a^3b + b^3c + c^3 + d^3a) + 12\,(a^2cd + b^2da + c^2ab + d^2bc)\,\} \\ +\omega^2 & \{6\,(a^2b^2 + b^2c^2 + c^2d^2 + d^2a^2) + 4\,(a^3c + b^3d + c^3a + d^3b) + 24abcd\} \\ +\omega^3 & \{4\,(a^3d + b^3a + c^3b + d^3c) + 12\,(a^2bc + b^2cd + c^2da + d^2ab)\,\} \end{array}$$

that is, this is a 6-valued function of a, b, c, d, the root of a sextic (which is, in fact, solvable by radicals; but this is not here material). 719

If, however, a, b, c, d denote the roots r, r^2, r^4, r^3 of the special equation, then the expression becomes

$$\begin{array}{lll} r^4 & + r^3 + r + r^2 + 6\,(1 + 1) & + 12\,(r^2 + r^4 + r^3 + r) \\ & + \omega\,\{4\,(1 + 1 + 1 + 1) & + 12\,(r^4 + r^3 + r + r^2)\,\} \\ & + \omega^2\{6\,(r + r^2 + r^4 + r^3) & + 4\,(r^2 + r^4 + r^3 + r)\,\} \\ & + \omega^3\{4\,(r + r^2 + r^4 + r^3) & + 12\,(r^3 + r + r^2 + r^4)\,\} \end{array}$$

viz. this is

$$= -1 + 4\omega + 14\omega^2 - 16\omega^3,$$

a completely determined value. That is, we have

$$(r + \omega r^2 + \omega^2 r^4 + \omega^3 r^3) = -1 + 4\omega + 14\omega^2 - 16\omega^3,$$

which result contains the solution of the equation. If ω = 1, we have $(r + r^2 + r^4 + r^3)^4 = 1$, which is right; if ω = −1, then $(r + r^4 - r^2 - r^3)^4 = 25$; if ω = i, then we have $\{r - r^4 + i(r^2 - r^3)\,\}^4 = -15 + 20i$; and if ω = −i, then $\{r - r^4 - i\,(r^2 - r^3)\,\}^4 = -15 - 20i$; the solution may be completed without difficulty.

The result is perfectly general, thus:—n being a prime number, r a root of the equation $x^{n-1} + x^{n-2} + \ldots + x + 1 = 0$, ω a root of $\omega^{n-1} - 1 = 0$, and g a prime root of $g^{n-1} \equiv 1 \pmod{n}$, then

$$(r + \omega r^{g} + \ldots + \omega^{n-2} r^{g^{n-2}})^{n-1}$$

is a given function $M_0 + M_1\omega \ldots + M_{n-2}\omega^{n-2}$ with integer coefficients, and by the extraction of (n − 1)th roots of this and similar expressions we ultimately obtain r in terms of ω, which is taken to be known; the equation $x^n - 1 = 0$, n a prime number, is thus solvable by radicals. In particular, if n − 1 be a power of 2, the solution (by either process) requires the extraction of square roots only; and it was thus that Gauss discovered that it was possible to construct geometrically the regular polygons of 17 sides and 257 sides respectively. Some interesting developments in regard to the theory were obtained by C.G.J. Jacobi (1837); see the memoir "Ueber die Kreistheilung, u.s.w.," *Crelle*, t. xxx. (1846).

The equation $x^{n-1} + \ldots + x + 1 = 0$ has been considered for its own sake, but it also serves as a specimen of a class of equations solvable by radicals, considered by N.H. Abel (1828), and since called Abelian equations, viz. for the Abelian equation of the order n, if x be any root, the roots are x, θx, $\theta^2 x$, ... $\theta^{n-1}x$ (θx being a rational function of x, and $\theta^n x = x$); the theory is, in fact, very analogous to that of the above particular case.

A more general theorem obtained by Abel is as follows:—If the roots of an equation of any order are connected together in such wise that *all* the roots can be expressed rationally in terms of any one of them, say x; if, moreover, θx, $\theta_1 x$ being any two of the roots, we have $\theta\theta_1 x = \theta_1\theta x$, the equation will be solvable algebraically. It is proper to refer also to Abel's definition of an *irreducible* equation:—an equation φx = 0, the coefficients of which are rational functions of a certain number of known quantities a, b, c ..., is called irreducible when it is impossible to express its roots by an equation of an inferior degree, the coefficients of which are also rational functions of a, b, c ... (or, what is the same thing, when φx does not break up into factors which are rational functions of a, b, c ...). Abel applied his theory to the equations which present themselves in the division of the elliptic functions, but not to the modular equations.

24. But the theory of the algebraical solution of equations in its most complete form was

established by Evariste Galois (born October 1811, killed in a duel May 1832; see his collected works, *Liouville*, t. xl., 1846). The definition of an irreducible equation resembles Abel's,—an equation is reducible when it admits of a rational divisor, irreducible in the contrary case; only the word *rational* is used in this extended sense that, in connexion with the coefficients of the given equation, or with the irrational quantities (if any) whereof these are composed, he considers any number of other irrational quantities called "adjoint radicals," and he terms rational any rational function of the coefficients (or the irrationals whereof they are composed) and of these adjoint radicals; the epithet irreducible is thus taken either absolutely or in a relative sense, according to the system of adjoint radicals which are taken into account. For instance, the equation $x^4 + x^3 + x^2 + x + 1 = 0$; the left hand side has here no rational divisor, and the equation is irreducible; but this function is $= (x^2 + \frac{1}{2} x + 1)^2 - \frac{5}{4} x^2$, and it has thus the irrational divisors $x^2 + \frac{1}{2}(1 + \sqrt{5})x + 1$, $x^2 + \frac{1}{2}(1 - \sqrt{5})x + 1$; and these, if we *adjoin* the radical $\sqrt{5}$, are rational, and the equation is no longer irreducible. In the case of a given equation, assumed to be irreducible, the problem to solve the equation is, in fact, that of finding radicals by the adjunction of which the equation becomes reducible; for instance, the general quadric equation $x^2 + px + q = 0$ is irreducible, but it becomes reducible, breaking up into rational linear factors, when we adjoin the radical $\sqrt{(\frac{1}{4} p^2 - q)}$.

The fundamental theorem is the Proposition I. of the "Mémoire sur les conditions de résolubilité des équations par radicaux"; viz. given an equation of which a, b, c ... are the m roots, there is always a group of permutations of the letters a, b, c ... possessed of the following properties:—

1. Every function of the roots invariable by the substitutions of the group is rationally known.

2. Reciprocally every rationally determinable function of the roots is invariable by the substitutions of the group.

Here by an invariable function is meant not only a function of which the form is invariable by the substitutions of the group, but further, one of which the value is invariable by these substitutions: for instance, if the equation be $\varphi(x) = 0$, then $\varphi(x)$ is a function of the roots invariable by any substitution whatever. And in saying that a function is rationally known, it is meant that its value is expressible rationally in terms of the coefficients and of the adjoint quantities.

For instance in the case of a general equation, the group is simply the system of the 1.2.3 ... n permutations of all the roots, since, in this case, the only rationally determinable functions are the symmetric functions of the roots.

In the case of the equation $x^{n-1} \ldots + x + 1 = 0$, n a prime number, a, b, c ... k = r, r^g, r^{g^2} ... $r^{g^{n-2}}$, where g is a prime root of n, then the group is the cyclical group abc ... k, bc ... ka, ... kab ... j, that is, in this particular case the number of the permutations of the group is equal to the order of the equation.

This notion of the group of the original equation, or of the group of the equation as varied by the adjunction of a series of radicals, seems to be the fundamental one in Galois's theory. But the problem of solution by radicals, instead of being the sole object of the theory, appears as the first link of a long chain of questions relating to the transformation and classification of irrationals.

Returning to the question of solution by radicals, it will be readily understood that by the adjunction of a radical the group may be diminished; for instance, in the case of the general cubic, where the group is that of the six permutations, by the adjunction of the square root which enters into the solution, the group is reduced to abc, bca, cab; that is, it becomes possible to express rationally, in terms of the coefficients and of the adjoint square root, any function such as $a^2b + b^2c + c^2a$ which is not altered by the cyclical substitution a into b, b into c, c into a. And hence, to determine whether an equation of a given form is solvable by radicals, the course of investigation is to inquire whether, by the successive adjunction of radicals, it is possible to reduce the original group of the equation so as to make it ultimately consist of a single permutation.

The condition in order that an equation of a given prime order n may be solvable by radicals was in this way obtained—in the first instance in the form (scarcely intelligible without further explanation) that every function of the roots x_1, x_2 ... x_n, invariable by the substitutions $x_{ak + b}$ for x_k, must be rationally known; and then in the equivalent form that the resolvent equation of the order 1.2 ... (n − 2) must have a rational root. In particular, the condition in order that a quintic equation may be solvable is that Lagrange's resolvent of the order 6 may have a rational factor, a result obtained from a direct investigation in a valuable memoir by E. Luther, *Crelle*, t. xxxiv. (1847).

Among other results demonstrated or announced by Galois may be mentioned those relating to the modular equations in the theory of elliptic functions; for the transformations of the orders 5, 7, 11, the modular equations of the orders 6, 8, 12 are depressible to the orders 5, 7, 11 respectively; but for the transformation, n a prime number greater than 11, the depression is impossible.

The general theory of Galois in regard to the solution of equations was completed, and some of the demonstrations supplied by E. Betti (1852). See also J.A. Serret's *Cours d'algèbre supérieure*, 2nd ed. (1854); 4th ed. (1877-1878).

25. Returning to quintic equations, George Birch Jerrard (1835) established the theorem that the general quintic equation is by the extraction of only square and cubic roots reducible to the form $x^5 + ax + b = 0$, or what is the same thing, to $x^5 + x + b = 0$. The actual reduction by means of Tschirnhausen's theorem was effected by Charles Hermite in connexion with his elliptic-function solution of the quintic equation (1858) in a very elegant manner. It was shown by Sir James Cockle

and Robert Harley (1858-1859) in connexion with the Jerrardian form, and by Arthur Cayley (1861), that Lagrange's resolvent equation of the sixth order can be replaced by a more simple sextic equation occupying a like place in the theory.

The theory of the modular equations, more particularly for the case n = 5, has been studied by C. Hermite, L. Kronecker and F. Brioschi. In the case n = 5, the modular equation of the order 6 depends, as already mentioned, on an equation of the order 5; and conversely the general quintic equation may be made to depend upon this modular equation of the order 6; that is, assuming the solution of this modular equation, we can solve (not by radicals) the general quintic equation; this is Hermite's solution of the general quintic equation by elliptic functions (1858); it is analogous to the before-mentioned trigonometrical solution of the cubic equation. The theory is reproduced and developed in Brioschi's memoir, "Über die Auflösung der Gleichungen vom fünften Grade," *Math. Annalen*, t. xiii. (1877-1878).

26. The modern work, reproducing the theories of Galois, and exhibiting the theory of algebraic equations as a whole, is C. Jordan's *Traité des substitutions et des équations algébriques* (Paris, 1870). The work is divided into four books—book i., preliminary, relating to the theory of congruences; book ii. is in two chapters, the first relating to substitutions in general, the second to substitutions defined analytically, and chiefly to linear substitutions; book iii. has four chapters, the first discussing the principles of the general theory, the other three containing applications to algebra, geometry, and the theory of transcendents; lastly, book iv., divided into seven chapters, contains a determination of the general types of equations solvable by radicals, and a complete system of classification of these types. A glance through the index will show the vast extent which the theory has assumed, and the form of general conclusions arrived at; thus, in book iii., the algebraical applications comprise Abelian equations, equations of Galois; the geometrical ones comprise Q. Hesse's equation, R.F.A. Clebsch's equations, lines on a quartic surface having a nodal line, singular points of E.E. Kummer's surface, lines on a cubic surface, problems of contact; the applications to the theory of transcendents comprise circular functions, elliptic functions (including division and the modular equation), hyperelliptic functions, solution of equations by transcendents. And on this last subject, solution of equations by transcendents, we may quote the result—"the solution of the general equation of an order superior to five cannot be made to depend upon that of the equations for the division of the circular or elliptic functions"; and again (but with a reference to a possible case of exception), "the general equation cannot be solved by aid of the equations which give the division of the hyperelliptic functions into an odd number of parts." (See also GROUPS, THEORY OF.)

(A. CA.)

BIBLIOGRAPHY.—For the general theory see W.S. Burnside and A.W. Panton, *The Theory of Equations* (4th ed., 1899-1901); the Galoisian theory is treated in G.B. Matthews, *Algebraic Equations* (1907). See also the *Ency. d. math. Wiss.* vol. ii.

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1 The coefficients were selected so that the roots might be nearly 1, 2, 3.

2 The third edition (1826) is a reproduction of that of 1808; the first edition has the date 1798, but a large part of the contents is taken from memoirs of 1767-1768 and 1770-1771.

3 The earlier demonstrations by Euler, Lagrange, &c, relate to the case of a numerical equation with real coefficients; and they consist in showing that such equation has always a real quadratic divisor, furnishing two roots, which are either real or else conjugate imaginaries $\alpha + \beta i$ (see Lagrange's *Équations numériques*).

4 The square root of $\alpha + \beta i$ can be determined by the extraction of square roots of positive real numbers, without the trigonometrical tables.

EQUATION OF THE CENTRE, in astronomy, the angular distance, measured around the centre of motion, by which a planet moving in an ellipse deviates from the mean position which it would occupy if it moved uniformly. Its amount is the correction which must be applied positively or negatively to the mean anomaly in order to obtain the true anomaly. It arises from the ellipticity of the orbit, is zero at pericentre and apocentre, and reaches its greatest amount nearly midway between these points. (See ANOMALY and ORBIT.)

EQUATION OF TIME, the difference between apparent time, determined by the meridian passage of the real sun, and mean time, determined by the passage of the mean sun. It goes through a double period in the course of a year. Its amount varies a fraction of a minute for the same date, from year to year and from one longitude to another, on the same day. The following table shows an average value for any date and for the Greenwich meridian for a number of years, from which the actual value will

seldom deviate more than 20 seconds until after 1950. The + sign indicates that the real sun reaches the meridian *after* mean noon; the − sign *before* mean noon.

Table of the Equation of Time.

		m.	s.			m.	s.			m.	s.
Jan.	1	+3	26	Mar.	1	+12	39	May	1	−2	55
	6	5	45		6	11	35		6	−3	27
	11	7	51		11	10	20		11	−3	46
	16	9	43		16	8	58		16	−3	51
	21	11	19		21	7	30		21	−3	40
	26	12	36		26	5	59		26	−3	16
Feb.	1	+13	42	Apr.	1	+4	9	June	1	−2	32
	6	14	14		6	2	40		6	−1	44
	11	14	25		11	+1	15		11	−0	48
	16	14	17		16	−0	3		16	+0	14
	21	13	52		21	−1	12		21	1	19
	26	13	11		26	−2	10		26	2	24
July	1	+3	26	Sept.	1	+0	9	Nov.	1	−16	18
	6	4	21		6	−1	28		6	−16	19
	11	5	8		11	−3	10		11	−15	58
	16	5	44		16	−4	55		16	−15	15
	21	6	8		21	−6	41		21	−14	12
	26	6	18		26	−8	25		26	−12	49
Aug.	1	+6	10	Oct.	1	−10	5	Dec.	1	−11	7
	6	5	47		6	−11	38		6	−9	9
	11	5	9		11	−13	2		11	−6	57
	16	4	17		16	−14	14		16	−4	35
	21	3	12		21	−15	11		21	−2	7
	26	1	55		26	−15	52		26	+0	23

EQUATOR (Late Lat. *aequator*, from *aequare*, to make equal), in geography, that great circle of the earth, equidistant from the two poles, which divides the northern from the southern hemisphere and lies in a plane perpendicular to the axis of the earth; this is termed the “geographical” or “terrestrial equator.” In astronomy, the “celestial equator” is the name given to the great circle in which the plane of the terrestrial equator intersects the celestial sphere; it is consequently equidistant from the celestial poles. The “magnetic equator” is an imaginary line encircling the earth, along which the vertical component of the earth’s magnetic force is zero; it nearly coincides with the terrestrial equator.

EQUERRY (from the Fr. *écurie*, a stable, through its older form *escurie*, from the Med. Lat. *scuria*, a word of Teutonic origin for a stable or shed, cf. Ger. *Scheuer*; the modern spelling has confused the word with the Lat. *equus*, a horse), a contracted form of “gentleman of the equerry,” an officer in charge of the stables of a royal household. At the British court, equerries are officers attached to the department of the master of the horse, the first of whom is called chief equerry (see Household, Royal).

EQUIDAE, the family of perissodactyle ungulate mammals typified by the horse (*Equus caballus*); see Horse. According to the older classification this family was taken to include only the forms with tall-crowned teeth, more or less closely allied to the typical genus *Equus*. There is, however, such an almost complete graduation from the former to earlier and more primitive mammals with short-crowned cheek-teeth, at one time included in the family *Lophiodontidae* (see Perissodactyla), that it has now become a very general practice to include the whole “phylum” in the family *Equidae*. The

Equidae, in this extended sense, together with the extinct *Palaeotheriidae*, are indeed now regarded as forming one of four main groups into which the Perissodactyla are divided, the other groups being the Tapiroidea, Rhinocerotoidea and Titanotheriide. For the horse-group the name Hippoidea is employed. All four groups were closely connected in the Lower Eocene, so that exact definition is almost impossible.

In the Hippoidea there is generally the full series of 44 teeth, but the first premolar is often deciduous or wanting in the lower or in both jaws. The incisors are chisel-shaped, and the canines tend to become isolated so as in the now specialized forms to occupy nearly the middle of a longer or shorter gap between the incisors and premolars. In the upper molars the two outer columns of the primitive tubercular molar coalesce to form an outer wall, from which proceed two crescentic transverse crests; the connexion between the crests and the wall being imperfect or slight, and the crests themselves sometimes tubercular. Each of the lower molars carries two crescentic ridges. The number of toes ranges from four to one in the fore-foot, and from three to one in the hind-foot. The paroccipital, postglenoid and post-tympanic processes of the skull are large, and the latter always distinct. Normally there are no traces of horn-cores. The calcaneum lacks the facet for the fibula found in the Titanotheroidea.

In the earlier *Equidae* the teeth were short-crowned, with the premolars simpler than the molars; but there is a gradual tendency to an increase in the height of the crowns of the teeth, accompanied by increasing complexity of structure and the filling up of the hollows with cement. Similarly the gap on each side of the canine tooth in each jaw continues to increase in length; while in all the later forms the orbit is surrounded by a ring of bone. A third modification is the increasing length of limb (as well as in general bodily size), accompanied by a gradual reduction in the number of toes from three or four to one.

All the existing members of the family, such as the domesticated horse (*Equus caballus*) and its wild or half-wild relatives, the asses and the zebras, are included in the typical genus. In all these the crowns of the cheek-teeth are very tall (fig. 1, *b*) and only develop roots late in life; while their grinding-surfaces (fig. 2, *b* and *c*) are very complicated and have all the hollows filled with cement. The summits of the incisors are infolded, producing, when partially worn, the "mark." In the skull the orbit is surrounded by bone, and there is no distinct depression in front of the same. Each limb terminates in one large toe; the lateral digits being represented by the splint-bones, corresponding to the lateral metacarpals and metatarsals of *Hipparion*. Not unfrequently, however, the lower ends of the splint-bones carry a small expansion, representing the phalanges.

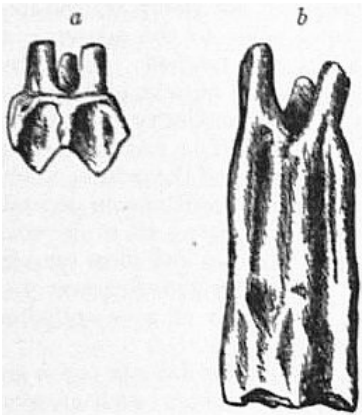


FIG. 1.—*a*, Side view of second upper molar tooth of *Anchitherium* (brachyodont form); *b*, corresponding tooth of horse (hypsidont form).

Remains of horses indistinguishable from *E. caballus* occur in the Pleistocene deposits of Europe and Asia; and it is from them that the dun-coloured small horses of northern Europe and Asia are probably derived. The ancestor of these Pleistocene horses is probably *E. stenonis*, of the Upper Pliocene of Europe, which has a small depression in front of the orbit, while the skull is relatively larger, the feet are rather shorter, and the splint-bones somewhat more developed. In India a nearly allied species (*E. sivalensis*), occurs in the Lower Pliocene, and may have been the ancestor of the Arab stock, which shows traces of the depression in front of the orbit characteristic of the earlier forms. In North America species of *Equus* occur in the Pleistocene and from that continent others reached South America during the same epoch. In the latter country occurs *Hippidium*, in which the cheek-teeth are shorter and simpler, and the nasal bones very long and slender, with elongated slits at the side. The limbs, especially the cannon-bones, are relatively short, and the splint-bones large. The allied Argentine *Onohippidium*, which is also Pleistocene, has still longer nasal bones and slits, and a deep double cavity in front of the orbit, part of which probably contained a gland. *Onohippidium* is certainly off the direct line of descent of the modern horses, and, on account of the length of the nasals and their slits, the same probably holds good for *Hippidium*.

FIG. 2.—*a*, Grinding surface of unworn right upper molar tooth of *Anchitherium*; *b*, corresponding surface of unworn molar of young horse; *c*, the same tooth after it has been some time in use. The uncoloured portions are the dentine or ivory, the shaded parts the cement filling the cavities and surrounding the exterior. The black line separating these two structures is the enamel or hardest constituent of the tooth.

Species from the Pliocene of Texas and the Upper Miocene (Loup Fork) of Oregon were at one time assigned to *Hippidium*, but this is incorrect, that genus being exclusively South American. The name *Pliohippus* has been applied to species from the same two formations on the supposition that the foot-structure was similar to that of *Hippidium*, but Mr J.W. Gidley is of opinion that the lateral digits may have been fully developed.

Apparently there is here some gap in the line of descent of the horse, and it may be suggested that the evolution took place, not as commonly supposed, in North America, but in eastern central Asia, of which the palaeontology is practically unknown; some support is given to this theory by the fact that the earliest species with which we are acquainted occur in northern India.

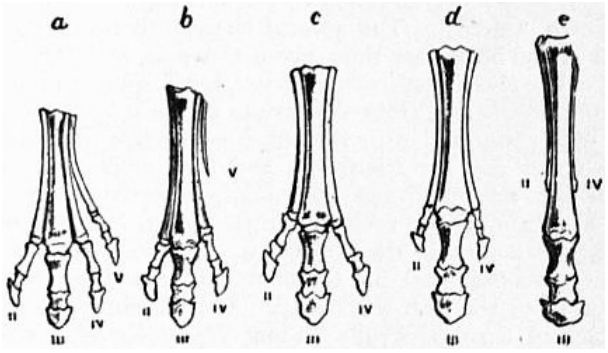


FIG. 3.—Successive stages of modification of the left fore-feet of extinct forms of horse-like animals, showing gradual reduction of the outer and enlargement of the middle toe (III).

a, *Hyracotherium* (Eocene).
b, *Mesohippus* (Oligocene).
c, *Anchitherium* (Miocene).
d, *Hipparion* (Pliocene).
e, *Equus* (Pleistocene).

Be this as it may, the next North American representatives of the family constitute the genera *Protohippus* and *Merychippus* of the Miocene, in both of which the lateral digits are fully developed and terminate in small though perfect hoofs. In both the cheek-teeth have moderately tall crowns, and in the first named of the two those of the milk-series are nearly similar to their permanent successors. In *Merychippus*, on the other hand, the milk-molars have short crowns, without any cement in the hollows, thus resembling the permanent molars of the under-mentioned genus *Anchitherium*. From the well-known *Hipparion*, or *Hippotherium*, typically from the Lower Pliocene of Europe, but also occurring in the corresponding formation in North Africa, Persia, India and China, and represented in the Upper Miocene Loup Fork beds of the United States by species which it has been proposed to separate generically as *Neohipparion*, we reach small horses which are now generally regarded as a lateral offshoot from the *Merychippus* type. The cheek-teeth, which have crowns of moderate height, differ from those of all the foregoing in that the postero-internal pillar (the projection on the right-hand top corner of *c* in fig. 2) is isolated in place of being attached by a narrow neck to the adjacent crescent. The skull, which is relatively short, has a large depression in front of the orbit, commonly supposed to have contained a gland, but this may be doubtful. In the typical, and also in the North American forms these were complete, although small, lateral toes in both feet (fig. 3, *d*), but it is possible that in *H. antilopinum* of India the lateral toes had disappeared. If this be so, we have the development of a monodactyle foot in this genus independently of *Equus*.

The foregoing genera constitute the subfamily *Equinae*, or the *Equidae* as restricted by the older writers. In all the dentition is of the hypsodont type, with the hollows of the cheek-teeth filled by cement, the premolars molariform, and the first small and generally deciduous. The orbit is surrounded by a bony ring; the ulna and radius in the fore, and the tibia and fibula in the hind-limb are united, and the feet are of the types described above. Between this subfamily and the second subfamily, *Hyracotheriinae*, a partial connexion is formed by the North American Upper Miocene genera *Desmatippus* and *Anchippus* or *Parahippus*. The characteristics of the group will be gathered from the remarks on the leading genera; but it may be mentioned that the orbit is open behind, the cheek-teeth are short-crowned and without cement (fig. 1, *a*), the gap between the canine and the outermost incisor is short, the bones of the middle part of the leg are separate, and there are at least three toes to each foot.

The longest-known genus and the one containing the largest species is *Anchitherium*, typically from the Middle Miocene of Europe, but also represented by one species from the Upper Miocene of North America. The European *A. aurelianense* was of the size of an ordinary donkey. The cheek-teeth are of the type shown in *a* of figs. 1 and 2; the premolars, with the exception of the small first one, being molar-like; and the lateral toes (fig. 3, *c*) were to some extent functional. The summits of the incisors were infolded to a small extent. Nearly allied is the American *Mesohippus*, ranging from the Lower Miocene to the Lower Oligocene of the United States, of which the earliest species stood only about

18 in. at the shoulder. The incisors were scarcely, if at all, infolded, and there is a rudiment of the fifth metacarpal (fig. 3, *b*). By some writers all the species of *Mesohippus* are included in the genus *Miohippus*, but others consider that the two genera are distinct.

Mesohippus and *Miohippus* are connected with the earliest and most primitive mammal which it is possible to include in the family *Equidae* by means of *Epihippus* of the Uinta or Upper Eocene of North America, and *Pachynolophus*, or *Orohippus*, of the Middle and Lower Eocene of both halves of the northern hemisphere. The final stage, or rather the initial stage, in the series is presented by *Hyracotherium* (*Protorohippus*), a mammal no larger than a fox, common to the Lower Eocene of Europe and North America. The general characteristics of this progenitor of the horses are those given above as distinctive of the group. The cheek-teeth are, however, much simpler than those of *Anchitherium*; the transverse crests of the upper molars not being fully connected with the outer wall, while the premolars in the upper jaw are triangular, and thus unlike the molars. The incisors are small and the canines scarcely enlarged; the latter having a gap on each side in the lower, but only one on their hinder aspect in the upper jaw. The fore-feet have four complete toes (fig. 3, *a*), but there are only three hind-toes, with a rudiment of the fifth metatarsal. The vertebrae are simpler in structure than in *Equus*. From *Hyracotherium*, which is closely related to the Eocene representatives of the ancestral stocks of the other three branches of the Perissodactyla, the transition is easy to *Phenacodus*, the representative of the common ancestor of all the Ungulata.

See also H.F. Osborn, “New Oligocene Horses,” *Bull. Amer. Mus.* vol. xx. p. 167 (1904); J.W. Gidley, *Proper Generic Names of Miocene Horses*, p. 191; and the article PALAEONTOLOGY.

(R. L.*)

EQUILIBRIUM (from the Lat. *aequus*, equal, and *libra*, a balance), a condition of equal balance between opposite or counteracting forces. By the “sense of equilibrium” is meant the sense, or sensations, by which we have a feeling of security in standing, walking, and indeed in all the movements by which the body is carried through space. Such a feeling of security is necessary both for maintaining any posture, such as standing, or for performing any movement. If this feeling is absent or uncertain, or if there are contradictory sensations, then definite muscular movements are inefficiently or irregularly performed, and the body may stagger or fall. When we stand erect on a firm surface, like a floor, there is a feeling of resistance, due to nervous impulses reaching the brain from the soles of the feet and from the muscles of the limbs and trunk. In walking or running, these feelings of resistance seem to precede and guide the muscular movements necessary for the next step. If these are absent or perverted or deficient, as is the case in the disease known as locomotor ataxia, then, although there is no loss of the power of voluntary movement, the patient staggers in walking, especially if he is not allowed to look at his feet, or if he is blind-folded. He misses the guiding sensations that come from the limbs; and with a feeling that he is walking on a soft substance, offering little or no resistance, he staggers, and his muscular movements become irregular. Such a condition maybe artificially brought about by washing the soles of the feet with chloroform or ether. And it has been observed to exist partially after extensive destruction of the skin of the soles of the feet by burns or scalds. This shows that tactile impulses from the skin take a share in generating the guiding sensation. In the disease above mentioned, however, tactile impressions may be nearly normal, but the guiding sensation is weak and inefficient, owing to the absence of impulses from the muscles. The disease is known to depend on morbid changes in the posterior columns of the spinal cord, by which impulses are not freely transmitted upwards to the brain. These facts point to the existence of impulses coming from the muscles and tendons. It is now known that there exist peculiar spindles, in muscle, and rosettes or coils or loops of nerve fibres in close proximity to tendons. These are the end organs of the sense. The transmission of impulses gives rise to the *muscular sense*, and the guiding sensation which precedes co-ordinated muscular movements depends on these impulses. Thus from the limbs streams of nervous impulses pass to the sensorium from the skin and from muscles and tendons; these may or may not arouse consciousness, but they guide or evoke muscular movements of a co-ordinated character, more especially of the limbs.

In animals whose limbs are not adapted for delicate touch nor for the performance of complicated movements, such as some mammals and birds and fishes, the guiding sensations depend largely on the sense of vision. This sense in man, instead of assisting, sometimes disturbs the guiding sensation. It is true that in locomotor ataxia visual sensations may take the place of the tactile and muscular sensations that are inefficient, and the man can walk without staggering if he is allowed to look at the floor, and especially if he is guided by transverse straight lines. On the other hand, the acrobat on the wire-rope dare not trust his visual sensations in the maintenance of his equilibrium. He keeps his eyes fixed on one point instead of allowing them to wander to objects below him, and his muscular movements are regulated by the impulses that come from the skin and muscles of his limbs. The feeling of insecurity probably arises from a conception of height, and also from the knowledge that by no muscular movements can a man avoid a catastrophe if he should fall. A bird, on the other hand, depends largely on visual impressions, and it knows by experience that if launched into the air from a height it can fly. Here, probably, is an explanation of the large size of the eyes of birds. Cover the

head, as in hooding a falcon, and the bird seems to be deprived of the power of voluntary movement. Little effect will be produced if we attempt to restrain the movements of a cat by covering its eyes. A fish also is deprived of the power of motion if its eyes are covered. But both in the bird and in the fish tactile and muscular impressions, especially the latter, come into play in the mechanism of equilibrium. In flight the large-winged birds, especially in soaring, can feel the most delicate wind-pressures, both as regards direction and force, and they adapt the position of their body so as to catch the pressure at the most efficient angle. The same is true of the fish, especially of the flat-fishes. In mammals the sense of equilibrium depends, then, on streams of tactile, muscular and visual impressions pouring in on the sensorium, and calling forth appropriate muscular movements. It has also been suggested that impulses coming from the abdominal viscera may take part in the mechanism. The presence in the mesentery of felines (cats, &c.) of large numbers of Pacinian corpuscles, which are believed to be modified tactile bodies, favours this supposition. Such animals are remarkable for the delicacy of such muscular movements, as balancing and leaping.

There is another channel by which nervous impulses reach the sensorium and play their part in the sense of equilibrium, namely, from the semicircular canals, a portion of the internal ear. It is pointed out in the article Hearing that the appreciation of sound is in reality an appreciation of variations of pressure. The labyrinth consists of the vestibule, the cochlea and the semicircular canals. The cochlea receives the sound-waves (variations of pressure) that constitute musical tones. This it accomplishes by the structures in the ductus cochlearis. In the vestibule we find two sacs, the saccule next to and communicating with the ductus cochlearis, and the utricle communicating with the semicircular canals. The base of the stapes communicates pressures to the utricle. The membranous portion of the semicircular canals consists of a tube, dilated at one end into a swelling or pouch, termed the ampulla, and each end communicates freely with the utricle. On the posterior wall of both the saccule and of the utricle there is a ridge, termed in each case the macula acustica, bearing a highly specialized epithelium. A similar structure exists in each ampulla. This would suggest that all three structures have to do with hearing; but, on the other hand, there is experimental evidence that the utricle and the canals may transmit impressions that have to do with equilibrium. Pressure of the base of the stapes is exerted on the utricle. This will compress the fluid in that cavity, and tend to drive the fluid into the semicircular canals that communicate with that cavity by five openings. Each canal is surrounded by a thin layer of perilymph, so that it may yield a little to this pressure, and exert a pull or pressure on the nerve-endings in each ampulla. Thus impulses may be generated in the nerves of the ampullae.

The three semicircular canals lie in the three directions in space, and it has been suggested that they have to do with our appreciation of the direction of sound. But our appreciation of sound is very inaccurate: we look with the eyes for the source of a sound, and instinctively direct the ears or the head, or both, in the direction from which the sound appears to proceed. But the relationship of the canals on the two sides must have a physiological significance. Thus (1) the six canals are parallel, two and two; or (2) the two horizontal canals are in the same plane, while the superior canal on one side is nearly parallel with the posterior canal of the other. These facts point to the two sets of canals and ampullae acting as one organ, in a manner analogous to the action of two retinae for single vision.

We have next to consider how the canals may possibly act in connexion with the sense of equilibrium. In 1820 J. Purkinje studied the vertigo that follows rapid rotation of the body in the erect position on a vertical axis. On stopping the rotation there is a sense of rotation in the opposite direction, and this may occur even when the eyes are closed. Purkinje noticed that the position of the imaginary axis of rotation depends on the axis around which the head revolves. In 1828 M.J.P. Flourens discovered that injury to the canals causes disturbance to the equilibrium and loss of co-ordination, and that sections of the canals produce a rotatory movement of a kind corresponding to the canal that had been divided. Thus division of a membranous canal causes rotatory movements round an axis at right angles to the plane of the divided canal. The body of the animal always moves in the direction of the cut canal. Many other observers have corroborated these experiments. F. Goltz was the first who formulated the conditions necessary for equilibration. He put the matter thus:—(1) A central co-ordinating organ—in the brain; (2) centripetal fibres, with their peripheral terminations —in the ampullae; and (3) centrifugal fibres, with their terminal organs—in the muscular mechanisms. A lesion of any one of these portions of the mechanism causes loss or impairment of balancing. Cyon also investigated the subject, and concluded:—(1) To maintain equilibrium, we must have an accurate notion of the position of the head in space; (2) the function of the semicircular canals is to communicate impressions that give a representation of this position—each canal having a relation to one of the dimensions of space; (3) disturbance of equilibrium follows section; (4) involuntary movements following section are due to abnormal excitations; (5) abnormal movements occurring a few days after the operation are caused by irritation of the cerebellum.

On theoretical considerations of a physical character, E. Mach, Crum-Brown and Breuer have advanced theories based on the idea of the canals being organs for sensations of acceleration of movement, or for the sense of rotation. Mach first pointed out that Purkinje’s phenomena, already alluded to, were in all probability related to the semicircular canals. “He showed that when the body is moved in space, in a straight line, we are not conscious of the velocity of motion, but of variations in this velocity. Similarly, if a body is rotated round a vertical axis, we perceive only angular acceleration and not angular velocity. The sensations produced by angular acceleration last longer

than the acceleration itself, and the position of the head during the movements enables us to determine direction." Both Mach and Goltz state that varying pressures of the fluid in the canals produced by angular rotation produce sensations of movement (always in a direction opposite to the rotation of the body), and that these, in turn, cause the vertigo of Purkinje and the phenomena of Flourens. Mach, Crum-Brown and Breuer advance hydrodynamical theories in which they assume that the fluids move in the canals. Goltz, on the other hand, supports a hydrostatical theory in which he assumes that the phenomena can be accounted for by varying pressures. Crum-Brown differs from Mach and Breuer as follows:—(1) In attributing movement or variation of pressure not merely to the endolymph, but also to the walls of the membranous canals and to the surrounding perilymph; and (2) in regarding the two labyrinths as one organ, all the six canals being required to form a true conception of the rotating motion of the head. He sums up the matter thus: "We have two ways in which a relative motion can occur between the endolymph and the walls of the cavity containing it—(1) When the head begins to move, here the walls leave the fluid behind; (2) when the head stops, here the fluid flows on. In both cases the sensation of rotation is felt. In the first this sensation corresponds to a real rotation, in the second it does not, but in both it corresponds to a real acceleration (positive or negative) of rotation, using the word acceleration in its technical kinematical sense."

Cyon states that the semicircular canals only indirectly assist in giving a notion of spatial relations. "He holds that knowledge of the position of bodies in space depends on nervous impulses coming from the contracting ocular muscles; that the oculomotor centres are in intimate physiological relationship with the centres receiving impulses from the nerves of the semicircular canals; and that the oculomotor centres, thus excited, produce the movements of the eyeballs, which then determine our notions of spatial relations." These views are supported by experiments of Lee on dog-fish. When the fish is rotated round different axes there are compensating movements of the eyes and fins. "It was observed that if the fish were rotated in the plane of one of the canals, exactly the same movements of the eyes and fins occurred as were produced by experimental operation and stimulation of the ampulla of that canal." Sewall, in 1883, carried out experiments on young sharks and skates with negative results. Lee returned to the subject in 1894, and, after numerous experiments on dog-fish, in which the canals or the auditory nerves were divided, obtained evidence that the ampullae contain sense-organs connected with the sense of equilibrium.

It has been found by physicians and aurists that disease or injury of the canals, occurring rapidly, produces giddiness, staggering, nystagmus (a peculiar twitching movement of the muscles of the eyeballs), vomiting, noises in the ear and more or less deafness. It is said, however, that if pathological changes come on slowly, so that the canals and vestibule are converted into a solid mass, none of these symptoms may occur. On the whole, the evidence is in favour of the view that from the semicircular canals nervous impulses are transmitted, which, co-ordinated with impulses coming from the visual organs, from the muscles and from the skin, form the bases of these guiding sensations on which the sense of equilibrium depends. These impulses may not reach the level of consciousness, but they call into action co-ordinated mechanisms by which complicated muscular movements are effected.

Full bibliographical references are given in the article on "The Ear" by J.G. McKendrick, in Schäfer's *Textbook of Physiology*, vol. ii. p. 1194.

(J. G. M.)

EQUINOX (from the Lat. *aequus*, equal, and *nox*, night), a term used to express either the moment at which, or the point at which, the sun apparently crosses the celestial equator. Since the sun moves in the ecliptic, it is in the last-named sense the point of intersection of the ecliptic and the celestial equator. This is the usual meaning of the term in astronomy. There are two such points, opposite each other, at one of which the sun crosses the equator toward the north and at the other toward the south. They are called vernal and autumnal respectively, from the relation of the corresponding times to the seasons of the northern hemisphere. The line of the equinoxes is the imaginary diameter of the celestial sphere which joins them.

The vernal equinox is the initial point from which the right ascensions and the longitudes of the heavenly bodies are measured (see Astronomy: *Spherical*). It is affected by the motions of Precession and Nutation, of which the former has been known since the time of Hipparchus. The actual equinox is defined by first taking the conception of a fictitious point called the Mean Equinox, which moves at a nearly uniform rate, slow varying, however, from century to century. The true equinox then moves around the mean equinox in a period equal to that of the moon's nodes. These two motions are defined with greater detail in the articles Precession of the Equinoxes and Nutation.

Equinoctial Gales.—At the time of the equinox it is commonly believed that strong gales may be expected. This popular idea has no foundation in fact, for continued observations have failed to show any unusual prevalence of gales at this season. In one case observations taken for fifty years show that during the five days from the 21st to the 25th of March and September, there were fewer gales

and storms than during the preceding and succeeding five days.

EQUITES (“horsemen” or “knights,” from *equus*, “horse”), in Roman history, originally a division of the army, but subsequently a distinct political order, which under the empire resumed its military character. According to the traditional account, Romulus instituted a cavalry corps, consisting of three *centuriae* (“hundreds”), called after the three tribes from which they were taken (Ramnes, Tities, Luceres), divided into ten *turmae* (“squadrons”) of thirty men each. The collective name for the corps was *celeres* (“the swift,” or possibly from κέλης, “a riding horse”); Livy, however, restricts the term to a special body-guard of Romulus. The statements in ancient authorities as to the changes in the number of the equites during the regal period are very confusing; but it is regarded as certain that Servius Tuillus found six centuries in existence, to which he added twelve, making eighteen in all, a number which remained unchanged throughout the republican period. A proposal by M. Porcius Cato the elder to supplement the deficiency in the cavalry by the creation of four additional centuries was not adopted. The earlier centuries were called *sex suffragia* (“the six votes”), and at first consisted exclusively of patricians, while those of Servius Tullius were entirely or for the most part plebeian. Until the reform of the comitia centuriata (probably during the censorship of Gaius Flaminius in 220 B.C.; see COMITIA), the equites had voted first, but after that time this privilege was transferred to one century selected by lot from the centuries of the equites and the first class. The equites then voted with the first class, the distinction between the *sex suffragia* and the other centuries being abolished.

Although the equites were selected from the wealthiest citizens, service in the cavalry was so expensive that the state gave financial assistance. A sum of money (*aes equestre*) was given to each eques for the purchase of two horses (one for himself and one for his groom), and a further sum for their keep (*aes hordearium*); hence the name *equites equo publico*. In later times, pay was substituted for the *aes hordearium*, three times as much as that of the infantry. If competent, an eques could retain his horse and vote after the expiration of his ten years’ service, and (till 129 B.C.) even after entry into the senate.

As the demands upon the services of the cavalry increased, it was decided to supplement the regulars by the enrolment of wealthy citizens who kept horses of their own. The origin of these *equites equo privato* dates back, according to Livy (v. 7), to the siege of Veii, when a number of young men came forward and offered their services. According to Mommsen, although the institution was not intended to be permanent, in later times vacancies in the ranks were filled in this manner, with the result that service in the cavalry, with either a public or a private horse, became obligatory upon all Roman citizens possessed of a certain income. These *equites equo privato* had no vote in the centuries, received pay in place of the *aes equestre*, and did not form a distinct corps.

Thus, at a comparatively early period, three classes of equites may be distinguished: (*a*) The patrician equites *equo publico* of the *sex suffragia*; (*b*) the plebeian equites in the twelve remaining centuries; (*c*) the equites *equo privato*, both patrician and plebeian.

The equites were originally chosen by the curiae, then in succession by the kings, the consuls, and (after 443 B.C.) by the censors, by whom they were reviewed every five years in the Forum. Each eques, as his name was called out, passed before the censors, leading his horse. Those whose physique and character were satisfactory, and who had taken care of their horses and equipments, were bidden to lead their horse on (*traducere equum*), those who failed to pass the scrutiny were ordered to sell it, in token of their expulsion from the corps. This inspection (*recognitio*) must not be confounded with the full-dress procession (*transvectio*) on the 15th of July from the temple of Mars or Honos to the Capitol, instituted in 304 B.C. by the censor Q. Fabius Maximus Rullianus to commemorate the miraculous intervention of Castor and Pollux at the battle of Lake Regillus. Both inspection and procession were discontinued before the end of the republic, but revived and in a manner combined by Augustus.

In theory, the twelve plebeian centuries were open to all freeborn youths of the age of seventeen, although in practice preference was given to the members of the older families. Other requirements were sound health, high moral character and an honourable calling. At the beginning of the republican period, senators were included in the equestrian centuries. The only definite information as to the amount of fortune necessary refers to later republican and early imperial times, when it is known to have been 400,000 sesterces (about £3500 to £4000). The insignia of the equites were, at first, distinctly military—such as the purple-edged, short military cloak (*trabea*) and decorations for service in the field.

With the extension of the Roman dominions, the equites lost their military character. Prolonged service abroad possessed little attraction for the pick of the Roman youth, and recruiting for the cavalry from the equestrian centuries was discontinued. The equites remained at home, or only went out as members of the general’s staff, their places being taken by the *equites equo privato*, the cavalry of the allies and the most skilled horsemen of the subject populations. The first gradually

disappeared, and Roman citizens were rarely found in the ranks of the effective cavalry. In these circumstances there grew up in Rome a class of wealthy men, whose sole occupation it was to amass large fortunes by speculation, and who found a most lucrative field of enterprise in state contracts and the farming of the public revenues. These tax-farmers (see PUBLICANI) were already in existence at the time of the Second Punic War; and their numbers and influence increased as the various provinces were added to the Roman dominions. The change of the equites into a body of financiers was further materially promoted (*a*) by the lex Claudia (218 B.C.), which prohibited senators from engaging in commercial pursuits, especially if (as seems probable) it included public contracts (cf. FLAMINIUS, GAIUS); (*b*) by the enactment in the time of Gaius Gracchus excluding members of the senate from the equestrian centuries. These two measures definitely marked off the aristocracy of birth from the aristocracy of wealth—the landed proprietor from the capitalist. The term equites, originally confined to the purely military equestrian centuries of Servius Tullius, now came to be applied to all who possessed the property qualification of 400,000 sesterces.

As the equites practically monopolized the farming of the taxes, they came to be regarded as identical with the *publicani*, not, as Pliny remarks, because any particular rank was necessary to obtain the farming of the taxes, but because such occupation was beyond the reach of all except those who were possessed of considerable means. Thus, at the time of the Gracchi, these *equites-publicani* formed a close financial corporation of about 30,000 members, holding an intermediate position between the nobility and the lower classes, keenly alive to their own interests, and ready to stand by one another when attacked. Although to some extent looked down upon by the senate as following a dishonourable occupation, they had as a rule sided with the latter, as being at least less hostile to them than the democratic party. To obtain the support of the capitalists, Gaius Gracchus conceived the plan of creating friction between them and the senate, which he carried out by handing over to them the control (*a*) of the jury-courts, and (*b*) of the revenues of Asia.

(*a*) Hitherto, the list of jurymen for service in the majority of processes, both civil and criminal, had been composed exclusively of senators. The result was that charges of corruption and extortion failed, when brought against members of that order, even in cases where there was little doubt of their guilt. The popular indignation at such scandalous miscarriages of justice rendered a change in the composition of the courts imperative. Apparently Gracchus at first proposed to create new senators from the equites and to select the jurymen from this mixed body, but this moderate proposal was rejected in favour of one more radical (see W.W. Fowler in *Classical Review*, July 1896). By the lex Sempronia (123 B.C.) the list was to be drawn from persons of free birth over thirty years of age, who must possess the equestrian census, and must not be senators. Although this measure was bound to set senators and equites at variance, it in no way improved the lot of those chiefly concerned. In fact, it increased the burden of the luckless provincials, whose only appeal lay to a body of men whose interests were identical with those of the *publicani*. Provided he left the tax-gatherer alone, the governor might squeeze what he could out of the people, while on the other hand, if he were humanely disposed, it was dangerous for him to remonstrate.

(*b*) The taxes of Asia had formerly been paid by the inhabitants themselves in the shape of a fixed sum. Gracchus ordered that the taxes, direct and indirect, should be increased, and that the farming of them should be put up to auction at Rome. By this arrangement the provincials were ignored, and everything was left in the hands of the capitalists.

From this time dates the existence of the equestrian order as an officially recognized political instrument. When the control of the courts passed into the hands of the property equites, all who were summoned to undertake the duties of judices were called equites; the *ordo judicum* (the official title) and the *ordo equester* were regarded as identical. It is probable that certain privileges of the equites were due to Gracchus; that of wearing the gold ring, hitherto reserved for senators; that of special seats in the theatre, subsequently withdrawn (probably by Sulla) and restored by the lex Othonis (67 B.C.); the narrow band of purple on the tunic as distinguished from the broad band worn by the senators.

Various attempts were made by the senate to regain control of the courts, but without success. The lex Livia of M. Livius Drusus (*q.v.*), passed with that object, but irregularly and by the aid of violence, was annulled by the senate itself. In 82 Sulla restored the right of serving as judices to the senate, to which he elevated 300 of the most influential equites, whose support he thus hoped to secure; at the same time he indirectly dealt a blow at the order generally, by abolishing the office of the censor (immediately revived), in whom was vested the right of bestowing the public horse. To this period Mommsen assigns the regulation, generally attributed to Augustus, that the sons of senators should be knights by right of birth. By the lex Aurelia (70 B.C.) the judices were to be chosen in equal numbers from senators, equites and tribuni aerarii (see AERARIUM), (the last-named being closely connected with the equites), who thus practically commanded a majority. About this time the influence of the equestrian order reached its height, and Cicero's great object was to reconcile it with the senate. In this he was successful at the time of the Catilinarian conspiracy, in the suppression of which he was materially aided by the equites. But the union did not last long; shortly afterwards the majority ranged themselves on the side of Julius Caesar, who did away with the tribuni aerarii as judices, and replaced them by equites.

Augustus undertook the thorough reorganization of the equestrian order on a military basis. The *equites equo privato* were abolished (according to Herzog, not till the reign of Tiberius) and the term

equites was officially limited to the *equites equo publico*, although all who possessed the property qualification were still considered to belong to the "equestrian order." For the *equites equo publico* high moral character, good health and the equestrian fortune were necessary. Although free birth was considered indispensable, the right of wearing the gold ring (*jus anuli aurei*) was frequently bestowed by the emperor upon freedmen, who thereby became *ingenui* and eligible as equites. Tiberius, however, insisted upon free birth on the father's side to the third generation. Extreme youth was no bar; the emperor Marcus Aurelius had been an eques at the age of six. The sons of senators were eligible by right of birth, and appear to have been known as *equites illustres*. The right of bestowing the *equus publicus* was vested in the emperor; once given, it was for life, and was only forfeitable through degradation for some offence or the loss of the equestrian fortune.

Augustus divided the equites into six *turmae* (regarded by Hirschfeld as a continuation of the *sex suffragia*). Each was under the command of a *sevir* (ἴλαρχος), who was appointed by the emperor and changed every year. During their term of command the *seviri* had to exhibit games (*ludi sevirales*). Under these officers the equites formed a kind of corporation, which, although not officially recognized, had the right of passing resolutions, chiefly such as embodied acts of homage to the imperial house. It is not known whether the *turmae* contained a fixed number of equites; there is no doubt that, in assigning the public horse, Augustus went far beyond the earlier figure of 1800. Thus, Dionysius of Halicarnassus mentions 5000 equites as taking part in a review at which he himself was present.

As before, the equites wore the narrow, purple-striped tunic, and the gold ring, the latter now being considered the distinctive badge of knighthood. The fourteen rows in the theatre were extended by Augustus to seats in the circus.

The old *recognitio* was replaced by the *probatio*, conducted by the emperor in his censorial capacity, assisted by an advisory board of specially selected senators. The ceremony was combined with a procession, which, like the earlier *transvectio*, took place on the 15th of July, and at such other times as the emperor pleased. As in earlier times, offenders were punished by expulsion.

In order to provide a supply of competent officers, each eques was required to fill certain subordinate posts, called *militiae equestres*. These were (1) the command of an auxiliary cohort; (2) the tribunate of a legion; (3) the command of an auxiliary cavalry squadron, this order being as a rule strictly adhered to. To these Septimius Severus added the centurionship. Nomination to the *militiae equestres* was in the hands of the emperor. After the completion of their preliminary military service, the equites were eligible for a number of civil posts, chiefly those with which the emperor himself was closely concerned. Such were various procuratorships; the prefectures of the corn supply, of the fleet, of the watch, of the praetorian guards; the governorships of recently acquired provinces (Egypt, Noricum), the others being reserved for senators. At the same time, the abolition of the indirect method of collecting the taxes in the provinces greatly reduced the political influence of the equites. Certain religious functions of minor importance were also reserved for them. In the jury courts, the equites, thanks to Julius Caesar, already formed two-thirds of the judices; Augustus, by excluding the senators altogether, virtually gave them the sole control of the tribunals. One of the chief objects of the emperors being to weaken the influence of the senate by the opposition of the equestrian order, the practice was adopted of elevating those equites who had reached a certain stage in their career to the rank of senator by *adlectio*. Certain official posts, of which it would have been inadvisable to deprive senators, could thus be bestowed upon the promoted equites.

The control of the imperial correspondence and purse was at first in the hands of freedmen and slaves. The emperor Claudius tentatively entrusted certain posts connected with these to the equites; in the time of Hadrian this became the regular custom. Thus a civil career was open to the equites without the obligation of preliminary military service, and the emperor was freed from the pernicious influence of freedmen. After the reign of Marcus Aurelius (according to Mommsen) the equites were divided into: (*a*) *viri eminentissimi*, the prefects of the praetorian guard; (*b*) *viri perfectissimi*, the other prefects and the heads of the financial and secretarial departments; (*c*) *viri egregii*, first mentioned in the reign of Antoninus Pius, a title by right of the procurators generally.

Under the empire the power of the equites was at its highest in the time of Diocletian; in consequence of the transference of the capital to Constantinople, they sank to the position of a mere city guard, under the control of the prefect of the watch. Their history may be said to end with the reign of Constantine the Great.

Mention may also be made of the *equites singulares Augusti*. The body-guard of Augustus, consisting of foreign soldiers (chiefly Germans and Batavians), abolished by Galba, was revived from the time of Trajan or Hadrian under the above title. It was chiefly recruited from the pick of the provincial cavalry, but contained some Roman citizens. It formed the imperial "Swiss guard," and never left the city except to accompany the emperor. In the time of Severus, these equites were divided into two corps, each of which had its separate quarters, and was commanded by a tribune under the orders of the prefect of the praetorian guard. They were subsequently replaced by the *protectores Augusti*.

See further article ROME: *History*; also T. Mommsen, *Römisches Staatsrecht*, iii.; J.N. Madvig, *Die Verfassung des römischen Staates*, i.; R. Cagnat in Daremberg and Saglio's *Dictionnaire des antiquités*, where full references to ancient authorities are given in the footnotes; A.S. Wilkins in

Smith's *Dictionary of Greek and Roman Antiquities* (3rd ed., 1891); E. Belot, *Histoire des chevaliers romains* (1866-1873); H.O. Hirschfeld, *Untersuchungen auf dem Gebiete der römischen Verwaltungsgeschichte* (Berlin, 1877); E. Herzog, *Geschichte und System der römischen Staatsverfassung* (Leipzig, 1884-1891); A.H. Friedländer, *Sittengeschichte Roms*, i. (1901); A.H.J. Greenidge, *History of Rome*, i. (1904); J.B. Bury, *The Student's Roman Empire* (1893); T.M. Taylor, *Political and Constitutional History of Rome* (1899). For a concise summary of different views of the *sex suffragia* see A. Bouché-Leclercq's *Manuel des antiquités romaines*, quoted in Daremberg and Saglio; and on the *equites singulares*, T. Mommsen in *Hermes*, xvi. (1881), p. 458.

(J. H. F.)

EQUITY (Lat. *aequitas*), a term which in its most general sense means equality or justice; in its most technical sense it means a system of law or a body of connected legal principles, which have superseded or supplemented the common law on the ground of their intrinsic superiority. Aristotle (*Ethics*, bk. v. c. 10) defines equity as a better sort of justice, which corrects legal justice where the latter errs through being expressed in a universal form and not taking account of particular cases. When the law speaks universally, and something happens which is not according to the common course of events, it is right that the law should be modified in its application to that particular case, as the lawgiver himself would have done, if the case had been present to his mind. Accordingly the equitable man (ἐπιεικής) is he who does not push the law to its extreme, but, having legal justice on his side, is disposed to make allowances. Equity as thus described would correspond rather to the judicial discretion which modifies the administration of the law than to the antagonistic system which claims to supersede the law.

The part played by equity in the development of law is admirably illustrated in the well-known work of Sir Henry Maine on *Ancient Law*. Positive law, at least in progressive societies, is constantly tending to fall behind public opinion, and the expedients adopted for bringing it into harmony therewith are three, viz. legal fictions, equity and statutory legislation. Equity here is defined to mean "any body of rules existing by the side of the original civil law, founded on distinct principles, and claiming incidentally to supersede the civil law in virtue of a superior sanctity inherent in those principles." It is thus different from legal fiction, by which a new rule is introduced surreptitiously, and under the pretence that no change has been made in the law, and from statutory legislation, in which the obligatory force of the rule is not supposed to depend upon its intrinsic fitness. The source of Roman equity was the fertile theory of natural law, or the law common to all nations. Even in the Institutes of Justinian the distinction is carefully drawn in the laws of a country between those which are peculiar to itself and those which natural reason appoints for all mankind. The connexion in Roman law between the ideas of equity, nature, natural law and the law common to all nations, and the influence of the Stoical philosophy on their development, are fully discussed in the third chapter of the work we have referred to. The agency by which these principles were introduced was the edicts of the praetor, an annual proclamation setting forth the manner in which the magistrate intended to administer the law during his year of office. Each successive praetor adopted the edict of his predecessor, and added new equitable rules of his own, until the further growth of the irregular code was stopped by the praetor Salvius Julianus in the reign of Hadrian.

The place of the praetor was occupied in English jurisprudence by the lord high chancellor. The real beginning of English equity is to be found in the custom of handing over to that officer, for adjudication, the complaints which were addressed to the king, praying for remedies beyond the reach of the common law. Over and above the authority delegated to the ordinary councils or courts, a reserve of judicial power was believed to reside in the king, which was invoked as of grace by the suitors who could not obtain relief from any inferior tribunal. To the chancellor, as already the head of the judicial system, these petitions were referred, although he was not at first the only officer through whom the prerogative of grace was administered. In the reign of Edward III. the equitable jurisdiction of the court appears to have been established. Its constitutional origin was analogous to that of the star chamber and the court of requests. The latter, in fact, was a minor court of equity attached to the lord privy seal as the court of chancery was to the chancellor. The successful assumption of extraordinary or equitable jurisdiction by the chancellor caused similar pretensions to be made by other officers and courts. "Not only the court of exchequer, whose functions were in a peculiar manner connected with royal authority, but the counties palatine of Chester, Lancaster and Durham, the court of great session in Wales, the universities, the city of London, the Cinque Ports and other places silently assumed extraordinary jurisdiction similar to that exercised in the court of chancery." Even private persons, lords and ladies, affected to establish in their honours courts of equity.

English equity has one marked historical peculiarity, viz. that it established itself in a set of independent tribunals which remained in standing contrast to the ordinary courts for many hundred years. In Roman law the judge gave the preference to the equitable rule; in English law the equitable rule was enforced by a distinct set of judges. One cause of this separation was the rigid adherence to precedent on the part of the common law courts. Another was the jealousy prevailing in England against the principles of the Roman law on which English equity to a large extent was founded.

When a case of prerogative was referred to the chancellor in the reign of Edward III., he was required to grant such remedy as should be consonant to honesty (*honestas*). And honesty, conscience and equity were said to be the fundamental principles of the court. The early chancellors were ecclesiastics, and under their influence not only moral principles, where these were not regarded by the common law, but also the equitable principles of the Roman law were introduced into English jurisprudence. Between this point and the time when equity became settled as a portion of the legal system, having fixed principles of its own, various views of its nature seem to have prevailed. For a long time it was thought that precedents could have no place in equity, inasmuch as it professed in each case to do that which was just; and we find this view maintained by common lawyers after it had been abandoned by the professors of equity themselves. G. Spence, in his book on the *Equitable Jurisdiction of the Court of Chancery*, quotes a case in the reign of Charles II., in which chief justice Vaughan said: 727

> "I wonder to hear of citing of precedents in matter of equity, for if there be equity in a case, that equity is an universal truth, and there can be no precedent in it; so that in any precedent that can be produced, if it be the same with this case, the reason and equity is the same in itself; and if the precedent be not the same case with this it is not to be cited."

But the lord keeper Bridgeman answered:

> "Certainly precedents are very necessary and useful to us, for in them we may find the reasons of the equity to guide us, and besides the authority of those who made them is much to be regarded. We shall suppose they did it upon great consideration and weighing of the matter, and it would be very strange and very ill if we should disturb and set aside what has been the course for a long series of times and ages."

Selden's description is well known: "Equity is a roguish thing. 'Tis all one as if they should make the standard for measure the chancellor's foot." Lord Nottingham in 1676 reconciled the ancient theory and the established practice by saying that the conscience which guided the court was not the natural conscience of the man, but the civil and political conscience of the judge. The same tendency of equity to settle into a system of law is seen in the recognition of its limits—in the fact that it did not attempt in all cases to give a remedy when the rule of the common law was contrary to justice. Cases of hardship, which the early chancellors would certainly have relieved, were passed over by later judges, simply because no precedent could be found for their interference. The point at which the introduction of new principles of equity finally stopped is fixed by Sir Henry Maine in the chancellorship of Lord Eldon, who held that the doctrines of the court ought to be as well settled and made as uniform almost as those of the common law. From that time certainly equity, like common law, has professed to take its principles wholly from recorded decisions and statute law. The view (traceable no doubt to the Aristotelian definition) that equity mitigates the hardships of the law where the law errs through being framed in universals, is to be found in some of the earlier writings. Thus in the *Doctor and Student* it is said:

> "Law makers take heed to such things as may often come, and not to every particular case, for they could not though they would; therefore, in some cases it is necessary to leave the words of the law and follow that reason and justice requireth, and to that intent equity is ordained, that is to say, to temper and mitigate the rigour of the law."

And Lord Ellesmere said:

> "The cause why there is a chancery is for that men's actions are so divers and infinite that it is impossible to make any general law which shall aptly meet with every particular act and not fail in some circumstances."

Modern equity, it need hardly be said, does not profess to soften the rigour of the law, or to correct the errors into which it falls by reason of its generality.

To give any account, even in outline, of the subject matter of equity within the necessary limits of this article would be impossible. It will be sufficient to say here that the classification generally adopted by text-writers is based upon the relations of equity to the common law, of which some explanation is given above. Thus equitable jurisdiction is said to be exclusive, concurrent or auxiliary. Equity has *exclusive* jurisdiction where it recognizes rights which are unknown to the common law. The most important example is trusts. Equity has *concurrent* jurisdiction in cases where the law recognized the right but did not give adequate relief, or did not give relief without circuity of action or some similar inconvenience. And equity has *auxiliary* jurisdiction when the machinery of the courts of law was unable to procure the necessary evidence.

"The evils of this double system of judicature," says the report of the judicature commission (1863-1867), "and the confusion and conflict of jurisdiction to which it has led, have been long known and acknowledged." A partial attempt to meet the difficulty was made by several acts of parliament (passed after the reports of commissions appointed in 1850 and 1851), which enabled courts of law and equity both to exercise certain powers formerly peculiar to one or other of them. A more complete remedy was introduced by the Judicature Act 1873, which consolidated the courts of law and equity, and ordered that law and equity should be administered concurrently according to the rules contained in the 26th section of the act. At the same time many matters of equitable jurisdiction are still left to the chancery division of the High Court in the first instance. (See Chancery.)

AUTHORITIES.—The principles of equity as set out by the following writers may be consulted: J. Story, J.W. Smith, H.A. Smith and W. Ashburner; and for the history see G. Spence, *The Equitable Jurisdiction of the Court of Chancery* (2 vols., 1846-1849); D.M. Kerly, *Historical Sketch of the Equitable Jurisdiction of the Court of Chancery* (1890).

EQUIVALENT, in chemistry, the proportion of an element which will combine with or replace unit weight of hydrogen. When multiplied by the valency it gives the atomic weight. The determination of equivalent weights is treated in the article STOICHIOMETRY. (See also CHEMISTRY.) In a more general sense the term "equivalent" is used to denote quantities of substances which neutralize one another, as for example NaOH, HCl, $\frac{1}{2}H_2SO_4$, $\frac{1}{2}Ba(OH)_2$.

ÉRARD, SÉBASTIEN (1752-1831), French manufacturer of musical instruments, distinguished especially for the improvements he made upon the harp and the pianoforte, was born at Strassburg on the 5th of April 1752. While a boy he showed great aptitude for practical geometry and architectural drawing, and in the workshop of his father, who was an upholsterer, he found opportunity for the early exercise of his mechanical ingenuity. When he was sixteen his father died, and he removed to Paris where he obtained employment with a harpsichord maker. Here his remarkable constructive skill, though it speedily excited the jealousy of his master and procured his dismissal, almost equally soon attracted the notice of musicians and musical instrument makers of eminence. Before he was twenty-five he set up in business for himself, his first workshop being a room in the hotel of the duchesse de Villeroi, who gave him warm encouragement. Here he constructed in 1780 his first pianoforte, which was also one of the first manufactured in France. It quickly secured for its maker such a reputation that he was soon overwhelmed with commissions, and finding assistance necessary, he sent for his brother, Jean Baptiste, in conjunction with whom he established in the rue de Bourbon, in the Faubourg St Germain, a piano manufactory, which in a few years became one of the most celebrated in Europe. On the outbreak of the Revolution he went to London where he established a factory. Returning to Paris in 1796, he soon afterwards introduced grand pianofortes, made in the English fashion, with improvements of his own. In 1808 he again visited London, where, two years later, he produced his first double-movement harp. He had previously made various improvements in the manufacture of harps, but the new instrument was an immense advance upon anything he had before produced, and obtained such a reputation that for some time he devoted himself exclusively to its manufacture. It has been said that in the year following his invention he made harps to the value of £25,000. In 1812 he returned to Paris, and continued to devote himself to the further perfecting of the two instruments with which his name is associated. In 1823 he crowned his work by producing his model grand pianoforte with the double escapement. Érard died at Passy, on the 5th of August 1831. (See also HARP and PIANOFORTE.)

ERASMUS, DESIDERIUS (1466-1536), Dutch scholar and theologian, was born on the night of the 27/28th of October, probably in 1466; but his statements about his age are conflicting, and in view of his own uncertainty (*Ep.* x. 29: 466) and the weakness of his memory for dates, the year of his birth cannot be definitely fixed. His father's name seems to have been Rogerius Gerardus. He himself was christened Herasmus; but in 1503, when becoming familiar with Greek, he assimilated the name to a fancied Greek original, which he had a few years before Latinized into Desyderius. A contemporary authority states that he was born at Gouda, his father's native town; but he adopted the style *Rotterdammensis* or *Roterodamus*, in accordance with a story to which he himself gave credence. His first schooling was at Gouda under Peter Winckel, who was afterwards vice-pastor of the church. In the dull round of instruction in "grammar" he did not distinguish himself, and was surpassed by his early friend and companion, William Herman, who was Winckel's favourite pupil. From Gouda the two boys went to the school attached to St Lebuin's church at Deventer, which was one of the first in northern Europe to feel the influence of the Renaissance. Erasmus was at Deventer from 1475 to 1484, and when he left, had learnt from Johannes Sinthius (Syntheim) and Alexander Hegius, who had come as headmaster in 1483, the love of letters which was the ruling passion of his life. At some period, perhaps in an interval of his time at Deventer, he was a chorister at Utrecht under the famous organist of the cathedral, Jacob Obrecht.

About 1484 Erasmus' father died, leaving him and an elder brother Peter, both born out of wedlock,

to the care of guardians, their mother having died shortly before. Erasmus was eager to go to a university, but the guardians, acting under a perhaps genuine enthusiasm for the religious life, sent the boys to another school at Hertogenbosch; and when they returned after two or three years, prevailed on them to enter monasteries. Peter went to Sion, near Delft; Erasmus after prolonged reluctance became an Augustinian canon in St Gregory's at Steyn, a house of the same Chapter near Gouda. There he found little religion and less refinement; but no serious difficulty seems to have been made about his reading the classics and the Fathers with his friends to his heart's content. The monastery once entered, there was no drawing back; and Erasmus passed through the various stages which culminated in his ordination as priest on the 25th of April 1492.

But his ardent spirit could not long be content with monastic life. He brought his attainments somehow to the notice of Henry of Bergen, bishop of Cambrai, the leading prelate at the court of Brussels; and about 1494 permission was obtained for him to leave Steyn and become Latin secretary to the bishop, who was then preparing for a visit to Rome. But the journey was abandoned, and after some months Erasmus found that even with occasional chances to read at Groenendael, the life of a court was hardly more favourable to study than that of Steyn. At the suggestion of a friend, James Batt, he applied to his patron for leave to go to Paris University. The bishop consented and promised a small pension; and in August 1495 Erasmus entered the "domus pauperum" of the college of Montaigu, which was then under the somewhat rigid rule of the reformer Jan Standonck. He at once introduced himself to the distinguished French historian and diplomatist Robert Gaguin (1425-1502) and published a small volume of poems; and he became intimate with Johann Mauburnus (Mombaer), the leader of a mission summoned from Windesheim in 1496 to reform the abbey of Château-Landon. But the life at Montaigu was too hard for him. Every Lent he fell ill and had to return to Holland to recover. He continued to read nevertheless for a degree in theology, and at some time completed the requirements for the B.D. After a year or two he left Montaigu and eked out his money from the bishop by taking pupils. One of these, a young Englishman, William Blount, 4th Baron Mountjoy (d. 1534), persuaded him to visit England in the spring of 1499.

Being without a benefice, he had no settled income to look to, and apart from the precarious profits of teaching and writing books, could only wait on the generosity of patrons to supply him with the leisure he craved. The faithful Batt had sought a pension for him from his own patroness, Anne of Borsselen, the Lady of Veere, who resided at the castle of Tournehem near Calais, and whose son Batt was now teaching. But as nothing promised at once, Erasmus accepted Mountjoy's offer, and thus a tie was formed which led Mountjoy then or a few years later to grant him a pension of £20 for life. Otherwise the visit to England gave no hope of preferment; and in the summer Erasmus prepared to leave. He was delayed, and used the interval to spend two or three months at Oxford, where he found John Colet lecturing on the Epistle to the Romans. Discussions between them on theological questions soon convinced Colet of Erasmus' worth, and he sought to persuade him to stay and teach at Oxford. But Erasmus could not be content with the Bible in Latin. Oxford could teach him no Greek, so away he must go.

In January 1500 he returned to Paris, which though it could offer no Greek teacher better than George Hermonymus, was at least a better centre for buying and for printing books. The next few years were spent still in preparation, supported by pupils' fees and the dedications of books; the *Collectanea adagiorum* in June 1500 to Mountjoy, and some devotional and moral compositions to Batt's patroness and her son. When the plague drove him from Paris, he went to Orleans or Tournehem or St Omer, as the way opened. From 1502 to 1504 he was at Louvain, still declining to teach publicly; among his friends being the future Pope Adrian VI. In January 1504 the archduke Philip gave him fifty livres for the Panegyric which "*ung religieux de l'ordre de St Augustin*" had composed on his Spanish journey; and in October, ten more, for the maintenance of his studies.

He had been working hard at Greek, of which he now felt himself master, at the Fathers (above all at Jerome), and at the Epistles of St Paul, fulfilling the promise made to Colet in Oxford, to give himself to sacred learning. But the bent of his reading is shown by the manuscript with which he returned to Paris at the close of 1504—Valla's *Annotations on the New Testament*, which Badius printed for him in 1505.

Shortly afterwards Lord Mountjoy invited him again to England, and this visit was more successful. He found in London a circle of learned friends through whom he was introduced to William Warham, archbishop of Canterbury, Richard Foxe, bishop of Winchester and other dignitaries. John Fisher (bishop of Rochester), who was then superintending the foundation of Christ's College for the Lady Margaret, took him down to Cambridge for the king's visit; and at length the opportunity came to fulfil his dream of seeing Italy. Baptista Boerio, the king's physician, engaged him to accompany his two sons thither as supervisor of their studies. In September 1506 he set foot on that sacred soil, and took his D.D. at Turin. For a year he remained with his pupils at Bologna, and then, his engagement completed, negotiated with Aldus Manutius for a new edition of his *Adagia* upon a very different scale. The volume of 1500 had been jejune, written when he knew nothing of Greek; 800 adages put together with scanty elucidations. In 1508 he had conceived a work on lines more to the taste of the learned world, full of apt and recondite learning, and now and again relieved by telling comments or lively anecdotes. Three thousand and more collected justified a new title—*Chiliades adagiorum*; and the author's reputation was now established. So secure in public favour did the book in time become, that the council of Trent, unable to suppress it and not daring to overlook it, ordered the preparation of a castrated edition.

To print the *Adagia* he had gone to Venice, where he lived with Andrea Torresano of Asola (Asulanus) and did the work of two men, writing and correcting proof at the same time. When it was finished, with an ample re-dedication to Mountjoy, a new pupil presented himself, Alexander Stewart, natural son of James IV. of Scotland—perhaps through a connexion formed in early days at Paris. They went together to Siena and Rome and then on to Campania, thirsty under the summer sun. When they returned to Rome, his pupil departed to Scotland, to fall a few years later by his father's side at Flodden; Erasmus also found a summons to call him northwards.

On the death of Henry VII. Lord Mountjoy, who had been companion to Prince Henry in his studies, had become a person of influence. He wrote to Erasmus of a land flowing with milk and honey under the "divine" young king, and with Warham sent him £10 for journey money. At first Erasmus hesitated. He had been disappointed in Italy, to find that he had not much to learn from its famed scholarship; but he had made many friends in Aldus's circle—Marcus Musurus, John Lascaris, 729
Baptista Egnatius, Paul Bombasius, Scipio Carteromachus; and his reception had been flattering, especially in Rome, where cardinals had delighted to honour him. But to remain in Rome was to sell himself. He might have the leisure which was so indispensable, but at price of the freedom to read, think, write what he liked. He decided, therefore, to go, though with regrets; which returned upon him sometimes in after years, when the English hopes had not borne fruit.

In the autumn he reached London, and in Thomas More's house in Bucklersbury wrote the witty satire which Milton found "in every one's hands" at Cambridge in 1628, and which is read to this day. The *Moriae encomium* was a sign of his decision. In it kings and princes, bishops and popes alike are shown to be in bondage to Folly; and no class of men is spared. Its author was willing to be beholden to any one for leisure; but he would be no man's slave. For the next eighteen months he is entirely lost to view; when he reappears in April 1511, he is leaving More's house and taking the *Moria* to be printed privily in Paris. Wherever they were spent, these must have been months of hard work, as were the years that followed. His time was now come. The long preparation and training, bought by privation and uncongenial toil, was over, and he was ready to apply himself to the scientific study of sacred letters. His English patrons were liberal. Fisher sent him in August 1511 to teach in Cambridge; Warham gave him a benefice, Aldington in Kent, worth *£*33, 6*s.* 8*d.* a year, and in violation of his own rule commuted it for a pension of £20 charged on the living; and the dedications of his books were fruitful. In Cambridge he completed his work on the New Testament, the Letters of Jerome, and Seneca; and then in 1514, when there seemed no prospect of ampler preferment, he determined to transfer himself to Basel and give the results of his labours to the world.

The origin of Erasmus's connexion with Johann Froben is not clear. In 1511 he was preparing to reprint his *Adagia* with Jodocus Badius, who in the following year was to have also Seneca and Jerome. But in 1513 Froben, who had just reprinted the Aldine *Adagia*, acquired through a bookseller-agent Erasmus' amended copy which had been destined for Badius. That the agent was acting entirely on his own responsibility may be doubted; for within a few months Erasmus had decided to betake himself to Basel, bearing with him Seneca and Jerome, the latter to be incorporated in the great edition which Johannes Amerbach and Froben had had in hand since 1510. In Germany he was widely welcomed. The Strassburg Literary Society fêted him, and Johannes Sapidus, headmaster of the Latin school at Schlettstadt, rode with him into Basel. Froben received him with open arms, and the presses were soon busy with his books. Through the winter of 1514-1515 Erasmus worked with the strength of ten; and after a brief visit to England in the spring, the New Testament was set up. Around him was a circle of students, some young, some already distinguished—the three sons of Froben's partner, Johannes Amerbach, who was now dead, Beatus Rhenanus, Wilhelm Nesen, Ludwig Ber, Heinrich Glareanus, Nikolaus Gerbell, Johannes Oecolampadius—who looked to him as their head and were proud to do him service.

Though from this time forward Basel became the centre of occupation and interest for Erasmus, yet for the next few years he was mainly in the Netherlands. On the completion of the New Testament in 1516 he returned to his friends in England; but his appointment, then recent, as councillor to the young king Charles, brought him back to Brussels in the autumn. In the spring of 1517 he went for the last time to England, about a dispensation from wearing his canonical dress, obtained originally from Julius II. and recently confirmed by Leo X., and in May 1518 he journeyed to Basel for three months to set the second edition of the New Testament in progress. But with these exceptions he remained in proximity to the court, living much at Louvain, where he took great interest in the foundation of Hieronymus Busleiden's Collegium Trilingue. His circumstances had improved so much, by pensions, the presents which were showered upon him, and the sale of his books, that he was now in a position to refuse all proposals which would have interfered with his cherished independence. The general ardour for the restoration of the arts and of learning created an aristocratic public, of which Erasmus was supreme pontiff. Luther spoke to the people and the ignorant; Erasmus had the ear of the educated class. His friends and admirers were distributed over all the countries of Europe, and presents were continually arriving from small as well as great, from a donation of 200 florins, made by Pope Clement VII., down to sweetmeats and comfits contributed by the nuns of Cologne (*Ep.* 666). From England, in particular, he continued to receive supplies of money. In the last year of his life Thomas Cromwell sent him 20 angels, and Archbishop Cranmer 18. Though Erasmus led a very hard-working and far from luxurious life, and had no extravagant habits, yet he could not live upon little. The excessive delicacy of his constitution, not pampered appetite, exacted some unusual indulgences. He could not bear the stoves of Germany, and required an open fireplace in the room in

which he worked. He was afflicted with the stone, and obliged to be particular as to what he drank. Beer he could not touch. The white wines of Baden or the Rhine did not suit him; he could only drink those of Burgundy or Franche-Comté. He could neither eat, nor bear the smell of, fish. “His heart,” he said, “was Catholic, but his stomach was Lutheran.” For his constant journeys he required two horses, one for himself and one for his attendant. And though he was almost always found in horse-flesh by his friends, the keep had to be paid for. For his literary labours and his extensive correspondence he required one or more amanuenses. He often had occasion, on his own business, or on that of Froben’s press, to send special couriers to a distance, employing them by the way in collecting the free gifts of his tributaries.

Precarious as these means of subsistence seem, he preferred the independence thus obtained to an assured position which would have involved obligations to a patron or professional duties which his weak health would have made onerous. The duke of Bavaria offered to dispense with teaching, if he would only reside, and would have named him on these terms to a chair in his new university of Ingolstadt, with a salary of 200 ducats, and the reversion of one or more prebendal stalls. The archduke Ferdinand offered a pension of 400 florins, if he would only come to reside at Vienna. Adrian VI. offered him a deanery, but the offer seems to have been of a possible and not an actual deanery. Offers, flattering but equally vague, were made from France, on the part of the bishop of Bayeux, and even of Francis I. “Invitor amplissimis conditionibus; offeruntur dignitates et episcopatus; plane rex essem, si juvenis essem” (*Ep.* xix. 106; 735). Erasmus declined all, and in November 1521 settled permanently at Basel, in the capacity of general editor and literary adviser of Froben’s press. As a subject of the emperor, and attached to his court by a pension, it would have been convenient to him to have fixed his residence in Louvain. But the bigotry of the Flemish clergy, and the monkish atmosphere of the university of Louvain, overrun with Dominicans and Franciscans, united for once in their enmity to the new classical learning, inclined Erasmus to seek a more congenial home in Basel. To Froben his arrival was the advent of the very man whom he had long wanted. Froben’s enterprise, united with Erasmus’s editorial skill, raised the press of Basel, for a time, to be the most important in Europe. The death of Froben in 1527, the final separation of Basel from the Empire, the wreck of learning in the religious disputes, and the cheap paper and scamped work of the Frankfort presses, gradually withdrew the trade from Basel. But during the years of Erasmus’s co-operation the Froben press took the lead of all the presses in Europe, both in the standard value of the works published and in style of typographical execution. Like some other publishers who preferred reputation to returns in money, Froben died poor, and his impressions never reached the splendour afterwards attained by those of the Estiennes, or of Plantin. The series of the Fathers alone contains Jerome (1516), Cyprian (1520), Pseudo-Arnobius (1522), Hilarius (1523), Irenaeus (Latin, 1526), Ambrose (1527), Augustine (1528), Chrysostom (Latin, 1530), Basil (Greek, 1532, the first Greek author printed in Germany), and Origen (Latin, 1536). In these editions, partly texts, partly translations, it is impossible to determine the respective shares of Erasmus and his many helpers. The prefaces and dedications are all written by him, and some of them, as that to the Hilarius, are of importance for the history as well of the times as of Erasmus himself. Of his most important edition, that of the Greek text of the New Testament, something will be said farther on.

In this “mill,” as he calls it, Erasmus continued to grind incessantly for eight years. Besides his work as editor, he was always writing himself some book or pamphlet called for by the event of the day, some general fray in which he was compelled to mingle, or some personal assault which it was necessary to repel. But though painfully conscious how much his reputation as a writer was damaged by this extempore production, he was unable to resist the fatal facility of print. He was the object of those solicitations which always beset the author whose name upon the title page assures the sale of a book. He was besieged for dedications, and as every dedication meant a present proportioned to the circumstances of the dedicatee, there was a natural temptation to be lavish of them. Add to this a correspondence so extensive as to require him at times to write forty letters in one day. “I receive daily,” he writes, “letters from remote parts, from kings, princes, prelates and men of learning, and even from persons of whose existence I was ignorant.” His day was thus one of incessant mental activity; but hard work was so far from breeding a distaste for his occupation, that reading and writing grew ever more delightful to him (*literarum assiduitas non modo mihi fastidium non parit, sed voluptatem; crescit scribendo scribendi studium*).

Shortly after Froben’s death the disturbances at Basel, occasioned by the zealots for the religious revolution which was in progress throughout Switzerland, began to make Erasmus desirous of changing his residence. He selected Freiburg in the Breisgau, as a city which was still in the dominion of the emperor, and was free from religious dissension. Thither he removed in April 1529. He was received with public marks of respect by the authorities, who granted him the use of an unfinished residence which had been begun to be built for the late emperor Maximilian. Erasmus proposed only to remain at Freiburg for a few months, but found the place so suited to his habits that he bought a house of his own, and remained there six years. A desire for change of air—he fancied Freiburg was damp—rumours of a new war with France, and the necessity of seeing his *Ecclesiastes* through the press, took him back to Basel in 1535. He lived now a very retired life, and saw only a small circle of intimate friends. A last attempt was made by the papal court to enlist him in some public way against the Reformation. On the election of Paul III. in 1534, he had, as usual, sent the new pope a congratulatory letter. After his arrival in Basel, he received a complimentary answer, together with the nomination to the deanery of Deventer, the income of which was reckoned at 600 ducats. This nomination was accompanied with an intimation that more was in store for him, and that

steps would be taken to provide for him the income, viz., 3000 ducats, which was necessary to qualify for the cardinal's hat. But Erasmus was even less disposed now than he had been before to barter his reputation for honours. His health had been for some years gradually declining, and disease in the shape of gout gaining upon him. In the winter of 1535-1536 he was confined entirely to his chamber, many days to his bed. Though thus afflicted he never ceased his literary activity, dictating his tract *On the Purity of the Church*, and revising the sheets of a translation of Origen which was passing through the Froben press. His last letter is dated the 28th of June 1536, and subscribed "Eras. Rot. aegra manu." "I have never been so ill in my life before as I am now,—for many days unable even to read." Dysentery setting in carried him off on the 12th of July 1536, in his 70th year.

By his will, made on the 12th of February 1536, he left what he had to leave, with the exception of some legacies, to Bonifazius Amerbach, partly for himself, partly in trust for the benefit of the aged and the infirm, or to be spent in portioning young girls, and in educating young men of promise. He left none of the usual legacies for masses or other clerical purposes, and was not attended by any priest or confessor in his last moments.

Erasmus's features are familiar to all, from Holbein's many portraits or their copies. Beatus Rhenanus, "summus Erasmi observator," as he is called by de Thou, describes his person thus: "In stature not tall, but not noticeably short; in figure well built and graceful; of an extremely delicate constitution, sensitive to the slightest changes of climate, food or drink. After middle life he suffered from the stone, not to mention the common plague of studious men, an irritable mucous membrane. His complexion was fair; light blue eyes, and yellowish hair. Though his voice was weak, his enunciation was distinct; the expression of his face cheerful; his manner and conversation polished, affable, even charming." His highly nervous organization made his feelings acute, and his brain incessantly active. Through his ready sympathy with all forms of life and character, his attention was always alive. The active movement of his spirit spent itself, not in following out its own trains of thought, but in outward observation. No man was ever less introspective, and though he talks much of himself, his egotism is the genial egotism which takes the world into its confidence, not the selfish egotism which feels no interest but in its own woes. He says of himself, and justly, "that he was incapable of dissimulation" (*Ep.* xxvi. 19; 1152). There is nothing behind, no pose, no scenic effect. It may be said of his letters that in them "tota patet vita senis." His nature was flexible without being faultily weak. He has many moods and each mood imprints itself in turn on his words. Hence, on a superficial view, Erasmus is set down as the most inconsistent of men. Further acquaintance makes us feel a unity of character underlying this susceptibility to the impressions of the moment. His seeming inconsistencies are reconciled to apprehension, not by a formula of the intellect, but by the many-sidedness of a highly impressible nature. In the words of J. Nisard, Erasmus was one of those "dont la gloire a été de beaucoup comprendre et d'affirmer peu."

This equal openness to every vibration of his environment is the key to all Erasmus's acts and words, and among them to the middle attitude which he took up towards the great religious conflict of his time. The reproaches of party assailed him in his lifetime, and have continued to be heaped upon his memory. He was loudly accused by the Catholics of collusion with the enemies of the faith. His powerful friends, the pope, Wolsey, Henry VIII., the emperor, called upon him to declare against Luther. Theological historians from that time forward have perpetuated the indictment that Erasmus sided with neither party in the struggle for religious truth. The most moderate form of the censure presents him in the odious light of a trimmer; the vulgar and venomous assailant is sure that Erasmus was a Protestant at heart, but withheld the avowal that he might not forfeit the worldly advantages he enjoyed as a Catholic. When by study of his writings we come to know Erasmus intimately, there is revealed to us one of those natures to which partisanship is an impossibility. It was not timidity or weakness which kept Erasmus neutral, but the reasonableness of his nature. It was not only that his intellect revolted against the narrowness of party, his whole being repudiated its clamorous and vulgar excesses. As he loathed fish, so he loathed clerical fanaticism. Himself a Catholic priest—"the glory of the priesthood and the shame"—the tone of the orthodox clergy was distasteful to him; the ignorant hostility to classical learning which reigned in their colleges and convents disgusted him. In common with all the learned men of his age, he wished to see the power of the clergy broken, as that of an obscurantist army arrayed against light. He had employed all his resources of wit and satire against the priests and monks, and the superstitions in which they traded, long before Luther's name was heard of. The motto which was already current in his lifetime, "that Erasmus laid the egg and Luther hatched it," is so far true, and no more. Erasmus would have suppressed the monasteries, put an end to the domination of the clergy, and swept away scandalous and profitable abuses, but to attack the church or re-mould received theology was far from his thoughts. And when out of Luther's revolt there arose a new fanaticism—that of evangelism, Erasmus recoiled from the violence of the new preachers. "Is it for this," he writes to Melanchthon (*Ep.* xix. 113; 703), "that we have shaken off bishops and popes, that we may come under the yoke of such madmen as Otto and Farel?" Passages have been collected, and it is an easy task, from the writings of Erasmus to prove that he shared the doctrines of the Reformers. Passages equally strong might be culled to show that he repudiated them. The truth is that theological questions in themselves had no attraction for him. And when a theological position was emphasized by party passion it became odious to him. In the words of Drummond: "Erasmus was in his own age the apostle of common sense and of rational religion. He did not care for dogma, and accordingly the dogmas of Rome, which had the consent of the Christian world, were in his eyes preferable to the dogmas of Protestantism.... From the beginning to the end of his career he remained true to the purpose of his life, which was to fight the battle of sound learning

and plain common sense against the powers of ignorance and superstition, and amid all the convulsions of that period he never once lost his mental balance."

Erasmus is accused of indifference. But he was far from indifferent to the progress of the revolution. He was keenly alive to its pernicious influence on the cherished interest of his life, the cause of learning. "I abhor the evangelics, because it is through them that literature is everywhere declining, and upon the point of perishing." He had been born with the hopes of the Renaissance, with its anticipation of a new Augustan age, and had seen this fair promise blighted by the irruption of a new horde of theological polemics, worse than the old scholastics, inasmuch as they were revolutionary instead of conservative. Erasmus never flouted at religion nor even at theology as such, but only at blind and intemperate theologians.

In the mind of Erasmus there was no metaphysical inclination; he was a man of letters, with a general tendency to rational views on every subject which came under his pen. His was not the mind to originate, like Calvin, a new scheme of Christian thought. He is at his weakest in defending free will against Luther, and indeed he can hardly be said to enter on the metaphysical question. He treats the dispute entirely from the outside. It is impossible in reading Erasmus not to be reminded of the rationalist of the 18th century. Erasmus has been called the "Voltaire of the Renaissance." But there is a vast difference in the relations in which they respectively stood to the church and to Christianity. Voltaire, though he did not originate, yet adopted a moral and religious scheme which he sought to substitute for the church tradition. He waged war, not only against the clergy, but against the church and its sovereigns. Erasmus drew the line at the first of these. He was not an anticipation of the 18th century; he was the man of his age, as Voltaire of his; though Erasmus did not intend it, he undoubtedly shook the ecclesiastical edifice in all its parts; and, as Melchior Adam says of him, "pontifici Romano plus nocuit jocando quam Lutherus stomachando."

But if Erasmus was unlike the 18th century rationalist in that he did not declare war against the church, but remained a Catholic and mourned the disruption, he was yet a true rationalist in principle. The principle that reason is the one only guide of life, the supreme arbiter of all questions, politics and religion included, has its earliest and most complete exemplar in Erasmus. He does not dogmatically denounce the rights of reason, but he practically exercises them. Along with the charm of style, the great attraction of the writings of Erasmus is this unconscious freedom by which they are pervaded.

It must excite our surprise that one who used his pen so freely should have escaped the pains and penalties which invariably overtook minor offenders in the same kind. For it was not only against the clergy and the monks that he kept up a ceaseless stream of satiric raillery; he treated nobles, princes and kings with equal freedom. No 18th century republican has used stronger language than has this pensioner of Charles V. "The people build cities, princes pull them down; the industry of the citizens creates wealth for rapacious lords to plunder; plebeian magistrates pass good laws for kings to violate; the people love peace, and their rulers stir up war." Such outbursts are frequent in the *Adagia*. These freedoms are part cause of Erasmus's popularity. He was here in sympathy with the secret sore of his age, and gave utterance to what all felt but none dared to whisper but he. It marks the difference between 1513 and 1669 that, in a reprint of the *Julius Exclusus* published in 1669 at Oxford, it was thought necessary to leave out a sentence in which the writer of that dialogue, supposed by the editor to be Erasmus, asserts the right of states to deprive and punish bad kings. It is difficult to say to what we are to ascribe his immunity from painful consequences. We have to remember that he was removed from the scene early in the reaction, before force was fully organized for the suppression of the revolution. And his popular works, the *Adagia*, and the *Colloquia* (1524), had established themselves as standard books in the more easy going age, when power, secure in its unchallenged strength, could afford to laugh with the laughers at itself. At the date of his death the Catholic revival, with its fell antipathy to art and letters, was only in its infancy; and when times became dangerous, Erasmus cautiously declined to venture out of the protection of the Empire, refusing repeated invitations to Italy and to France. "I had thought of going to Besançon," he said, "ne non essem in ditione Caesaris" (*Ep.* xxx. 74; 1299). In Italy a Bembo and a Sadoleto wrote a purer Latin than Erasmus, but contented themselves with pretty phrases, and were careful to touch no living chord of feeling. In France it was necessary for a Rabelais to hide his free-thinking under a disguise of revolting and unintelligible jargon. It was only in the Empire that such liberty of speech as Erasmus used was practicable, and in the Empire Erasmus passed for a moderate man. Upon the strength of an established character for moderation he enjoyed an exceptional licence for the utterance of unwelcome truths; and in spite of his flings at the rich and powerful, he remained through life a privileged person with them.

But though the men of the keys and the sword let him go his way unmolested, it was otherwise with his brethren of the pen. A man who is always launching opinions must expect to be retorted on. And when these judgments were winged by epigram, and weighted by the name of Erasmus, who stood at the head of letters, a widespread exasperation was the consequence. Disraeli has not noticed Erasmus in his *Quarrels of Authors*, perhaps because Erasmus's quarrels would require a volume to themselves. "So thin-skinned that a fly would draw blood," as the prince of Carpi expressed it, he could not himself restrain his pen from sarcasm. He forgot that though it is safe to lash the dunces, he could not with equal impunity sneer at those who, though they might not have the ear of the public as he had, could yet contradict and call names. And when literary jealousy was complicated with theological differences, as in the case of the free-thinkers, or with French vanity, as in that of

Budaeus, the cause of the enemy was espoused by a party and a nation. The quarrel with Budaeus was strictly a national one. Cosmopolitan as Erasmus was, to the French literati he was still the Teuton. Étienne Dolet calls him “enemy of Cicero, and jealous detractor of the French name.” The only contemporary name which could approach to a rivalry with his was that of Budaeus (Budé), who was exactly contemporary, having been born in the same year as Erasmus. Rivals in fame, they were unlike in accomplishment, each having the quality which the other wanted. Budaeus, though a Frenchman, knew Greek well; Erasmus, though a Dutchman, very imperfectly. But the Frenchman Budaeus wrote an execrable Latin style, unreadable then as now, while the Teuton Erasmus charmed the reading world with a style which, though far from good Latin, is the most delightful which the Renaissance has left us.

The style of Erasmus is, considered as Latin, incorrect, sometimes even barbarous, and far removed from any classical model. But it has qualities far above purity. The best Italian Latin is but an echo and an imitation; like the painted glass which we put in our churches, it is an anachronism. Bembo, Sadoleto and the rest write purely in a dead language. Erasmus’s Latin was a living and spoken tongue. Though Erasmus had passed nearly all his life in England, France and Germany, his conversation was Latin; and the language in which he talked about common things he wrote. Hence the spontaneity and naturalness of his page, its flavour of life and not of books. He writes from himself, and not out of Cicero. Hence, too, he spoiled nothing by anxious revision in terror lest some phrase not of the golden age should escape from his pen. He confesses apologetically to Christopher Longolius (*Ep.* iii. 63; 402) that it was his habit to extemporize all he wrote, and that this habit was incorrigible; “effundo verius quam scribo omnia.” He complains that much reading of the works of St Jerome had spoiled his Latin; but, as Scaliger says (*Scalig*[a] 2[a]), “Erasmus’s language is better than St Jerome’s.” The same critic, however, thought Erasmus would have done better “if he had kept more closely to the classical models.”

In the annals of classical learning Erasmus may be regarded as constituting an intermediate stage between the humanists of the Latin Renaissance and the learned men of the age of Greek scholarship, between Angelo Poliziano and Joseph Scaliger. Erasmus, though justly styled by Muretus (*Varr. Lectt.* 7, 15) “eruditus sane vir, ac multae lectionis,” was not a “learned” man in the special sense of the word—not an “érudit.” He was more than this; he was the “man of letters”—the first who had appeared in Europe since the fall of the Roman empire. His acquirements were vast, and they were all brought to bear upon the life of his day. He did not make a study apart of antiquity for its own sake, but used it as an instrument of culture. He did not worship, imitate and reproduce the classics, like the Latin humanists who preceded him; he did not master them and reduce them to a special science, as did the French Hellenists who succeeded him. He edited many authors, it is true, but he had neither the means of forming a text, nor did he attempt to do so. In editing a father, or a classic, he had in view the practical utility of the general reader, not the accuracy required by the gild of scholars. “His Jerome,” says J. Scaliger, “is full of sad blunders” (*Scalig*[a] 2[a]). Even Julien Garnier could discover that Erasmus “falls in his haste into grievous error in his Latin version of St Basil, though his Latinity is superior to that of the other translators” (Pref. in *Opp. St. Bas.*, 1721). It must be remembered that the commercial interests of Froben’s press led to the introduction of Erasmus’s name on many a title page when he had little to do with the book, *e.g.* the Latin *Josephus* of 1524 to which Erasmus only contributed one translation of 14 pages; or the *Aristotle* of 1531, of which Simon Grynaeus was the real editor. Where Erasmus excelled was in prefaces—not philological introductions to each author, but spirited appeals to the interest of the general reader, showing how an ancient book might be made to minister to modern spiritual demands.

Of Erasmus’s works the Greek Testament is the most memorable. It has no title to be considered as a work of learning or scholarship, yet its influence upon opinion was profound and durable. It contributed more to the liberation of the human mind from the thraldom of the clergy than all the uproar and rage of Luther’s many pamphlets. As an edition of the Greek Testament it has no critical value. But it was the first, and it revealed the fact that the Vulgate, the Bible of the church, was not only a second-hand document, but in places an erroneous document. A shock was thus given to the credit of the clergy in the province of literature, equal to that which was given in the province of science by the astronomical discoveries of the 17th century. Even if Erasmus had had at his disposal the MSS. subsidia for forming a text, he had not the critical skill required to use them. He had at hand a few late Basel MSS., one of which he sent straight to press, correcting them in places by collations of others which had been sent to him by Colet in England. In four reprints, 1519, 1522, 1527, 1535, Erasmus gradually weeded out many of the typographical errors of his first edition, but the text remained essentially such as he had first printed it. The Greek text indeed was only a part of his scheme. An important feature of the volume was the new Latin version, the original being placed alongside as a guarantee of the translator’s good faith. This translation, with the justificatory notes which accompanied it, though not itself a work of critical scholarship, became the starting-point of modern exegetical science. Erasmus did nothing to solve the problem, but to him belongs the honour of having first propounded it.

Besides translating and editing the New Testament, Erasmus paraphrased the whole, except the Apocalypse, between 1517 and 1524. The paraphrases were received with great applause, even by those who had little appreciation for Erasmus. In England a translation of them made in 1548 was ordered to be placed in all parish churches beside the Bible. His correspondence is perhaps the part of his works which has the most permanent value; it comprises about 3000 letters, which form an

important source for the history of that period. For the same purpose his *Colloquia* may be consulted. They are a series of dialogues, written first for pupils in the early Paris days as formulae of polite address, but afterwards expanded into lively conversations, in which many of the topics of the day are discussed. Later in the century they were read in schools, and some of Shakespeare's lines are direct reminiscences of Erasmus.

His complete works have been printed twice; by the Froben firm under the direction of his literary executors (9 vols., Basel, 1540); and by Leclerc at Leiden (11 vols., 1703-1706). For his life the chief contemporary sources are a *Compendium vitae* written by himself in 1524, and a sketch prefixed by Beatus Rhenanus to the Basel edition of 1540. Of his writings he gives an account in his *Catalogus lucubrationum*, composed first in January 1523 and enlarged in September 1524; and also in a letter to Hector Boece of Aberdeen, written in 1530. An elaborate bibliography, entitled *Bibliotheca Erasmiana*, was undertaken by the officials of the Ghent University Library; it is divided into three sections, for Erasmus's writings, the books he edited, and the literature about him. *Listes sommaires* were issued in 1893; and since 1897 the completed volumes have been appearing at intervals. There is an excellent sketch of Erasmus's life down to 1519 in F. Seebohm's *Oxford Reformers* (3rd ed., 1887); and of the many biographies those by S. Knight (1726), J. Jortin (2 vols., 1758-1760) and R.B. Drummond (2 vols., 1873) may be mentioned. There are also two volumes (1901-1904) of translations by F.M. Nichols from Erasmus's letters down to 1517, with an ample commentary which amounts almost to a biography; and an edition of the letters, in Latin, was begun by the Oxford University Press in 1906 (vol. ii., 1910).

(M. P.; P. S. A.)

ERASTUS, THOMAS (1524-1583), German-Swiss theologian, whose surname was Lüber, Lieber, or Liebler, was born of poor parents on the 7th of September 1524, probably at Baden, canton of Aargau, Switzerland. In 1540 he was studying theology at Basel. The plague of 1544 drove him to Bologna and thence to Padua as student of philosophy and medicine. In 1553 he became physician to the count of Henneberg, Saxe-Meiningen, and in 1558 held the same post with the elector-palatine, Otto Heinrich, being at the same time professor of medicine at Heidelberg. His patron's successor, Frederick III., made him (1559) a privy councillor and member of the church consistory. In theology he followed Zwingli, and at the sacramentarian conferences of Heidelberg (1560) and Maulbronn (1564) he advocated by voice and pen the Zwinglian doctrine of the Lord's Supper, replying (1565) to the counter arguments of the Lutheran Johann Marbach, of Strassburg. He ineffectually resisted the efforts of the Calvinists, led by Caspar Olevianus, to introduce the Presbyterian polity and discipline, which were established at Heidelberg in 1570, on the Genevan model. One of the first acts of the new church system was to excommunicate Erastus on a charge of Socinianism, founded on his correspondence with Transylvania. The ban was not removed till 1575, Erastus declaring his firm adhesion to the doctrine of the Trinity. His position, however, was uncomfortable, and in 1580 he returned to Basel, where in 1583 he was made professor of ethics. He died on the 31st of December 1583. He published several pieces bearing on medicine, astrology and alchemy, and attacking the system of Paracelsus. His name is permanently associated with a posthumous publication, written in 1568. Its immediate occasion was the disputation at Heidelberg (1568) for the doctorate of theology by George Wither or Withers, an English Puritan (subsequently archdeacon of Colchester), silenced (1565) at Bury St Edmunds by Archbishop Parker. Withers had proposed a disputation against 733
vestments, which the university would not allow; his thesis affirming the excommunicating power of the presbytery was sustained. Hence the treatise of Erastus. It was published (1589) by Giacomo Castelvetri, who had married his widow, with the title *Explicatio gravissimae quaestionis utrum excommunicatio, quatenus religionem intelligentes et amplexantes, a sacramentorum usu, propter admissum facinus arcet, mandato nitatur divino, an excogitata sit ab hominibus*. The work bears the imprint Pesclavii (*i.e.* Poschiavo in the Grisons) but was printed by John Wolfe in London, where Castelvetri was staying; the name of the alleged printer is an anagram of Jacobum Castelvetrum. In the Stationers' Register (June 20, 1589) the printing is said to have been "alowed" by Archbishop Whitgift. It consists of seventy-five *Theses*, followed by a *Confirmatio* in six books, and an appendix of letters to Erastus by Bullinger and Gualther, showing that his *Theses*, written in 1568, had been circulated in manuscript. An English translation of the *Theses*, with brief life of Erastus (based on Melchior Adam's account), was issued in 1659, entitled *The Nullity of Church Censures*; it was reprinted as *A Treatise of Excommunication* (1682), and, as revised by Robert Lee, D.D., in 1844. The aim of the work is to show, on Scriptural grounds, that sins of professing Christians are to be punished by civil authority, and not by withholding of sacraments on the part of the clergy. In the Westminster Assembly a party holding this view included Selden, Lightfoot, Coleman and Whitelocke, whose speech (1645) is appended to Lee's version of the *Theses*; but the opposite view, after much controversy, was carried, Lightfoot alone dissenting. The consequent chapter of the Westminster Confession ("Of Church Censures") was, however, not ratified by the English parliament. "Erastianism," as a by-word, is used to denote the doctrine of the supremacy of the state in ecclesiastical causes; but the problem of the relations between church and state is one on which Erastus nowhere enters. What is known as "Erastianism" would be better connected with the name of Grotius. The only direct reply made to the *Explicatio* was the *Tractatus de vera excommunicatione*

(1590) by Theodore Beza, who found himself rather savagely attacked in the *Confirmatio thesium*; *e.g.* “Apostolum et Mosen adeoque Deum ipsum audes corrigere.”

See A. Bonnard, *Thomas Éraste et la discipline ecclésiastique* (1894); Gass, in *Allgemeine deutsche Biog.* (1877); G.V. Lechler and R. Stähelin, in A. Hauck’s *Realencyklop. für prot. Theol. u. Kirche* (1898).

(A. Go.*)

ERATOSTHENES OF ALEXANDRIA (*c.* 276-*c.* 194 B.C.), Greek scientific writer, was born at Cyrene. He studied grammar under Callimachus at Alexandria, and philosophy under the Stoic Ariston and the Academic Arcesilaus at Athens. He returned to Alexandria at the summons of Ptolemy III. Euergetes, by whom he was appointed chief librarian in place of Callimachus. He is said to have died of voluntary starvation, being threatened with total blindness. Eratosthenes was one of the most learned men of antiquity, and wrote on a great number of subjects. He was the first to call himself Philologos (in the sense of the “friend of learning”), and the name Pentathlos was bestowed upon him in honour of his varied accomplishments. He was also called *Beta* as being second in all branches of learning, though not actually first in any. In mathematics he wrote two books *On means* (Περὶ μεσοτήτων) which are lost, but appear, from a remark of Pappus, to have dealt with “loci with reference to means.” He devised a mechanical construction for two mean proportionals, reproduced by Pappus and Eutocius (Comm. on Archimedes). His κόσκινον or *sieve* (*cribrum Eratosthenis*) was a device for discovering all prime numbers. He laid the foundation of mathematical geography in his *Geographica*, in three books. His greatest achievement was his measurement of the earth. Being informed that at Syene (Assuan), on the day of the summer solstice at noon, a well was lit up through all its depth, so that Syene lay on the tropic, he measured, at the same hour, the zenith distance of the sun at Alexandria. He thus found the distance between Syene and Alexandria (known to be 5000 stadia) to correspond to $\frac{1}{50}$th of a great circle, and so arrived at 250,000 stadia (which he seems subsequently to have corrected to 252,000) as the circumference of the earth. He is credited by Ptolemy and his commentator Theon with having found the distance between the tropics to be $11\frac{11}{83}$ rds. of the meridian circle, which gives 23° 51′ 20″ for the obliquity of the ecliptic. His astronomical poem *Hermes* began apparently with the birth and exploits of Hermes, then passed to the legend of his having ordered the heavens, the zones and the stars, and gave a history of the latter. His *Erigone*, of which a few fragments are also preserved, is sometimes spoken of as a separate poem, but it may have belonged to the *Hermes*, which appears also to have been known by other names such as *Catalogi*. The still extant *Catasterismi*, containing the story of certain stars in prose, is probably not by Eratosthenes.

Eratosthenes was the founder of scientific chronology in his χρονογραφία in which he endeavoured to fix the dates of the chief literary and political events from the conquest of Troy. An important work was his treatise on the old comedy, dealing with theatres and theatrical apparatus generally, and discussing the works of the principal comic poets themselves. Works on moral philosophy, history, and a number of letters were also attributed to him.

There is a complete edition of the fragments of Eratosthenes by Bernhardy (1822); poetical fragments, Hillier (1872); geographical, Seidel (1799) and Berger (1880); καταστερισμοι, Schaubach (1795) and Robert (1878). See Sandys, *Hist. Class. Schol.* i. (1906).

(T. L. H.)

ERBACH, a town of Germany, in the grand-duchy of Hesse-Darmstadt, on the Mümling, 22 m. S.E. of Darmstadt. It has cloth mills and ivory-turning, for which last branch it possesses a technical school. Wool and cattle fairs are held twice a year. Pop. 2800. The castle contains an interesting collection of weapons and pictures, and in the chapel are the coffins of Einhard, the friend and biographer of Charlemagne, and his wife, Emma.

Erbach has long been the residence of the counts of Erbach, who trace their descent back to the 12th century, and who held the office of cupbearer to the electors palatine of the Rhine until 1806. In 1532 the emperor Charles V. made the county a direct fief of the Empire, on account of the services rendered by Count Eberhard during the Peasants’ War. Since 1717 the family has been divided into the three lines of Erbach-Fürstenau, Erbach-Erbach and Erbach-Schönberg, who rank for precedence, not according to the age of their descent, but according to the age of the chief of their line. In 1818 the counts of Erbach-Erbach inherited the county of Wartenberg-Roth, and in 1903 the count of Erbach-Schönberg was granted the title of prince. The county was mediatized in 1806, and is now incorporated with the duchy of Hesse-Darmstadt.

See Simon, *Die Geschichte der Dynasten und Grafen zu Erbach* (Frankfort, 1858).

ERBIUM (symbol, Er; atomic weight, 165-166), one of the metals of the rare earths. The first of the rare earth minerals was discovered in 1794 by J. Gadolin and was named gadolinite from its discoverer. In 1797 Ekeberg showed that gadolinite contained another rare earth, which was given the name yttria. Yttria is an exceedingly complex mixture, which has been decomposed, yielding as an intermediate product terbia. This latter substance in its turn has been split by J.L. Soret, P.T. Cleve, Lecoq de Boisbaudran and others into erbia, holmia, thulia and dysprosia, but it is still doubtful whether any one of these four splitting products is a single substance. The rare earth metals are found in the minerals gadolinite, samarskite, fergusonite, euxenite and cerite. They are separated from the minerals by converting them into oxalates, which by ignition give the corresponding oxides. The oxides are then converted into double sulphates which are separated from each other by repeated fractional crystallization or by fractional precipitation with ammonia or some other base. Erbium forms rose-coloured salts and a rose-coloured oxide. The oxide dissolves slowly in acids; it is not reduced by hydrogen and is infusible. The salts show a characteristic absorption spectrum.

See J.F. Bahr and R. Bunsen (*Ann.*, 1866, 137, p. 1); A. v. Welsbach (*Monats.*, 1883, 4, p. 641; 1884, 5, p. 508; 1885, 6, p. 477); P.T. Cleve (*Comptes rendus*, 1879, 89, p. 478; 1880, 91, pp. 328, 381; 1882, 95, p. 1225; *Bull. de la soc. chim.*, 1874, 21, p. 196; 1883, 39, p. 287); C. Marignac (*Ann. Chim. phys.*, 1849 [3] 27, p. 226); B. Brauner (*Monats.*, 1882, 3, p. 13); W. Crookes (*Proc. Roy. Soc.*, 1886, 40, p. 502); Lecoq de Boisbaudran (*Comptes rendus*, 1886, 102, p. 1005); A. Bettendorf (*Ann.*, 1892, 270, p. 376); M. Muthmann (*Ber.*, 1898, 31, p. 1718; 1900, 33, p. 42); G. Krüss (*Zeit. f. anorg. Chem.*, 1893, 3, p. 108).

ERCILLA Y ZÚNIGA, ALONSO DE (1533-1595), Spanish soldier and poet, was born in Madrid on the 7th of August 1533. In 1548 he was appointed page to the heir-apparent, afterwards Philip II. In this capacity Ercilla visited Italy, Germany and the Netherlands, and was present in 1554 at the marriage of his master to Mary of England. Hearing that an expedition was preparing to subdue the Araucanians of Chile, he joined the adventurers. He distinguished himself in the ensuing campaign; but, having quarrelled with a comrade, he was condemned to death in 1558 by his general, Garcia Hurtado de Mendoza. The sentence was commuted to imprisonment, but Ercilla was speedily released and fought at the battle of Quipeo (14th of December 1558). He returned to Spain in 1562, visited Italy, France, Germany, Bohemia, and in 1570 married Maria de Bazán, a lady distantly connected with the Santa Cruz family; in 1571 he was made knight of the order of Santiago, and in 1578 he was employed by Philip II. on a mission to Saragossa. He complained of living in poverty but left a modest fortune, and was obviously disappointed at not being offered the post of secretary of state. His principal work is *La Araucana*, a poem based on the events of the wars in which he had been engaged. It consists of three parts, of which the first, composed in Chile and published in 1569, is a versified narrative adhering strictly to historic fact; the second, published in 1578, is encumbered with visions and other romantic machinery; and the third, which appeared in 1589-1590, contains, in addition to the subject proper, a variety of episodes mostly irrelevant. This so-called epic lacks symmetry, and has been over-praised by Cervantes and Voltaire; but it is written in excellent Spanish, and is full of vivid rhetorical passages. An analysis of the poem was given by Hayley in his *Essay on Epic Poetry* (1782).

A good biography precedes the *Morceaux choisis* (Paris, 1900) by Jean Ducamin.

ERCKMANN-CHATRIAN, the joint names of two French writers whose collaboration made their work that of, so to speak, one personality. Émile Erckmann (1822-1899) was born on the 20th of May 1822 at Phalsbourg, and Louis Gratien Charles Alexandre Chatrian (1826-1890) on the 18th of December 1826 at Soldatenthal, Lorraine. In 1847 they began to write together, and continued doing so till 1889. Chatrian died in 1890 at Villemomble near Paris, and Erckmann at Lunéville in 1899. The list of their publications is a long one, ranging from the *Histoires et contes fantastiques* (1849; reprinted from the *Démocrate du Rhin*), *L'Illustre Docteur Mathéus* (1859), *Madame Thérèse* (1863), *L'Ami Fritz* (1864), *Histoire d'un conscrit de 1813* (1864), *Waterloo* (1865), *Le Blocus* (1867), *Histoire d'un paysan* (4 vols., 1868-1870), *L'Histoire du plébiscite* (1872), to *Le Grand-père Lebigue* (1880); besides dramas like *Le Juif polonais* (1869) and *Les Rantzau* (1882). Without any special literary claim, their stories are distinguished by simplicity and genuine descriptive power, particularly in the battle scenes and in connexion with Alsatian peasant life. They are marked by a genuine democratic

spirit, and by real patriotism, which developed after 1870 into hatred of the Germans. The authors attacked militarism by depicting the horrors of war in the plainest terms.

See also J. Claretie, *Erckmann-Chatrian* (1883), in the series of "Célébrités contemporaines."

ERDÉLYI, JÁNOS (1814-1868), Hungarian poet and author, was born in 1814 at Kapos, in the county of Ungvár, and educated at the Protestant college of Sárospatak. In 1833 he removed to Pest, where he was, in 1839, elected member of the Hungarian Academy of Sciences. His literary fame was made by his collection of Hungarian national poems and folk-tales, *Magyar Népköltési Gyüjtemény, Népdalok és Mondák* (Pest, 1846-1847). This work, published by the Kisfaludy Society, was supplemented by a dissertation upon Hungarian national poetry, afterwards partially translated into German by Stier (Berlin, 1851). Erdélyi also compiled for the Kisfaludy Society an extensive collection of Hungarian proverbs—*Magyar Közmondások könyve* (Pest, 1851),—and was for some time editor of the *Szépirodalmi Szemle* (*Review of Polite Literature*). In 1848 he was appointed director of the national theatre at Pest; but after 1849 he resided at his native town. He died on the 23rd of January 1868. A collection of folklore was published the year after his death, entitled *A Nép Koltészete népdalok, népmesék és közmondások* (Pest, 1869). This work contains 300 national songs, 19 folk-tales and 7362 Hungarian proverbs.

ERDMANN, JOHANN EDUARD (1805-1892), German philosophical writer, was born at Wolmar in Livonia on the 13th of June 1805. He studied theology at Dorpat and afterwards at Berlin, where he fell under the influence of Hegel. From 1829 to 1832 he was a minister of religion in his native town. Afterwards he devoted himself to philosophy, and qualified in that subject at Berlin in 1834. In 1836 he was professor-extraordinary at Halle, became full professor in 1839, and died there on the 12th of June 1892. He published many philosophical text-books and treatises, and a number of sermons; but his chief claim to remembrance rests on his elaborate *Grundriss der Geschichte der Philosophie* (2 vols., 1866), the 3rd edition of which has been translated into English. Erdmann's special merit is that he does not rest content with being a mere summarizer of opinions, but tries to exhibit the history of human thought as a continuous and ever-developing effort to solve the great speculative problems with which man has been confronted in all ages. His chief other works were: *Leib und Seele* (1837), *Grundriss der Psychologie* (1840), *Grundriss der Logik und Metaphysik* (1841), and *Psychologische Briefe* (1851).

ERDMANN, OTTO LINNÉ (1804-1869), German chemist, son of Karl Gottfried Erdmann (1774-1835), the physician who introduced vaccination into Saxony, was born at Dresden on the 11th of April 1804. In 1820 he began to attend the medico-chirurgical academy of his native place, and in 1822 he entered the university of Leipzig where in 1827 he became extraordinary professor, and in 1830 ordinary professor of chemistry. This office he held until his death, which happened at Leipzig on the 9th of October 1869. He was particularly successful as a teacher, and the laboratory established at Leipzig under his direction in 1843 was long regarded as a model institution. As an investigator he is best known for his work on nickel and indigo and other dye-stuffs. With R.F. Marchand (1813-1850) he also carried out a number of determinations of atomic weights. In 1828, in conjunction with A.F.G. Werther (1815-1869), he founded the *Journal für technische und ökonomische Chemie*, which became in 1834 the *Journal für praktische Chemie*. He was also the author of *Über das Nickel* (1827), *Lehrbuch der Chemie* (1828), *Grundriss der Waarenkunde* (1833), and *Über das Studium der Chemie* (1861).

EREBUS, in Greek mythology, son (according to Hesiod, *Theog.* 123) of Chaos, and father of Aether (upper air) and Hemera (day) by his sister Nyx (night). The word, which signifies darkness, is in Homer the gloomy subterranean region through which the departed shades pass into Hades. The entrance to it was in the extreme west, on the borders of Ocean, in the mythical land of the

Cimmerians. It is to be distinguished from Tartarus, the place of punishment for the wicked.

ERECH (*Uruk* in the Babylonian inscriptions; Gr. *Orchoë*), the Biblical name of an ancient city of Babylonia, situated E. of the present bed of the Euphrates, on the line of the ancient Nil canal, in a region of marshes, about 140 m. S.S.E. from Bagdad. It was one of the oldest and most important cities of Babylonia, and the site of a famous temple, called E-Anna, dedicated to the worship of Nana, or Ishtar. Erech played a very important part in the political history of the country from an early time, exercising hegemony in Babylonia at a period before the time of Sargon. Later it was prominent in the national struggles of the Babylonians against Elam (2000 B.C. and earlier), in which it suffered severely; recollections of these conflicts are embodied in the Gilgamesh epic, as it has come down to us through the library of Assur-bani-pal. Erech enjoyed much distinction in the later times, as a seat 735 of learning and of the worship of Ishtar, and Assur-bani-pal drew largely on its literary stores for his library at Nineveh, from which we derive our principal information concerning ancient Babylonian literature. The inscriptions found here show that it continued in existence through the Persian and Seleucid periods. The ruins of the ancient site, known as Warka, which are among the largest in all Babylonia, forming an irregular circle nearly 6 m. in circumference, bounded by a wall, still standing in some places to the height of 40 ft., were explored and partially excavated by W.K. Loftus in 1850 and 1854. The most conspicuous ruin, now called Abu-Berdi, “Father of Marsh Grass,” or Buwariye, “reed matting,” because of the layers of reeds between each twelve courses of unbaked brick, is the *ziggurat* (tower) of the ancient temple of E-Anna. It is about 100 ft. in height, and strikingly resembles in general appearance the ruins of the ziggurat of the temple of Enlil at Nippur. Second to this in size was the ruin called Wuswas, a walled quadrangle, including an area of more than seven and a half acres, within which was an edifice 246 ft. long and 174 ft. wide, elevated on an artificial platform 50 ft. in height. The south-west façade, still standing in some places to the height of 23 ft., exhibited an interesting use of half columns, and stepped recesses for purposes of decoration. In another ruin Loftus found a wall, 30 ft. long, composed entirely of small yellow terra-cotta nail-headed cones, such as have been discovered in great numbers, inscribed and uninscribed, used for votive purposes in connexion with walls at Tello and elsewhere in Babylonia. His excavations being superficial, the Babylonian inscriptions found by him, about one hundred in all, exclusive of the ancient Ur-Gur bricks from the temple, belong in general to the neo-Babylonian, Persian and Seleucid periods. The older remains are buried deep beneath the huge mass of later debris. Loftus also discovered at Erech, almost everywhere within and without the walls, great numbers of clay coffins, piled one above another, to the height of over 30 ft., forming a vast and, on the whole, well-ordered cemetery belonging to the Persian, Parthian and later occupations of Babylonia, during which period Erech, like other cities of the south, evidently became a necropolis for a large extent of country. After Loftus’s time the mounds were visited by various travellers, but no further excavations have been conducted. Work on this important part of the site is attended with very great difficulties, owing to the inaccessible position of the ruins, the unsettled character of the country, the frequent sand-storms, and above all, the immense mass of material of later periods which must be removed before a systematic excavation of the more ancient and interesting ruins could be undertaken. A curious feature of the Warka neighbourhood is the existence of conical sand-hills, rising to a considerable height, so compact as to be almost like stone. These hills extend from Warka northward as far as Tel Ede.

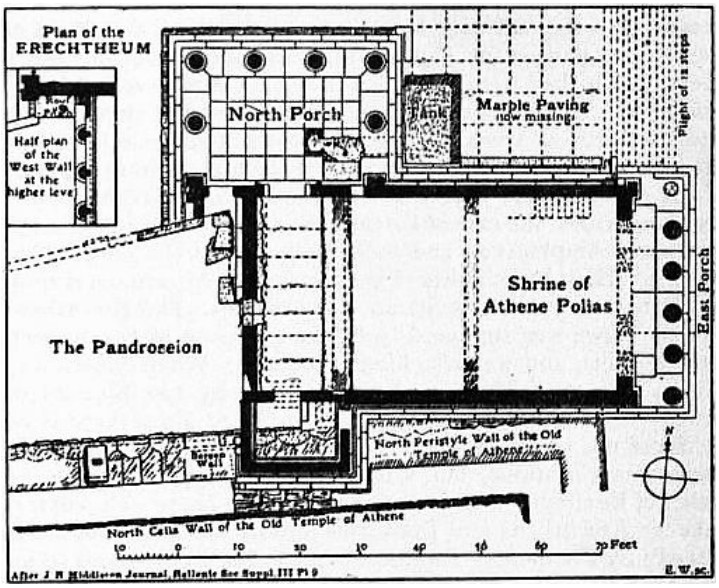
See W.K. Loftus, *Chaldaea and Susiana* (1857); J.P. Peters, *Nippur* (1897); E. Sachau, *Am Euphrat und Tigris* (1900). Cf. also Nippur and authorities there quoted.

(J. P. Pe.)

ERECHTHEUM, a temple (commonly called after Erechtheus, to whom a portion of it was dedicated) on the acropolis at Athens, unique in plan, and in its execution the most refined example of the Ionic order. There is no clear evidence as to when the building was begun, some placing it among the temples projected by Pericles, others assigning it to the time after the peace of Nicias in 421 B.C. The work was interrupted by the stress of the Peloponnesian War, but in 409 B.C. a commission was appointed to make a report on the state of the building and to undertake its completion, which was carried out in the following year.

The peculiar plan of the Erechtheum has given rise to much speculation. It may be due partly to the natural conformation of the rock and the differences of level, partly to the necessity of enclosing within a single building several objects of ancient sanctity, such as the mark of Poseidon’s trident and the spring that arose from it, the sacred olive tree of Athena, and the tomb of Cecrops. But there are some features which cannot be so explained, and which have led Professor W. Dörpfeld and others to believe that the plan, as we now have it, is a modification or abridgment of the original design, due to

the same conservative influences as led to the curtailment of the plan of the Propylaea (*q.v.*).



The building as completed consisted of a temple of the ordinary type, opening by a door and two windows to the east front, before which stood a portico of six Ionic columns. This part was the temple of Athena Polias. Adjoining it on the west was the central chamber, on a lower level; this chamber was separated by a partition, originally of wood and later of marble, from the western compartment of the temple, which was of peculiar construction. The west end was formed by a wall, on which stood four columns between antae; but the main entrance to this western compartment was through a large and very ornate doorway on the north; and a large Ionic portico, consisting of four columns in the front, and one in the return on each side, was placed in front of this door. At the south end of the western compartment was a smaller door, with steps leading up to the higher level, within a projecting space enclosed by a low wall and covered with a projecting porch carried by six “maidens” or caryatides. The construction of the building at this south-western corner shows that there was some sacred object that had to be bridged over by a huge block of marble; this we know from inscriptions to have been the Cecropeum or tomb of Cecrops. In the north portico a square hole in the floor, with a corresponding hole in the roof above it, must have given access to another sacred object, the mark of Poseidon’s trident in the rock. The sacred olive tree probably stood just outside the temple to the west in the Pandroseion. The Ionic order, as used in this temple, is of the most ornate Attic type. The bases of the columns are either reeded or decorated with a plait-pattern; the capital has the broad channel between the volutes subdivided by a carefully-profiled incision; and the top of the shafts is ornamented by a broad band of palmette or honeysuckle pattern. A similar band of ornament runs round the top of the walls outside, and at their base is a reeded torus. The frieze consisted of white marble figures in relief, affixed to a background of black Eleusinian stone.

The contents of the Erechtheum are described by Pausanias. It contained the ancient image of Athena Polias, and three altars, one to Poseidon and Erechtheus, one to Butes and one to Hephaestus; there were portraits of the family of the Butadae on the walls. Within it was also the gold lamp of Callimachus, which burnt for a year without refilling, and had a chimney in the form of a palm-tree.

The Erechtheum was damaged by a fire, soon after its completion, in 406 B.C., but was repaired early in the following century. The west end appears to have been damaged in Roman times and to have been replaced by the attached columns with windows between them which appear in old drawings and are still partially extant. It was used as a church in Christian times, and under Turkish rule as the harem of the governor of Athens. Lord Elgin carried off to London, about 1801-1803, one of the columns of the east portico and one of the caryatides; these were replaced later by terra-cotta casts. During the siege of the Acropolis in 1827, the roof of the north portico was thrown down and the building was otherwise much damaged. It was partially rebuilt between 1838 and 1846; the west front was blown down in a storm in 1852. Since 1900 the project of rebuilding the Erechtheum as far as possible with the original blocks has again been undertaken.

See Stuart, *Antiquities of Athens*; Inwood, *The Erechtheum*; H. Forster in *Papers of American School at Athens*, i. (1882-1883); J.H. Middleton, *Plans and Drawings of Athenian Buildings* (1900), pls. xiv.-xxii.; E.A. Gardner, *Ancient Athens*, chap. viii.; W. Dörpfeld, “Der ursprungliche Plan des Erechtheion” in *Mitteil. Athen.*, 1904, p. 101, taf. 6; G.P. Stevens, “The East Wall of the Erechtheum,” in *American Journ. Arch.*, 1906, pls. vi.-ix.

(E. Gr.)

ERECHTHEUS, in Greek legend, a mythical king of Athens, originally identified with Erichthonius, but in later times distinguished from him. According to Homer, who knows nothing of Erichthonius, he was the son of Aroura (Earth), brought up by Athena, with whom his story is closely connected. In the later story, Erichthonius (son of Hephaestus and Atthis or Athena herself) was handed over by Athena to the three daughters of Cecrops—Aglauros (or Agraulos), Herse and Pandrosos—in a chest, which they were forbidden to open. Aglauros and Herse disobeyed the injunction, and when they saw the child (which had the form of a snake, or round which a snake was coiled) they went mad with fright, and threw themselves from the rock of the Acropolis (or were killed by the snake). Athena herself then undertook the care of Erichthonius, who, when he grew up, drove out Amphictyon and took possession of the kingdom of Athens. Here he established the worship of Athena, instituted the Panathenaea, and built an Erechtheum. The Erechtheus of later times was supposed to be the grandson of Erechtheus-Erichthonius, and was also king of Athens. When Athens was attacked by the Thracian Eumolpus (or by the Eleusinians assisted by Eumolpus) victory was promised Erechtheus if he sacrificed one of his daughters. Eumolpus was slain and Erechtheus was victorious, but was himself killed by Poseidon, the father of Eumolpus, or by a thunderbolt from Zeus. The contest between Erechtheus and Eumolpus formed the subject of a lost tragedy by Euripides; Swinburne has utilized the legend in his *Erechtheus*. The scene of the opening of the chest is represented on a Greek vase in the British Museum. The name Erichthonius is connected with χθών (“earth”) and the representation of him as half-snake, like Cecrops, indicates that he was regarded as one of the autochthones, the ancestors of the Athenians who sprung from the soil.

See Apollodorus iii. 14. 15; Euripides, *Ion*; Ovid, *Metam.* ii. 553; Hyginus, *Poët. astron.* ii. 13; Pausanias i. 2. 5. 8; E. Ermatinger, *Die attische Autochthonensage* (1897); article by J.A. Hild in Daremberg and Saglio’s *Dictionnaire des antiquités*; B. Powell in *Cornell Studies*, xvii. (1906), who identifies Erechtheus, Erichthonius, Poseidon and Cecrops, all denoting the sacred serpent of Athena, whose cult she first contested, but then amalgamated with her own. The birth of Erichthonius (as a corn-spirit) is interpreted by Mannhardt as a mythical way of describing the growth of the corn, and by J.E. Harrison (*Myths and Monuments of Ancient Athens*, xxvii.-xxxvi.) as a fiction to explain the ceremony performed by the two maidens called Arrephori. See also Farnell, *Cults of the Greek States*, i. 270; and Frazer’s *Pausanias*, ii. 169.

ERESHKIGAL, also known as Allatu, the name of the chief Babylonian goddess of the nether-world where the dead are gathered. Her name signifies “lady of the nether-world.” She is known to us chiefly through two myths, both symbolizing the change of seasons, but intended also to illustrate certain doctrines developed in the temple-schools of Babylonia. One of these myths is the famous story of Ishtar’s descent to Irkalla or Arālu, as the lower world was called, and her reception by her sister who presides over it; the other is the story of Nergal’s offence against Ereshkigal, his banishment to the kingdom controlled by the goddess and the reconciliation between Nergal and Ereshkigal through the latter’s offer to have Nergal share the honours of the rule over Irkalla. The story of Ishtar’s descent is told to illustrate the possibility of an escape from Irkalla, while the other myth is intended to reconcile the existence of two rulers of Irkalla—a goddess and a god.

It is evident that it was originally a goddess who was supposed to be in control of Irkalla, corresponding to Ishtar in control of fertility and vegetation on earth. Ereshkigal is therefore the sister of Ishtar and from one point of view her counterpart, the symbol of nature during the non-productive season of the year. As the doctrine of two kingdoms, one of this world and one of the world of the dead, becomes crystallized, the dominions of the two sisters are sharply differentiated from one another. The addition of Nergal represents the harmonizing tendency to unite with Ereshkigal as the queen of the nether-world the god who, in his character as god of war and of pestilence, conveys the living to Irkalla and thus becomes the one who presides over the dead.

(M. Ja.)

ERETRIA (mod. *Aletria*), an ancient coast town of Euboea about 15 m. S.E. of Chalcis, opposite to Oropus. Eretria, like its neighbour Chalcis (*q.v.*), early entered upon a commercial and colonizing career. Besides founding townships in the west and north of Greece, it acquired dependencies among the Cyclades and joined the great mercantile alliance of Miletus and Aegina. Since the so-called Lelantine War (7th century B.C.) against the coming league of Chalcis, it began to be overshadowed by its rivals. The interference of Eretria in the Ionian revolt (498) brought upon it the vengeance of the Persians, who captured and destroyed it shortly before the battle of Marathon (490). The city was soon rebuilt, and as a member of both the Delian Leagues attached itself by numerous treaties to the Athenians. The latter, through their general Phocion, rescued it from the tyrants suborned by Philip of Macedon (354 and 341). Under Macedonian and Roman rule Eretria fell into insignificance; for a

short period under Mark Antony, the triumvir, it became a possession of Athens. Eretria was the birthplace of the tragedian Achaeus and of the "Megarian" philosopher Menedemus.

The modern village, which is sometimes called Nea Psará because the inhabitants of Psará were transferred there in 1821, is on unhealthy low-lying ground near the sea. The excavation of the site was carried out by the American School of Athens (1890-1895). At the foot of the Acropolis Hill, where the ground begins to rise, the theatre lies; and though the material of which this was built is rough, and only seven imperfect rows of seats remain, a good part of the scena and of the chambers behind it is preserved, and beneath these there runs a tunnel, which, together with other peculiar features, has raised interesting questions in connexion with the arrangement of the Greek theatre, the orchestra being at present on a level about 12 ft. below that of the rooms in the scena. Near by are the substructions of a temple of Dionysus and a large altar, and also a gymnasium with arrangements for bathing. Besides these, in 1900 the substructions of a temple of Apollo Daphnephoros were unearthed. Both the northern and the southern side of the hill are flanked by walls, which seem to have reached the sea, where there was a mole and a harbour; and the wall of the acropolis itself remains in one part to the height of eight courses.

AUTHORITIES.—Strabo x. 447 f.; Herodotus v. 99, vi. 101; *Corpus Inscr. Atticarum*, i. 339, iv. (2), pp. 5, 10, 22; H. Heinze, *De rebus Eretriensium* (Göttingen, 1869); W.M. Leake, *Travels in Northern Greece* (London, 1835), ii. 266, 443; B.V. Head, *Historia numorum* (Oxford, 1887), pp. 305-308; *Papers of the American School at Athens*, vol. vi.

(E. GR.)

ERETRIAN SCHOOL OF PHILOSOPHY. This Greek school was the continuation of the Elian school, which was transferred to Eretria by Menedemus. It was of small importance, and in the absence of certain knowledge must be supposed to have adhered to the doctrines of Socrates. (See MENEDEMUS.)

ERFURT, a city of Germany, in Prussian Saxony, on the Gera, and the railway Halle-Bebra, about midway between Gotha and Weimar, which are 14 m. distant. Pop. (1875) 48,025; (1905) 100,065. The city, which is dominated on the west by the two citadels of Petersberg and Cyriaxburg, is 737 irregularly built, the only feature in its plan, or want of plan, being the Friedrich Wilhelmsplatz, a broad open space of irregular shape abutting on the Petersberg. On the south-western side of this square, which contains a monument to the elector Frederick Charles Joseph of Mainz (1719-1802), is the Domberg, an eminence on which stand, side by side, the cathedral and the great church of St Severus with its three spires (14th century). The churches are approached by a flight of forty-eight stone steps, the grouping of the whole mass of buildings being exceedingly impressive. The cathedral (*Beatae Mariae Virginis*) is one of the finest churches in Germany. It was begun in the 12th century, but the nave was rebuilt in the 13th in the Gothic style. The magnificent chancel (1349-1372), with the 14th-century crypt below, rests on massive substructures, known as the *Cavate*. The twin towers are set between the chancel and nave. The cathedral contains, besides fine 15th-century glass, some very rich portal sculptures and bronze castings, among others the coronation of the Virgin by Peter Vischer. In one of its towers is the famous bell, called Maria Gloriosa, which bears the date 1497, and weighs 270 cwt. Besides the cathedral and St Severus, which are Roman Catholic, Erfurt possesses several very interesting medieval churches, now Evangelical. Among these may be mentioned the Predigerkirche, dating from the latter half of the 12th century; the Reglerkirche, a Romanesque building (restored in 1859) with a 12th-century tower; and the Barfüsserkirche, a Gothic building containing fine 14th-century monuments. All these were originally monastic churches. Of the former religious houses there survive a Franciscan convent, with a girls' school attached, and an Ursuline convent. The Augustinian monastery, in which Luther lived as a friar, is now used as an orphanage, under the name of the *Martinsstift*. The cell of Luther was destroyed by fire in 1872. A bronze statue of the reformer was erected in the Anger, the chief street of the town, in 1890. At one time Erfurt had a university, of which the charter dated from 1392; but it was suppressed in 1816, and its funds devoted to other purposes, among these being the endowment of an institution founded in 1758 and now called the royal academy of sciences, and the support of the royal library, which now contains 60,000 volumes and over 1000 manuscripts. On the W. and S.W. extensive new quarters have grown up within recent years, *e.g.* Hirschbrühl. The interior of the town hall (1869-1875) is adorned with legendary and historical frescoes by Kämpfer and Peter Janssen. Erfurt possesses also a picture gallery and an antiquarian collection.

The educational establishments of the town include a gymnasium, a realgymnasium, a realschule, technical schools for building and handicrafts, a high-class commercial school, a school of

agriculture, and an academy of music. The most notable industry of Erfurt is the culture of flowers and of vegetables, which is very extensively carried on. This industry had its origin in the large gardens attached to the monasteries. It has also important and growing manufactures of ladies' mantles, boots and shoes, machines, furniture, woollen goods, musical instruments, agricultural machinery and implements, leather, tobacco, chemicals, &c. Brewing, bleaching and dyeing are also carried on on a large scale, and there are extensive railway works and a government rifle factory.

Erfurt (Med. *Erpesfurt*, *Erphorde*, Lat. *Erfordia*) is a town of great antiquity. Its origin is obscure, but in 741 it was sufficiently important for St Boniface to found a bishopric here, which was, however, after the martyrdom of the first bishop, Adolar, in 755, reabsorbed in that of Mainz. In 805 the place received certain market rights from the emperor Charlemagne. Later the overlordship was claimed by the archbishops of Mainz, on the strength of charters granted by the emperor Otto I., and their authority in Erfurt was maintained by a burgrave and an *advocatus*, the office of the latter becoming in the 12th century hereditary in the family of the counts of Gleichen. In spite of many vicissitudes (from 1109 to 1137, for instance, the town was subject to the landgraves of Thuringia), and of a charter granted in 1242 by the emperor Frederick II., the archbishops succeeded in upholding their claims. In 1255, however, Archbishop Gerhard I. had to grant the city municipal rights, the burgraviate disappeared, and Erfurt became practically a free town. Its power was at its height early in the 15th century, when it joined the Hanseatic League. It had acquired by force or purchase various countships and other fiefs in the neighbourhood, and ruled a considerable territory; and its wealth was so great that in 1378 it established a university, the first in Europe that embraced the four faculties. By the end of the century, however, its prosperity had sunk owing to the perpetual feud with Mainz, the internecine war in Saxony, and the consequent dwindling of trade. By the convention of Amorbach in 1483 the overlordship of Erfurt was ultimately transferred by the electors of Mainz to Saxony. The political and religious quarrels of the 16th century still further depressed the city, in which the reformed religion was established in 1521. Then came the Thirty Years' War, during which Erfurt was for a while occupied by the Swedes. After the peace of Westphalia (1648) the city was assigned by the emperor to the elector of Mainz, and, on its refusal to submit, it was placed under the ban of the Empire (1660). In 1664 it was captured by the troops of the archbishop of Mainz, and remained in the possession of the electorate till 1802, when it came into the possession of Prussia. In 1808 it was the scene of the memorable interview between Napoleon and the emperor Alexander I. of Russia, at which the kings of Bavaria, Saxony, Westphalia and Württemberg also assisted, which is known as the congress of Erfurt. Here in 1850 the parliament of the short-lived Prussian Northern Union (known as the Erfurt parliament) held its sittings. In 1902 the 100th anniversary of the city's incorporation with Prussia was celebrated.

See W.J.A. von Tettau, *Erfurt in seiner Vergangenheit und Gegenwart* (Erfurt, 1880); C. Beyer, *Geschichte der Stadt Erfurt* (Erfurt, 1900); and F.W. Kampschulte, *Die Universität Erfurt in ihrem Verhältnisse zu dem Humanismus und der Reformation* (1856-1858). For a detailed bibliography see U. Chevalier, *Répertoire des sources. Topo-bibliographie* (Montebéliard, 1894-1899), s.v.

ERGOT, or Spurred Rye, the drug *ergota* or *Secale cornutum* (Ger. *Mutterkorn*; Fr. *seigle ergoté*), consisting of the sclerotium (or hard resting condition) of a fungus, *Claviceps purpurea*, parasitic on the pistils of many members of the Grass family, but obtained almost exclusively from rye, *Secale cereale*. In the ear of rye that is infected with ergot a species of fermentation takes place, and there exudes from it a sweet yellowish mucus, which after a time disappears. The ear loses its starch, and ceases to grow, and its ovaries become penetrated with the white spongy tissue of the mycelium of the fungus which towards the end of the season forms the sclerotium, in which state the fungus lies dormant through the winter.

The drug consists of grains, usually curved (hence the name, from the O. Fr. *argot*, a cock's spur), which are violet-black or dark-purple externally, and whitish with a tinge of pink within, are between ⅓ and 1½ in. long, and from 1 to 4 lines broad, and have two lateral furrows, a close fracture, a disagreeable rancid taste, and a faint, fishy odour, which last becomes more perceptible when the powder of the drug is mixed with potash solution. Ergot should be kept in stoppered bottles in order to preserve it from the attacks of a species of mite, and to prevent the oxidation of its fatty oil.

The extremely complex composition of this drug has been studied in great detail, and with such important results that instead of giving ergot itself by the mouth in doses of 20 to 60 grains, it is now possible to obtain much more rapid and certain results by giving one three-hundredth of a grain of one of its constituents hypodermically. This constituent is the alkaloid cornutine, which is the valuable ingredient of the drug. Other ingredients are a fixed oil, present to the extent of 30%, ergotinic acid, a glucoside, trimethylamine, which gives the drug its unpleasant odour, and sphacelinic acid, a non-nitrogenous resinoid body. Of the numerous preparations only two need be mentioned—the liquid extract (dose 10 minims to 2 drachms or more), and the hypodermic injection. The latter does not keep well, and the best way of using ergot is to dissolve tablets obtained from a reputable maker, and containing some of the active principles, in pure water, the solution being

injected subcutaneously.

Ergot has no external action. Given internally it stimulates the intestinal muscles and may cause diarrhoea. After absorption it slows the pulse by stimulation of the vagus nerves. It has indeed been asserted that the slow pulse characteristic of the puerperal period is really due to the common administration of ergot at that time. This is probably an exaggeration. The important actions of ergot are on the blood-vessels and the uterus. The drug greatly raises the blood-pressure by causing extreme contraction of the arteries. This is mainly due to a direct action on the muscular coats of the vessels, but is also partly of central origin, since the drug also stimulates the vaso-motor centre in the medulla oblongata. This action on the vessels is so marked as to constitute the drug a haemostatic, not only locally but also remotely. It may arrest bleeding from the nose, for instance, when injected hypodermically. Nearly all the constituents share in causing this action, but the sphacelinic acid is probably the most potent. Ergot is the most powerful known stimulant of the pregnant uterus. The action is a double one. At least four of its constituents act directly on the muscular fibre of the uterus, whilst the cornutine acts through the nerves. Of great practical importance is the fact that the cornutine causes rhythmic contractions such as naturally occur, whilst the sphacelinic acid produces a *tonic* contraction of the uterus, which is unnatural and highly inimical to the life of the foetus. Ergot is used in therapeutics as a haemostatic, and is very valuable in haemoptysis and sometimes in haematemesis. But its great use is in obstetrics. The drug should regularly be given hypodermically, and it is important to note that if the injection be made immediately under the skin, an abscess, or considerable discomfort, may ensue. The injection should be intra-muscular, the needle being boldly plunged into a muscular mass, such as that of the deltoid or the gluteal region. The indications for the use of ergot in obstetrics are highly complex and demand detailed treatment. It can only be said here that the drug should only in the rarest possible cases be given whilst the child is still *in utero*. This rule is necessitated by the sphacelinic acid, which causes an unnatural state of the organ. When it is possible to obtain pure cornutine, which is unfortunately very expensive, the precautions necessary in other cases may be abrogated.

Chronic poisoning, or *ergotism*, used frequently to occur amongst the poor fed on rye infected with the *Claviceps*. As it is practically impossible to reproduce the symptoms of ergotism nowadays, whether experimentally in the lower animals, or when the drug is being administered to a human being for some therapeutic purpose, it is believed that the symptoms of ergotism were rendered possible only by the semi-starvation which must have ensued from the use of such rye-bread; for the grain disappears as the fungus develops. There were two types of ergotism. In the gangrenous form various parts of the body underwent gangrene as a consequence of the arrest of blood-supply produced by the action of sphacelinic acid on the arteries. In the spasmodic form the symptoms were of a nervous character. The initial indications of the disease were cutaneous itching, tingling and formication, which gave place to actual loss of cutaneous sensation, first observed in the extremities. Amblyopia and some loss of hearing also occurred, as well as mental failure. With weakness of the voluntary muscles went intermittent spasms which weakened the patient and ultimately led to death by implication of the respiratory muscles. The last-known “epidemic” of ergotism occurred in Lorraine and Burgundy in the year 1816.

ERIC XIV. (1533-1577), king of Sweden, was the only son of Gustavus Vasa and Catherine of Saxe-Lauenburg. The news of his father’s death reached Eric as he was on the point of embarking for England to press in person his suit for the hand of Queen Elizabeth. He hastened back to Stockholm, after burying his father, summoned a *Riksdag*, which met at Arboga on the 15th of April 1561, and adopted the royal propositions known as the Arboga articles, considerably curtailing the authority of the royal dukes, John and Charles, in their respective provinces. Two months later Eric was crowned at Upsala, on which occasion he first introduced the titles of baron and count into Sweden, by way of attaching to the crown the higher nobility, these new counts and barons receiving lucrative fiefs adequate to the maintenance of their new dignities.

From the very beginning of his reign Eric’s morbid fear of the upper classes drove him to give his absolute confidence to a man of base origin and bad character, though, it must be admitted, of superior ability. This was Göran Persson, born about 1530, who had been educated abroad in Lutheran principles, and after narrowly escaping hanging at the hands of Gustavus Vasa for some vile action entered the service of his son. This powerful upstart was the natural enemy of the nobility, who suffered much at his hands, though it is very difficult to determine whether the initiative in these prosecutions proceeded from him or his master. Göran was also a determined opponent of Duke John, with whom Eric in 1563 openly quarrelled, because John, contrary to the royal orders, had married (Oct. 4, 1562) Catherine, daughter of Sigismund I. of Poland, engaging at the same time to assist the Polish king to conquer Livonia. This act was a flagrant breach of that paragraph of the Arboga articles which forbade the royal dukes to contract any political treaty without the royal assent. An army of 10,000 men was immediately sent by Eric to John’s duchy of Finland, and John and his consort were seized, brought over to Sweden and detained as prisoners of state in Gripsholm Castle. But Eric did not stop here. His suspicion suggested to him that, if his own brother failed him, the

loyalty of the great nobles, especially the members of the ancient Sture family, who had been notable in Sweden when the Vasas were unknown, could not be depended upon. The head of the Sture family at this time was Count Svante, who had married a sister of Gustavus Vasa's second wife, and had by her a numerous family, of whom two sons, Nils and Eric, still survived. The dark tragedy, known as the Sture murders, began with Eric XIV.'s strange treatment of young Count Nils. In 1566 he was summoned before a newly erected tribunal and condemned to death for gross neglect of duty, though not one of the frivolous charges brought against him could be substantiated. The death penalty was commuted into a punishment worse because more shameful than death. On the 15th of June 1566 the unfortunate youth, bruised and bleeding from shocking ill-treatment, was placed upon a wretched hack, with a crown of straw on his head, and led in derision through the streets of Stockholm. The following night he was sent a prisoner to the fortress of Örbyhus. A few days later he was appointed ambassador extraordinary, and despatched to Lorraine to resume the negotiations for Eric's marriage with the princess Renata. Before he returned, however, Eric had resolved to marry Karin, or Kitty Månsdatter, the daughter of a common soldier, who had been his mistress since 1565. In January 1567 Eric extorted a declaration from two of his senators that they would assist him to punish all who should try to prevent his projected marriage; and, in the middle of May, a *Riksdag* was summoned to Upsala to judge between the king and those of the aristocracy whom he regarded as his personal enemies. Eric himself arrived at Upsala on the 16th in a condition of incipient insanity. On the 19th he opened parliament in a speech which, as he explained, he had to deliver extempore owing to "the treachery" of his secretary. Two days later Nils Sture arrived at Upsala fresh from his embassy to Lorraine, and was at once thrown into prison, where other members of the nobility were already detained. On the following day Eric murdered Nils in his cell with his own hand, and by his order the other prisoners were despatched by the royal provost marshal forthwith. These murders were committed so promptly and secretly that it is doubtful whether the estates, actually in session at the same place, knew what had been done when, on the 26th of May, under violent pressure from Göran Persson, they signed a document declaring that all the accused gentlemen under detention had acted like traitors, and confirming all sentences already passed or that might be passed upon them.

During the greater part of 1567 Eric was so deranged that a committee of senators was appointed to govern the kingdom. One of his illusions was that not he was king but his brother John, whom he now set at liberty. When, at the beginning of 1568, Eric recovered his reason, a reconciliation was effected between the king and the duke, on condition that John recognized the legality of his brother's marriage with Karin Månsdatter, and her children as the successors to the throne. A month later, on the 4th of July, he was solemnly married to Karin at Stockholm by the primate. The next day Karin was crowned queen of Sweden and her infant son Gustavus proclaimed prince-royal. Shortly after his marriage Eric issued a circular ordering a general thanksgiving for his delivery from the assaults of the devil. This document, in every line of which madness is legible, convinced most thinking people that Eric was unfit to reign. The royal dukes, John and Charles, had already taken measures to depose him; and in July the rebellion broke out in Östergötland. Eric at first offered a stout resistance and won two victories; but on the 17th of September the dukes stood before Stockholm, and Eric, after surrendering Göran Persson to the horrible vengeance of his enemies, himself submitted, and resigned the crown. On the 30th of September 1568 John III. was proclaimed king by the army and the nobility; and a *Riksdag*, summoned to Stockholm, confirmed the choice and formally deposed Eric on the 25th of January 1569. For the next seven years the ex-king was a source of the utmost anxiety to the new government. No fewer than three rebellions, with the object of releasing and reinstating him, had to be suppressed, and his prison was changed half a dozen times. On the 10th of March 1575, an assembly of notables, lay and clerical, at John's request, pronounced a formal sentence of death upon him. Two years later, on the 24th of February 1577, he died suddenly in his new prison at Örbyhus, poisoned, it is said, by his governor, Johan Henriksen.

See *Sveriges Historia*, vol. iii. (Stockholm, 1880); Robert Nisbet Bain, *Scandinavia*, cap. 4-6 (Cambridge, 1905); Eric Tegel, *Konung Eriks den XIV. historia* (Stockholm, 1751).

(R. N. B.)

ERICACEAE, in botany, a natural order of plants belonging to the higher or gamopetalous division of Dicotyledons. They are woody plants, sometimes with a slender creeping stem as in bilberry, *Vaccinium* (fig. 1), or *Andromeda* (fig. 2), or forming low bushes as in the heaths, or larger, sometimes becoming tree-like, as in species of *Rhododendron*. The leaves are alternate, opposite or whorled in arrangement, and in their form and structure show well-marked adaptation for life in dry or exposed situations. Thus in the true heaths they are needle-like, with the margins often rolled back to form a groove or an almost closed chamber on the under side. In others

such as *Rhododendron* or *Arbutus* they are often leathery and evergreen, the strongly cuticularized upper surface protecting a water-storing tissue situated above the green layers of the leaf. The flowers are sometimes solitary and axillary or terminal as in *Andromeda*, but are generally arranged in racemose inflorescences at the end of the branches as in *Arbutus* and *Rhododendron*, or on small lateral shoots as in *Erica*. They are hermaphrodite and generally regular with parts in 4 or 5, thus: sepals 4 or 5, petals 4 or 5, stamens 8 or 10 in two series, the outer of which is opposite the petals, and carpels 4 or 5. The corolla is usually more or less bell-shaped, and in the heaths persists in a dry state in the fruit. The petals with the stamens are situated on the outer edge of a honey-secreting disk. The anthers show a very great variety in shape, the halves are often more or less free and often appendaged; they open to allow the escape of the pollen by a terminal pore or slit. The carpels are united to form a 4- to 5-chambered ovary, which bears a simple elongated style ending in a capitate stigma; each ovary-chamber contains one to many ovules attached to a central placenta. The brightly coloured corolla, the presence of nectar and the scent render the flowers attractive to insects, and the projection of the stigma beyond the anthers favours crossing. The fruit is generally a capsule containing many seeds, as in *Erica* (fig. 3) or *Rhododendron*; sometimes a berry as in *Arbutus*.

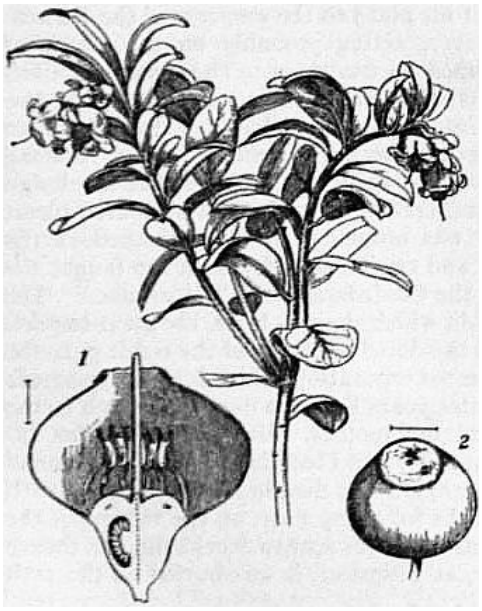


FIG. 1.—*Vaccinium vitis-idaea*, with leaf and flower, nat. size. 1, Flower of *V. myrtillus*, cut lengthwise. 2, Fruit of same.

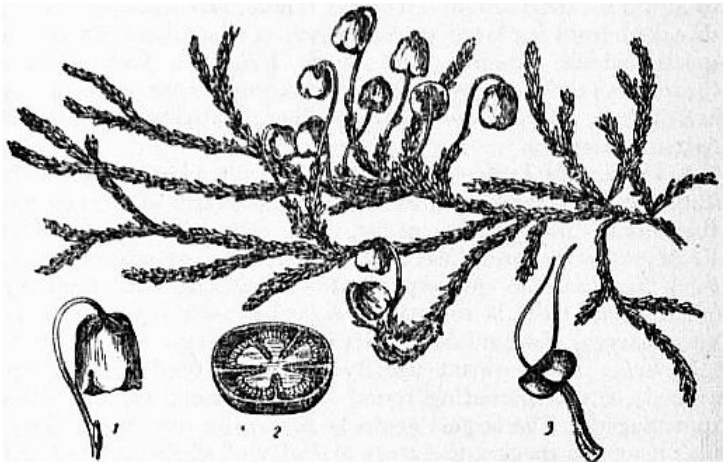


FIG. 2.—*Andromeda Hypnoides*, nat. size. 1, Flower; 2, Unripe fruit cut across; 3, Stamen—all enlarged.

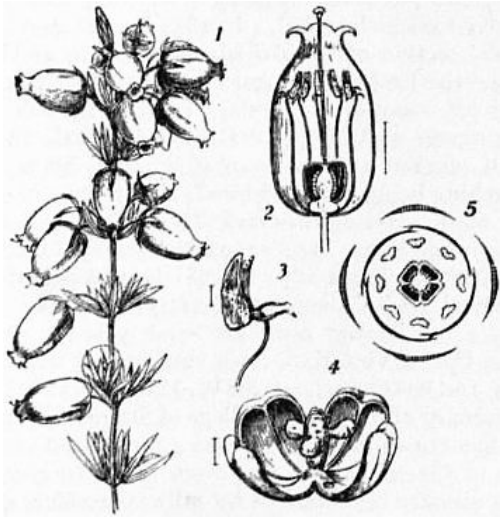


FIG. 3.

1, Flowering shoot of *Erica cinerea*, about 1½ nat. size.
2, Flower cut lengthwise.
3, Stamen showing
4, Capsule showing the loculicidal dehiscence; a few seeds remain attached to the central axis.

appendages and porous dehiscence of anther.

5, Diagram of the flower having four sepals, four divisions of the corolla, eight stamens in two rows, and four divisions of the pistil.

The order falls into four distinct tribes, which are characterized by the relative position of the ovary and by the fruit and seed. They are as follows:—

1. *Rhododendron tribe,* characterized by capsular fruit, seed with a loose coat, deciduous petals and anthers without appendages. It consists mainly of the great genus *Rhododendron* (in which *Azalea* is included by recent botanists), which is chiefly developed in the mountains of eastern Asia, many species occurring on the Himalayas. *Dabeocia*, St Dabeoc's heath, occurs in Ireland.

2. *Arbutus Tribe.*—Fruit a berry or capsule, petals deciduous and anthers with bristle-like appendages, chiefly north temperate to arctic in distribution. *Arbutus Unedo*, the strawberry-tree, so called from its large scarlet berry, is a southern European species which extends into south Ireland. *Arctostaphylos* (bearberry) and *Andromeda* are arctic and alpine genera occurring in Britain. *Epigaea repens* is the trailing arbutus or mayflower of Atlantic America.

3. *Vaccinium Tribe.*—Ovary inferior, fruit a berry. Extends from the north temperate zone to the mountains of the tropics. *Vaccinium*, the largest genus, has four British species: *V. Myrtillus* is the bilberry(*q.v.*), blaeberry or whortleberry, *V. Vitis-Idaea* the cowberry, and *V. Oxycoccos* the cranberry (*q.v.*). This tribe is sometimes regarded as a separate order Vacciniaceae, distinguished by its inferior ovary.

4. *Erica Tribe.*—Fruit usually a capsule, seeds round, not winged; corolla persisting round the ripe fruit; anthers often appendaged. The largest genus is *Erica*, the true heath (*q.v.*), with over 400 species, the great majority of which are confined to the Cape; others occur on the mountains of tropical Africa and in Europe and North Africa, especially the Mediterranean region. *E. cinerea* (purple heather) and *E. Tetralix* (cross-leaved heath) are common British heaths. *Calluna* is the ling or Scotch heather.

ERICHSEN, SIR JOHN ERIC, Bart. (1818-1896), British surgeon, born on the 19th of July 1818 at Copenhagen, was the son of Eric Erichsen, a member of a well-known Danish family. He studied medicine at University College, London, and at Paris, devoting himself in the early years of his career to physiology, and lecturing on general anatomy and physiology at University College hospital. In 1844 he was secretary to the physiological section of the British Association, and in 1845 he was awarded the Fothergillian gold medal of the Royal Humane Society for his essay on asphyxia. In 1848 he was appointed assistant surgeon at University College hospital, and in 1850 became full surgeon and professor of surgery, his lectures and clinical teaching being much admired; and in 1875 he joined the consulting staff. His *Science and Art of Surgery* (1853) went through many editions. He rose to be president of the College of Surgeons in 1880. From 1879 to 1881 he was president of the Royal Medical and Chirurgical Society. He was created a baronet in 1895, having been for some years surgeon-extraordinary to Queen Victoria. As a surgeon his reputation was world-wide, and he counts (says Sir W. MacCormac in his volume on the Centenary of the Royal College of Surgeons) "among the makers of modern surgery." He was a recognized authority on concussion of the spine, and was often called to give evidence in court on obscure cases caused by railway accidents, &c. He died at Folkestone on the 23rd of September 1896.

ERICHT, LOCH, a lake partly in Inverness-shire and partly in Perthshire, Scotland, lying between the districts of Badenoch on the N. and Rannoch on the S. The boundary line is drawn from a point opposite to the mouth of the Alder, and follows the centre of the longitudinal axis north-eastwards to 56° 50′ N., where it strikes eastwards to the shore. All of the lake to the S. and E. of this line belongs to Perthshire, the rest, forming the major portion, to Inverness-shire. It is a lonely lake, situated in extremely wild surroundings at a height of 1153 ft. above the sea, being thus the loftiest lake of large size in the United Kingdom. It is over 14½ m. long, with a mean breadth of half a mile and over 1 m. at its maximum. Its area amounts to some 7¼ sq. m., and it receives the drainage of an area of nearly

50½ sq. m. The mean depth is 189 ft., and the maximum 512 ft. It has a general trend from N.E. to S.W., the head lying 1 m. from Dalwhinnie station on the Highland railway. It receives many streams, and discharges at the south-western extremity by the Ericht. Salmon and trout afford good fishing. The surrounding mountains are lofty and rugged. Ben Alder (3757 ft.) on the west shore is the chief feature of the great Corrour deer forest. The only point of interest on the banks is the cavern, near the mouth of the Alder, in which Prince Charles Edward concealed himself for a time after the battle of Culloden.

ERICSSON, JOHN (1803-1889), Swedish-American naval engineer, was born at Langbanshyttan, Wermland, Sweden, on the 31st of July 1803. He was the second son of Olaf Ericsson, an inspector of mines, who died in 1818. Showing from his earliest years a strong mechanical bent, young Ericsson, at the age of twelve, was employed as a draughtsman by the Swedish Canal Company. From 1820 to 1827 he served in the army, where his drawing and military maps attracted the attention of the king, and he soon attained the rank of captain. In 1826 he went to London, at first on leave of absence from his regiment, and in partnership with John Braithwaite constructed the “Novelty,” a locomotive engine for the Liverpool & Manchester railway competition at Rainhill in 1829, when the prize, however, was won by Stephenson’s “Rocket.” The number of Ericsson’s inventions at this period was very great. Among other things he worked out a plan for marine engines placed entirely below the water-line. Such engines were made for the “Victory,” for Captain (afterwards Sir) John Ross’s voyage to the Arctic regions in 1829, but they did not prove satisfactory. In 1833 his caloric engine was made public. In 1836 he took out a patent for a screw-propeller, and though the priority of his invention could not be maintained, he was afterwards awarded a one-fifth share of the £20,000 given by the Admiralty for it. At this time Captain Stockton, of the United States navy, gave an order for a small iron vessel to be built by Laird of Birkenhead, and to be fitted by Ericsson with engines and screw. This vessel reached New York in May 1839. A few months later Ericsson followed his steamer to New York, and there he resided for the rest of his life, establishing himself as an engineer and a builder of iron ships. In 1848 he was naturalized as a citizen of the United States. He had many difficulties to contend with, and it was only by slow degrees that he established his fame and won his way to competence. At his death he seems to have been worth about £50,000. The provision of defensive armour for ships of war had long occupied his attention, and he had constructed plans and a model of a vessel lying low in the water, carrying one heavy gun in a circular turret mounted on a turntable. In 1854 he sent his plans to the emperor of the French. Louis Napoleon, however, acting probably on the advice of Dupuy de Lôme, declined to use them. The American Civil War, and the report that the Confederates were converting the “Merrimac” into an ironclad, caused the navy department to invite proposals for the construction of armoured ships. Among others, Ericsson replied, and as it was thought that his design might be serviceable in inland waters, the first armoured turret ship, the “Monitor,” was ordered; she was launched on the 30th of January 1862, and on the 9th of March she fought the celebrated action with the Confederate ram “Merrimac.” The peculiar circumstances in which she was built, the great importance of the battle, and the decisive nature of the result gave the “Monitor” an exaggerated reputation, which further experience did not confirm. In later years Ericsson devoted himself to the study of torpedoes and sun motors. He published *Solar Investigations* (New York, 1875) and *Contributions to the Centennial Exhibition* (New York, 1877). He died in New York on the 8th of March 1889, and in the following year, on the request of the Swedish government, his body was sent to Stockholm and thence into Wermland, where, at Filipstad, it was buried on the 15th of September.

A *Life of Ericsson* by William Conant Church was published in New York in 1890 and in London in 1893.

ERIDANUS, or Fluvius (“the river”), in astronomy, a constellation of the southern hemisphere, mentioned by Eudoxus (4th century B.C.) and Aratus (3rd century B.C.); Ptolemy catalogued 34 stars in it. θ *Eridani*, a fine double star of magnitudes 3.5 and 5.5, is now of the third magnitude. It is supposed to be identical with the *Achernar* of Al-Sufi, who described it as of the first magnitude; this star has therefore decreased in brilliancy in historic times. The star o_2 *Eridani* (numbered 40 by Flamsteed) was discovered to be a ternary star group by Herschel in 1783; it consists of a close pair, of magnitudes 9.2 and 10.9, revolving in a period of 180 years, associated with a star of magnitude 4.5, which is distant from the pair by 82″; these stars have an exceptionally swift proper motion, about 4″ per annum. Eridanus was the ancient name of the river Po.

ERIDU, one of the oldest religious centres of the Sumerians, described in the ancient Babylonian records as the “city of the deep.” The special god of this city was Ea (*q.v.*), god of the sea and of wisdom, and the prominence given to this god in the incantation literature of Babylonia and Assyria suggests not only that many of our magical texts are to be traced ultimately to the temple of Ea at Eridu, but that this side of the Babylonian religion had its origin in that place. Certain of the most ancient Babylonian myths, especially that of Adapa, may also be traced back to the shrine of Ea at Eridu. But while of the first importance in matters of religion, there is no evidence in Babylonian literature of any special political importance attaching to Eridu, and certainly at no time within our knowledge did it exercise hegemony in Babylonia. The site of Eridu was discovered by J.E. Taylor in 1854, in a ruin then called by the natives Abu-Shahrein, a few miles south-south-west of Moghair, ancient Ur, nearly in the centre of the dry bed of an inland sea, a deep valley, 15 m. at its broadest, covered for the most part with a nitrous incrustation, separated from the alluvial plain about Moghair by a low, pebbly, sandstone range, called the Hazem, but open toward the north to the Euphrates and stretching southward to the Khanega wadi below Suk-esh-Sheiukh. In the rainy season this valley becomes a sea, flooded by the discharge of the Khanega; in summer the Arabs dig holes here which supply them with brackish water. The ruins, in which Taylor conducted brief excavations, consist of a platform of fine sand enclosed by a sandstone wall, 20 ft. high, the corners toward the cardinal points, on the N.W. part of which was a pyramidal tower of two stages, constructed of sun-dried brick, cased with a wall of kiln-burned brick, the whole still standing to a height of about 70 ft. above the platform. The summit of the first stage was reached by a staircase on the S.E. side, 15 ft. wide and 70 ft. long, constructed of polished marble slabs, fastened with copper bolts, flanked at the foot by two curious columns. An inclined road led up to the second stage on the N.W. side. Pieces of polished alabaster and marble, with small pieces of pure gold and gold-headed copper nails, found on and about the top of the second stage, indicated that a small but richly adorned sacred chamber, apparently plated within or without in gold, formerly crowned the top of this structure. Around the whole tower was a pavement of inscribed baked bricks, resting on a layer of clay 2 ft. thick. On the S.E. part of the terrace were the remains of several edifices, containing suites of rooms. Inscriptions on the bricks identified the site as that of Eridu. Since Taylor’s time the place has not been visited by any explorer, owing to the unsafe condition of the neighbourhood; but T.K. Loftus (1854) and J.P. Peters (1890) both report having seen it from the summit of Moghair. The latter states that the Arabs at that time called the ruin Nowawis, and apparently no longer knew the name Abu-Shahrein. Through an error, in many recent maps and Assyriological publications Eridu is described as located in the alluvial plain, between the Tigris and the Euphrates. It was, in fact, an island city in an estuary of the Persian Gulf, stretching up into the Arabian plateau. Originally “on the shore of the sea,” as the old records aver, it is now about 120 m. from the head of the Persian Gulf. Calculating from the present rate of deposit of alluvium at the head of that gulf, Eridu should have been founded as early as the seventh millennium B.C. It is mentioned in historical inscriptions from the earliest times onward, as late as the 6th century B.C. From the evidence of Taylor’s excavations, it would seem that the site was abandoned about the close of the Babylonian period.

See J.E. Taylor, *Journal of the Royal Asiatic Society*, vol. xv. (1855); F. Delitzsch, *Wo lag das Paradies?* (1881); J.P. Peters, *Nippur* (1897); M. Jastrow, *The Religion of Babylonia and Assyria* (1898); H.V. Hilprecht, *Excavations in Assyria and Babylonia* (1904); L.W. King, *A History of Sumer and Akkad* (1910).

(J. P. Pe.)

ERIE, the most southerly of the Great Lakes of North America, between 41° 23′ and 42° 53′ N., and 78° 51′ and 83° 28′ W., bounded W. by the state of Michigan, S. and S.E. by Ohio, Pennsylvania and New York, and N. by the province of Ontario. It is nearly elliptical, the major axis, 250 m. long, lying east and west; its greatest breadth is 60 m.; its area about 10,000 sq. m.; and the total area of its basin 34,412 sq. m. Its elevation above mean sea-level is 573 ft.; and its surface is nearly 9 ft. below that of Lake Huron, which discharges into it through St Clair river, Lake St Clair and Detroit river, and is 327 ft. above that of Lake Ontario, this great difference being absorbed by the rapids and falls in the Niagara river, which joins the two lakes. Lake Erie is very shallow, and may be divided into three basins, the western extending to Point Pelee and including all the islands, containing about 1200 sq. m., with a comparatively flat bottom at 5 to 6 fathoms; the main basin, between Point Pelee and the narrows at Long Point, containing about 6700 sq. m., and having a marked shelving bottom deepening gradually to 14 fathoms; and the portion east of the narrows, containing about 2100 sq. m., having a depression 30 fathoms deep just east from Long Point, with an extensive flat of 11 fathoms depth between it and the main basin. The Canadian shore is low and flat throughout, the United States shore is low but bordered by an elevated plateau through which the rivers have cut deep channels. The lake basin is relatively so small that the rivers are without importance; Grand river, on the north shore, is the largest tributary. The flat alluvial soil bordering on the lake is very fertile, and the climate is well adapted for fruit cultivation. Large quantities of peaches, grapes and small fruits are grown; the islands in the west end have a climate much warmer and more equable than the adjoining mainland, and are practically covered with vineyards. The low clayey or sandy

shores are subject to erosion by waves. In severe storms the water near shore is filled with sand, which is deposited where the currents are checked around the ends of jetties in such a way as to form bars out into the lake across improved channels. This shoaling has rendered continuous dredging necessary at every harbour on the lake west of Erie, Pa. In consequence of the shallowness of the lake its waters are easily disturbed, making navigation very rough and dangerous, and causing large fluctuations of surface. Strong winds are frequent, as nearly every cyclonic depression traversing North America, either from the westward or the Gulf of Mexico, passes near enough to Lake Erie to be felt. Westerly gales are more frequent, and have more effect on the water surface than easterly ones, lowering the water as much as 7 to 8 ft. at the west end and raising it 5 to 8 ft. at the east end. The worst storms occur in autumn, when the immense quantity of shipping on the lake makes them specially destructive. There are no tides, and usually only a slight current towards the outlet, though powerful currents are temporarily produced by the rapid return of waters after a storm, and during the height of a westerly gale there is invariably a reflex current into the west end of the lake. There is an annual fluctuation in the level of the lake, varying from a minimum of 9 in. to a maximum of 2 ft., the normal low level occurring in February and the high level in midsummer. Standard high water (of 1838) is 575.11 ft. above mean sea-level, and the lowest record was 570.8 in November 1895. The harbours and exits of the lake freeze over, but the body of the lake never freezes completely.

Ice-breaking car ferries run across the lake all winter. General navigation opens as a rule in the middle of April and closes in the middle of December. The volume of traffic is immense, because practically all freight from the more westerly lakes finds terminal harbours in Lake Erie. Official statistics of commerce passing through the Detroit river into the lake during the season of 1906 show that 35,128 vessels, having a net register of 50,673,897 tons, carried 63,805,571 (short) tons of freight, valued at $662,971,053. The 1175 vessels engaged in this business were valued at $106,223,000. Over 90% of the whole traffic is in United States ships to United States ports. Fine passenger steamers run nightly between Buffalo and Cleveland and Detroit, and there are many shorter passenger routes.

The large traffic on Lake Erie has brought into existence a number of important harbours on the south shore, nearly all artificially made and deepened, with entrances between two breakwaters running into the lake at right angles to the coast line. The principal of these are Toledo, Sandusky, Huron, Vermilion, Lorain, Cleveland, Fairport, Ashtabula, Conneaut, Erie (a natural harbour), Dunkirk and Buffalo, Rondeau, Port Stanley, Port Burwell, Port Dover, Port Maitland and Port Colborne. The Miami and Erie canal, leading from Maumee river to Cincinnati, 244½ m., with a branch to Port Jefferson, 14 m., with locks 90 by 15 by 4 ft., connects with Lake Erie through Toledo. The Erie canal leading from Buffalo to the Hudson river at Troy, and connecting with Lake Ontario at Oswego, had a capacity for boats 98 ft. long, 17 ft. 10 in. beam, with 6 ft. draught, until in 1907 the State of New York undertook its deepening to accommodate boats of 1000 tons capacity. Buffalo from its position at the eastern limit of deep draught lake navigation is a city of first rate commercial importance. Its harbour is formed by an artificial breakwater, built parallel with the shore about half a mile distant from it. It receives practically all the Lake Erie grain shipments besides large quantities of iron ore, lumber and copper, and is a large shipping port for coal, principally anthracite. It has over 600 m. of railway tracks to accommodate lake freights. The Welland canal, 26¾ m. long, connecting Lake Ontario and Lake Erie, with locks 270 by 45 by 14 ft., leaves Lake Erie at Port Colborne, where the Canadian government have constructed an artificial harbour and elevators for transhipment of grain from upper lake freighters to lighters of canal capacity.

Fishing operations are carried on extensively in Lake Erie, the fish being taken with gill nets, seines and pound nets. Each state touching the lake has its own fishery regulations, which differ amongst themselves as well as from those of the Dominion. Both nations maintain a Fishery Protection Service, and the fisheries are replenished from artificial hatcheries. The most numerous and valuable fish are the lesser white fish (*Coregonus artedi*, Le Sueur), pickerel (*Stizostedion vitreum*, Walb.), pike (*Lucius lucius*, L.), and white fish (*Coregonus clupeiformis*, Mitchill), in the order named. The fish caught are estimated to be worth annually $1,000,000. They are collected in fishing tugs and distributed by rail throughout the United States and Canada.

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(W. P. A.)

ERIE, a city, a port of entry, and the county-seat of Erie county, Pennsylvania, U.S.A., on Lake Erie, 148 m. by rail N. of Pittsburg and near the N.W. corner of the state. Pop. (1890) 40,634; (1900) 52,733, of whom 11,957 were foreign-born, including 5226 from Germany and 1468 from Ireland, and 26,797 were of foreign parentage (both parents foreign-born), including 13,316 of German parentage and 4203 of Irish parentage; (1910 census) 66,525. Erie is served by the New York, Chicago & St

Louis, the Lake Shore & Michigan Southern, the Erie & Pittsburg (Pennsylvania Company), the Philadelphia & Erie (Pennsylvania railway), and the Bessemer & Lake Erie railways, and by steamboat lines to many important lake ports. The city extends over an area of about 7 sq. m., which for the most part is quite level and is from 50 to 175 ft. above the lake. Erie has a fine harbour about 4 m. in length, more than 1 m. in width, and with an average depth of about 20 ft.; it is nearly enclosed by Presque Isle, a long narrow strip of land of about 3000 acres from 300 ft. to 1 m. in width, and the national government has protected its entrance and deepened its channel by constructing two long breakwaters. Most of the streets of the city are 60 ft. wide—a few are 100 ft.—and nearly all intersect at right angles; they are paved with brick and asphalt, and many in the residential quarters are shaded with fine elms and maples. The city has four parks, in one of which is a soldiers' and sailors' monument of granite and bronze, and not far away, along the shore of lake and bay, are several attractive summer resorts. Among Erie's more prominent buildings are the United States government building, the city hall, the public library, and the county court house. The city's charitable institutions consist of two general hospitals, each of which has a training school for nurses; a municipal hospital, an orphan asylum, a home for the friendless, two old folks' homes, and a bureau of charities; here, also, on a bluff, within a large enclosure and overlooking both lake and city, is the state soldiers' and sailors' home, and near by is a monument erected to the memory of General Anthony Wayne, who died here on the 15th of December 1796.

Erie is the commercial centre of a large and rich grape-growing and agricultural district, has an extensive trade with the lake ports and by rail (chiefly in coal, iron ore, lumber and grain), and is an important manufacturing centre, among its products being iron, engines, boilers, brass castings, stoves, car heaters, flour, malt liquors, lumber, planing mill products, cooperage products, paper and wood pulp, cigars and other tobacco goods, gas meters, rubber goods, pipe organs, pianos and chemicals. In 1905 the city's factory products were valued at $19,911,567, the value of foundry and machine-shop products being $6,723,819, of flour and grist-mill products $1,444,450, and of malt liquors $882,493. The municipality owns and operates its water-works.

On the site of Erie the French erected Fort Presque Isle in 1753, and about it founded a village of a few hundred inhabitants. George Washington, on behalf of the governor of Virginia, came in the same year to Fort Le Bœuf (on the site of the present Waterford), 20 m. distant, to protest against the French fortifying this section of country. The protest, however, was unheeded. The village was abandoned in or before 1758, owing probably to an epidemic of smallpox, and the fort was abandoned in 1759. It was occupied by the British in 1760, but on the 22nd of June 1763 this was one of the several forts captured by the Indians during the Conspiracy of Pontiac. In 1764 the British regained nominal control and retained it until 1785, when it passed into the possession of the United States. The place was laid out as a town in 1795; in 1800 it became the county-seat of the newly-erected county of Erie; it was incorporated as a borough in 1805, the charter of that year being revised in 1833; and in 1851 it was incorporated as a city. At Erie were built within less than six months most of the vessels with which Commodore Oliver H. Perry won his naval victory over the British off Put-in-Bay on the 10th of September 1813.

ERIGENA, JOHANNES SCOTUS (*c.* 800-*c.* 877), medieval philosopher and theologian. His real name was Johannes Scotus (Scottus) or John the Scot. The combination Johannes Scotus Erigena has not been traced earlier than Ussher and Gale; even Gale uses it only in the heading of the version of St Maximus. The date of Erigena's birth is very uncertain, and there is no evidence to show definitely where he was born. The name Scotus, which has often been taken to imply Scottish origin, really favours the theory that he was an Irishman according to the then usage of *Scotus* or *Scotigena*. Prudentius, bishop of Troyes, definitely states that he was of Irish extraction. The pseudonym commonly read Erigena, used by himself in the titles of his versions of Dionysius the Areopagite, is *Ierugena* (in later MSS. Erugena and Eriugena), formed apparently on the analogy of *Graiugena* ("Greek-born"), which he applies to St Maximus. There seems no reason to doubt that Eriugena is connected with Erin, the name for Ireland, and Ierugena suggests the Greek ἱερός, ἱερὸς, νῆσος being a common name for Ireland. On the other hand, William of Malmesbury prefers to read Heruligena, which would make Scotus a Pannonian, while Bale says he was born at St David's, Dempster connects him with Ayr, and Gale with Eriuven in Hereford. Some early writers thought there were two persons, John Scotus and John Erigena.

Of Erigena's early life nothing is known. Bale quotes the story that he travelled in Greece, Italy and Gaul, and studied not only Greek, but also Arabic and Chaldaean. Since, however, Bale describes him as "ex patricio genitore natus," it is a reasonable inference (so R.L. Poole) that Bale confused him with one John, the son of Patricius, a Spaniard, who tells much the same story of his own travels. The knowledge of Greek displayed in Erigena's works is not such as to compel us to conclude that he had actually visited Greece. That he had a competent acquaintance with Greek is manifest from his translations of Dionysius the Areopagite and of Maximus, from the manner in which he refers to Aristotle, and from his evident familiarity with Neoplatonist writers and the fathers of the early church. Roger Bacon, in his severe criticism on the ignorance of Greek displayed by the most eminent

scholastic writers, expressly exempts Erigena, and ascribes to him a knowledge of Aristotle in the original.

Among other legends which have at various times been attached to Erigena are that he was invited to France by Charlemagne, and that he was one of the founders of the university of Paris. The only portion of Erigena's life as to which we possess accurate information was that spent at the court of Charles the Bald. Charles invited him to France soon after his accession to the throne, probably in the year 843, and placed him at the head of the court school (*schola palatina*). The reputation of this school seems to have increased greatly under Erigena's leadership, and the philosopher himself was treated with indulgence by the king. William of Malmesbury's amusing story illustrates both the character of Scotus and the position he occupied at the French court. The king having asked, "Quid distat inter sottum et Scottum?" Erigena replied, "Mensa tantum."

The first of the works known to have been written by Erigena during this period was a treatise on the eucharist, which has not come down to us (by some it has been identified with a treatise by Ratramnus, *De corpore et sanguine Domini*). In it he seems to have advanced the doctrine that the eucharist was merely symbolical or commemorative, an opinion for which Berengarius was at a later date censured and condemned. As a part of his penance Berengarius is said to have been compelled to burn publicly Erigena's treatise. So far as we can learn, however, Erigena's orthodoxy was not at the time suspected, and a few years later he was selected by Hincmar, archbishop of Reims, to defend the doctrine of liberty of will against the extreme predestinarianism of the monk Gottschalk (Gotteschalchus). The treatise *De divina praedestinatione*, composed on this occasion, has been preserved, and from its general tenor one cannot be surprised that the author's orthodoxy was at once and vehemently suspected. Erigena argues the question entirely on speculative grounds, and starts with the bold affirmation that philosophy and religion are fundamentally one and the same —"Conficitur inde veram esse philosophiam veram religionem, conversimque veram religionem esse veram philosophiam." Even more significant is his handling of authority and reason, to which we shall presently refer. The work was warmly assailed by Drepanius Florus, canon of Lyons, and Prudentius, and was condemned by two councils—that of Valence in 855, and that of Langres in 859. By the former council his arguments were described as *Pultes Scotorum* ("Scots porridge") and *commentum diaboli* ("an invention of the devil").

Erigena's next work was a Latin translation of Dionysius the Areopagite (see Dionysius Areopagiticus) undertaken at the request of Charles the Bald. This also has been preserved, and fragments of a commentary by Erigena on Dionysius have been discovered in MS. A translation of the Areopagite's pantheistical writings was not likely to alter the opinion already formed as to Erigena's orthodoxy. Pope Nicholas I. was offended that the work had not been submitted for approval before being given to the world, and ordered Charles to send Erigena to Rome, or at least to dismiss him from his court. There is no evidence, however, that this order was attended to.

The latter part of his life is involved in total obscurity. The story that in 882 he was invited to Oxford by Alfred the Great, that he laboured there for many years, became abbot at Malmesbury, and was stabbed to death by his pupils with their "styles," is apparently without any satisfactory foundation, and doubtless refers to some other Johannes. Erigena in all probability never left France, and Hauréau has advanced some reasons for fixing the date of his death about 877.

Erigena is the most interesting figure among the middle-age writers. The freedom of his speculation, and the boldness with which he works out his logical or dialectical system of the universe, altogether prevent us from classing him along with the scholastics properly so called. He marks, indeed, a stage of transition from the older Platonizing philosophy to the later and more rigid scholasticism. In no sense whatever can it be affirmed that with Erigena philosophy is in the service of theology. The above-quoted assertion as to the substantial identity between philosophy and religion is indeed repeated almost *totidem verbis* by many of the later scholastic writers, but its significance altogether depends upon the selection of one or other term of the identity as fundamental or primary. Now there is no possibility of mistaking Erigena's position: to him philosophy or reason is first, is primitive; authority or religion is secondary, derived. "Auctoritas siquidem ex vera ratione processit, ratio vero nequaquam ex auctoritate. Omnis enim auctoritas, quae vera ratione non approbatur, infirma videtur esse. Vera autem ratio, quum virtutibus suis rata atque immutabilis munitur, nullius auctoritatis adstipulatione roborari indiget" (*De divisione naturae*, i. 71). F.D. Maurice, the only historian of note who declines to ascribe a rationalizing tendency to Erigena, obscures the question by the manner in which he states it. He asks his readers, after weighing the evidence advanced, to determine "whether he (Erigena) used his philosophy to explain away his theology, or to bring out what he conceived to be the fullest meaning of it." These alternatives seem to be wrongly put. "Explaining away theology" is something wholly foreign to the philosophy of that age; and even if we accept the alternative that Erigena endeavours speculatively to bring out the full meaning of theology, we are by no means driven to the conclusion that he was primarily or principally a theologian. He does not start with the datum of theology as the completed body of truth, requiring only elucidation and interpretation; his fundamental thought is that of the universe, nature, τὸ πᾶν, or God, as the ultimate unity which works itself out into the rational system of the world. Man and all that concerns man are but parts of this system, and are to be explained by reference to it; for explanation or understanding of a thing is determination of its place in the universal or all. Religion or revelation is one element or factor in the divine process, a stage or phase of the ultimate rational life. The highest faculty of man, reason, *intellectus*, *intellectualis visio*, is that which is not content

with the individual or partial, but grasps the whole and thereby comprehends the parts. In this highest effort of reason, which is indeed God thinking in man, thought and being are at one, the opposition of being and thought is overcome. When Erigena starts with such propositions, it is clearly impossible to understand his position and work if we insist on regarding him as a scholastic, accepting the dogmas of the church as ultimate data, and endeavouring only to present them in due order and defend them by argument.

Erigena's great work, *De divisione naturae*, which was condemned by a council at Sens, by Honorius III. (1225), who described it as "swarming with worms of heretical perversity," and by Gregory XIII. in 1585, is arranged in five books. The form of exposition is that of dialogue; the method of reasoning is the syllogistic. The leading thoughts are the following. *Natura* is the name for the universal, the totality of all things, containing in itself being and non-being. It is the unity of which all special phenomena are manifestations. But of this nature there are four distinct classes:—(1) that which creates and is not created; (2) that which is created and creates; (3) that which is created and does not create; (4) that which neither is created nor creates. The first is God as the ground or origin of all things, the last is God as the final end or goal of all things, that into which the world of created things ultimately returns. The second and third together compose the created universe, which is the manifestation of God, God *in processu*, *Theophania*. Thus we distinguish in the divine system beginning, middle and end; but these three are in essence one—the difference is only the consequence of our finite comprehension. We are compelled to envisage this eternal process under the form of time, to apply temporal distinctions to that which is extra- or supra-temporal. The 744
universe of created things, as we have seen, is twofold:—*first*, that which is created and creates—the primordial ideas, archetypes, immutable relations, divine acts of will, according to which individual things are formed; *second*, that which is created and does not create, the world of individuals, the effects of the primordial causes, without which the causes have no true being. Created things have no individual or self-independent existence; they are only in God; and each thing is a manifestation of the divine, *theophania*, *divina apparitio*.

God alone, the uncreated creator of all, has true being. He is the true universal, all-containing and incomprehensible. The lower cannot comprehend the higher, and therefore we must say that the existence of God is above being, above essence; God is above goodness, above wisdom, above truth. No finite predicates can be applied to him; his mode of being cannot be determined by any category. True theology is negative. Nevertheless the world, as the *theophania*, the revelation of God, enables us so far to understand the divine essence. We recognize his being in the being of all things, his wisdom in their orderly arrangement, his life in their constant motion. Thus God is for us a Trinity—the Father as substance or being (οὐσία), the Son as wisdom (δύναμις), the Spirit as life (ἐνέργια). These three are realized in the universe—the Father as the system of things, the Son as the word, *i.e.* the realm of ideas, the Spirit as the life or moving force which introduces individuality and which ultimately draws back all things into the divine unity. In man, as the noblest of created things, the Trinity is seen most perfectly reflected; *intellectus* (νοῦς), *ratio* (λογος) and *sensus* (διάνοια) make up the threefold thread of his being. Not in man alone, however, but in all things, God is to be regarded as realizing himself, as becoming incarnate.

The infinite essence of God, which may indeed be described as *nihilum* (nothing) is that from which all is created, from which all proceeds or emanates. The first procession or emanation, as above indicated, is the realm of ideas in the Platonic sense, the word or wisdom of God. These ideas compose a whole or inseparable unity, but we are able in a dim way to think of them as a system logically arranged. Thus the highest idea is that of *goodness*; things are, only if they are good; being without well-being is naught. *Essence* participates in goodness—that which is good has being, and is therefore to be regarded as a species of good. *Life*, again, is a species of essence, *wisdom* a species of life, and so on, always descending from genus to species in a rigorous logical fashion.

The ideas are the eternal causes, which, under the moving influence of the spirit, manifest themselves in their effects, the individual created things. Manifestation, however, is part of the being or essence of the causes, that is to say, if we interpret the expression, God of necessity manifests himself in the world and is not without the world. Further, as the causes are eternal, timeless, so creation is eternal, timeless. The Mosaic account, then, is to be looked upon merely as a mode in which is faintly shadowed forth what is above finite comprehension. It is altogether allegorical, and requires to be interpreted. Paradise and the Fall have no local or temporal being. Man was originally sinless and without distinction of sex. Only after the introduction of sin did man lose his spiritual body, and acquire the animal nature with its distinction of sex. Woman is the impersonation of man's sensuous and fallen nature; on the final return to the divine unity, distinction of sex will vanish, and the spiritual body will be regained.

The most remarkable and at the same time the most obscure portion of the work is that in which the final return to God is handled. Naturally sin is a necessary preliminary to this redemption, and Erigena has the greatest difficulty in accounting for the fact of sin. If God is true being, then sin can have no substantive existence; it cannot be said that God knows of sin, for to God knowing and being are one. In the universe of things, *as* a universe, there can be no sin; there must be perfect harmony. Sin, in fact, results from the will of the individual who falsely represents something as good which is not so. This misdirected will is punished by finding that the objects after which it thirsts are in truth vanity and emptiness. Hell is not to be regarded as having local existence; it is the inner state of the sinful will. As the object of punishment is not the will or the individual himself, but the misdirection of the will, so the result of punishment is the final purification and redemption of all. Even the devils shall be saved. All, however, are not saved at once; the stages of the return to the final unity, corresponding to the stages in the creative process, are numerous, and are passed through slowly.

The ultimate goal is *deificatio*, *theosis* or resumption into the divine being, when the individual soul is raised to a full knowledge of God, and where knowing and being are one. After all have been restored to the divine unity, there is no further creation. The ultimate unity is that which neither is created nor creates.

EDITIONS.—There is a complete edition of Erigena's works in J.P. Migne's *Patrologiae cursus completus* (vol. cxxii.), edited by H.J. Floss (Paris, 1853). The *De divina praedestinatione* was published in Gilbert Mauguin's *Veterum auctorum qui nono saeculo de praedestinatione et gratia scripserunt opera et fragmenta* (Paris, 1650). The commentary ("Expositiones") on Dionysius' *Hierarchiae caelestes* appeared in the *Appendix ad opera edita ab A. Maio* (ed. J. Cozza, Rome, 1871). Of the *De divisione naturae*, editions have been published by Thomas Gale (Oxford, 1681); C.B. Schlüter (Münster, 1838); and in Floss's *Opera omnia*; there is a German translation by Ludwig Noack, *Johannes Scotus Erigena über die Eintheilung der Natur* (3 vols., 1874-1876). Erigena was also the author of some poems edited by L. Traube in *Monumenta Germaniae historica. Poëtae Latini aevi Carolini*, iii. (1896). A commentary on the *Opuscula sacra* of Boëtius is attributed to him and edited by E.K. Rand (1906). Monographs on Erigena's life and works are numerous; see St René Taillandier, *Scot Érigène et la philosophie scholastique* (1843); T. Christlieb, *Leben u. Lehre des Johannes Scotus Erigena* (Gotha, 1860); J.N. Huber, *Johannes Scotus Erigena* (Munich, 1861); W. Kaulich, *Das speculative System des Johannes Scotus Erigena* (Prague, 1860); A. Stöckl, *De Joh. Scoto Erigena* (1867); L. Noack, *Über Leben und Schriften des Joh. Scotus Erigena: die Wissenschaft und Bildung seiner Zeit* (Leipzig, 1876); R.L. Poole, *Medieval Thought* (1884), and article in *Dictionary of National Biography*; T. Wotschke, *Fichte und Erigena* (Halle, 1896); M. Baumgartner in Wetzer and Welte's *Kirchenlexikon*, x. (1897); Alice Gardner's *Studies in John the Scot* (1900); J. Dräseke, *Joh. Scotus Erigena und seine Gewährsmänner* (Leipzig, 1902); S.M. Deutsch in Herzog-Hauck's *Realencyklopädie für protestantische Theologie*, xviii. (1906); J.E. Sandys, *Hist. of Classical Scholarship* (1906), pp. 491-495. See also the general works on scholastic philosophy, especially Hauréau, Stöckl and Kaulich. An admirable résumé is given by F.D. Maurice, *Medieval Phil.* pp. 45-79.

(R. AD.; J. M. M.)

ERIGONE, in Greek mythology, daughter of Icarius, the hero of the Attic deme Icaria. Her father, who had been taught by Dionysus to make wine, gave some to some shepherds, who became intoxicated. Their companions, thinking they had been poisoned, killed Icarius and buried him under a tree on Mount Hymettus (or threw his body into a well). Erigone, guided by her faithful dog Maera, found his grave, and hanged herself on the tree. Dionysus sent a plague on the land, and all the maidens of Athens, in a fit of madness, hanged themselves like Erigone. Icarius, Erigone and Maera were set among the stars as Boötes (or Arcturus), Virgo and Procyon. The festival called Aeora (the "swing") was subsequently instituted to propitiate Icarius and Erigone. Various small images (in Lat. *oscilla*) were suspended on trees and swung backwards and forwards, and offerings of fruit were made (Hyginus, *Fab.* 130, *Poët. astron.* ii. 4; Apollodorus iii. 14). The story was probably intended to explain the origin of these *oscilla*, by which Dionysus, as god of trees (Dendrites), was propitiated, and the baneful influence of the dog-star averted (see also OSCILLA).

ERIN, an ancient name for Ireland. The oldest form of the word is Ériu, of which Érinn is the dative case. Ériu was itself almost certainly a contraction from a still more primitive form *Iberiu* or *Iveriu*; for when the name of the island was written in ancient Greek it appeared as Ἰουερνιά (Ivernia), and in Latin as *Iberio*, *Hiberio* or *Hibernia*, the first syllable of the word Ériu being thus represented in the classical languages by two distinct vowel sounds separated by *b* or *v*. Of the Latin variants, *Iberio* is the form found in the most ancient Irish MSS., such as the *Confession* of St Patrick, and the same saint's *Epistle to Coroticus*. Further evidence to the same effect is found in the fact that the ancient Breton and Welsh names for Ireland were Ywerddon or Iverdon. In later Gaelic literature the primitive form Ériu became the dissyllable Éire; hence the Norsemen called the island the land of Éire, *i.e.* Ireland, the latter word being originally pronounced in three syllables. (See IRELAND: *Notices of Ireland in Greek and Roman writers*.) Nothing is known as to the meaning of the word in any of its forms, and Whitley Stokes's suggestion that it may have been connected with the Sanskrit *avara*, meaning "western," is admittedly no more than conjecture. There was, indeed, a native Irish legend, worthless from the standpoint of etymology, to account for the origin of the name. According to this myth there were three kings of the Dedannans reigning in Ireland at the coming of the Milesians, named MacColl, MacKecht and MacGrena. The wife of the first was Eire, and from her the name of the country was derived. Curiously, Ireland in ancient Erse poetry was often called "Fodla" or "Bauba," and these were the wives of the other two kings in the legend.

ERINNA, Greek poet, contemporary and friend of Sappho, a native of Rhodes or the adjacent island of Telos, flourished about 600 (according to Eusebius, 350 B.C.). Although she died at the early age of nineteen, her poems were among the most famous of her time and considered to rank with those of Homer. Of her best-known poem, Ἠλακάτη (the *Distaff*), written in a mixture of Aeolic and Doric, which contained 300 hexameter lines, only 4 lines are now extant. Three epigrams in the Palatine anthology, also ascribed to her, probably belong to a later date.

The fragments have been edited (with those of Alcaeus) by J. Pellegrino (1894).

ERINYES (Lat. *Furiae*), in Greek mythology, the avenging deities, properly the angry goddesses or goddesses of the curse pronounced upon evil-doers. According to Hesiod (*Theog.* 185) they were the daughters of Earth, and sprang from the blood of the mutilated Uranus; in Aeschylus (*Eum.* 321) they are the daughters of Night, in Sophocles (*O.C.* 40) of Darkness and Earth. Sometimes one Erinys is mentioned, sometimes several; Euripides first spoke of them as three in number, to whom later Alexandrian writers gave the names Alecto (unceasing in anger), Tisiphone (avenger of murder), Megaera (jealous). Their home is the world below, whence they ascend to earth to pursue the wicked. They punish all offences against the laws of human society, such as perjury, violation of the rites of hospitality, and, above all, the murder of relations. But they are not without benevolent and beneficent attributes. When the sinner has expiated his crime they are ready to forgive. Thus, their persecution of Orestes ceases after his acquittal by the Areopagus. It is said that on this occasion they were first called Eumenides ("the kindly"), a euphemistic variant of their real name. At Athens, however, where they had a sanctuary at the foot of the Areopagus hill and a sacred grove at Colonus, their regular name was Semnae (venerable). Black sheep were sacrificed to them during the night by the light of torches. A festival was held in their honour every year, superintended by a special priesthood, at which the offerings consisted of milk and honey mixed with water, but no wine. In Aeschylus, the Erinyes are represented as awful, Gorgon-like women, wearing long black robes, with snaky locks, bloodshot eyes and claw-like nails. Later, they are winged maidens of serious aspect, in the garb of huntresses, with snakes or torches in their hair, carrying scourges, torches or sickles. The identification of Erinyes with Sanskrit Saranyu, the swift-speeding storm cloud, is rejected by modern etymologists; according to M. Bréal, the Erinyes are the personification of the formula of imprecation (ἀρά), while E. Rohde sees in them the spirits of the dead, the angry souls of murdered men.

See C.O. Müller, *Dissertations on the Eumenides of Aeschylus*, (Eng. tr., 1835); A. Rosenberg, *Die Erinyen* (1874); J.E. Harrison, *Prolegomena to the Study of Greek Religion* (1903); and *Journal of Hellenic Studies*, xix. p. 205, according to whom the Erinyes were primarily local ancestral ghosts, potent for good or evil after death, earth genii, originally conceived as embodied in the form of snakes, whose primitive haunt and sanctuary was the omphalos at Delphi; E. Rohde, *Psyche* (1903); A. Rapp in Roscher's *Lexikon der Mythologie*, and J.A. Hild in Daremberg and Saglio's *Dictionnaire des antiquités*, s.v. FURIAE.

ERIPHYLE, in Greek mythology, sister of Adrastus and wife of Amphiaraus. Having been bribed by Polyneices with the necklace of Harmonia, she persuaded her husband to take part in the expedition of the Seven against Thebes, although he knew it would prove fatal to him. Before setting out, the seer charged his sons to slay their mother as soon as they heard of his death. The attack on Thebes was repulsed, and during the flight the earth opened and swallowed up Amphiaraus together with his chariot. His son Alcmaeon, as he had been bidden, slew his mother, and was driven from place to place by the Erinyes, seeking purification and a new home (Apollodorus iii. 6. 7).

ERIS, in Greek mythology, a sister of the war-god Ares (Homer, *Iliad*, iv. 440), and in the Hesiodic theogony (225) a daughter of Night. In the later legends of the Trojan War, Eris, not having been invited to the marriage festival of Peleus and Thetis, flings a golden apple (the "apple of discord") among the guests, to be given to the most beautiful. The claims of the three deities Hera, Aphrodite and Athena are decided by Paris in favour of Aphrodite, who as a reward assists him to gain possession of Helen (Hyginus, *Fab.* 92; Lucian, *Charidemus*, 17). Hesiod also mentions (*W. and D.* 24) a beneficent Eris, the personification of honourable rivalry. In Virgil (*Aeneid*, viii. 702) and other Roman poets Eris is represented by Discordia.

ERITH, an urban district in the north-western parliamentary division of Kent, England, 14 m. E. by S. of London, on the South Eastern & Chatham railway. Pop. (1891) 13,414; (1901) 25,296. It lies on the south bank of the Thames and extends up the hills above the shore, many villas having been erected on the higher ground. The park of a former seat, Belvedere, was thus built over (*c.* 1860), and the mansion became a home for disabled seamen. The church of St John the Baptist, though largely altered by modern restoration, retains Early English to Perpendicular portions, and some early monuments and brasses. Erith has large engineering and gun factories, and in the neighbourhood are gunpowder, oil, glue and manure works. The southern outfall works of the London main drainage system are at Crossness in the neighbouring lowland called Plumstead Marshes. Erith is the headquarters of several yacht clubs. Erith, the name of which is commonly derived from A.S. *Ærra-hythe* (old haven), was anciently a borough, and was granted a market and fairs in 1313. Down to the close of the 17th century it was of some importance as a naval station.

ERITREA, an Italian colony on the African coast of the Red Sea. It extends from Ras Kasar, a cape 110 m. S. of Suakin, in 18° 2′ N., as far as Ras Dumeira (12° 42′ N.), in the Strait of Bab-el-Mandeb, a coast-line of about 650 m. The colony is bounded inland by the Anglo-Egyptian Sudan, Abyssinia and French Somaliland. It consists of the coast lands lying between the capes named and of part of the northern portion of the Abyssinian plateau. The total area is about 60,000 sq. m. The population is approximately 450,000, of which, exclusive of soldiers, not more than 3000 are whites.

The land frontier starting from Ras Kasar runs in a south-westerly direction until in about 14° 15′ N., 36° 35′ E. it reaches the river Setit, some distance above the junction of that stream with the Atbara. This, the farthest point inland, is 198 m. S.W. of Massawa. The frontier now turns east, following for a short distance the course of the river Setit; thence it strikes north-easterly to the Mareb, and from 38° E. follows that river and its tributaries the Belesa and Muna, until within 42 m. of the sea directly south of Annesley Bay. At this point the frontier turns south and east, crossing the Afar or Danakil country at a distance of 60 kilometres (37.28 m.) from the coast-line. About 12° 20′ N. the French possessions in Somaliland are reached. Here the frontier turns N.E. and so continues until the coast of the Red Sea is again reached at a point south of the town of Raheita. In the southern part of the colony are small sultanates, such as those of Aussa and Raheita, which are under Italian protection. The Dahlak archipelago and other groups of islands along the coast belong to Eritrea.

Physical Features.—The coast-line is of coral formation and is, in the neighbourhood of Massawa, thickly studded with small islands. The chief indentations are Annesley Bay, immediately south of Massawa, and Assab Bay in the south. The colony consists of two widely differing regions. The northern division is part of the Abyssinian highlands. The southern division, part of the Afar or Danakil country, includes all the territory of the colony south of Annesley Bay. These two regions are connected by a narrow strip of land behind Annesley Bay, where the Abyssinian hills approach close to the sea. From this bay the coast-line trends S.E. so that at Tajura Bay the distance between the Abyssinian hills and the sea is over 200 m. The Afar country is part of the East African rift-valley, and in the southern parts of the valley its surface is diversified by ranges of hills, frequently volcanic, and by lakes. The plains, however, extend over large areas, they are generally arid and are often covered with mimosa trees which form a kind of jungle called by the natives *khala*. The torrents which descend from the Abyssinian plateau usually fail to reach the sea. They are mostly bordered by dense vegetation; in the dry season water is found in pools in the river beds or can be obtained by digging. The principal rivers enter and are lost in one or other of two salt plains or basins, that of Asali in the north and that of Aussa in the south. The Hawash flows through the Aussa country in a N.E. direction, but is lost in lakes Abbebad and Aussa (see Abyssinia). The Raguali and other rivers drain into the Asali basin. This basin, like that of Aussa, is in places 200 ft. below sea-level. On the west the Asali basin reaches to the Abyssinian foot-hills; in its southern part is the small lake Alelbad. The eastern edge of the basin is formed by a ridge of gypsum and on its margin grow palms. In parts the salt lies thick on the plain, which then has the appearance of a lake frozen over. South of Lake Alelbad is a volcano called Artali or Erta-alé (“the smoky”), and farther to the S.E., in about 13° 15′ N., is the peak of Afdera, which was in eruption in June 1907. The hills, 1000 to 4000 ft. in height, which run more or less parallel to and a few miles from the coast, include the volcano of Dubbi (reported active in 1861), some 30 m. S. of the port of Edd (Eddi). In 14° 52′ N., 39° 53′ E. and near the northern end of the zone of depression the volcano of Alid (2985 ft.) rises from the trough. Its chief crest forms an elongated ring and encloses a crater over half a mile in diameter and with walls 350 ft. high. North and south of Alid extends a vast lava field. Dubbi and Alid are in Italian territory; the greater part of Afar belongs to Abyssinia.

At Annesley Bay the narrow coast plain is succeeded by foothills separated by small valleys through which flow innumerable streams. From these hills the ascent to the plateau which constitutes northern Eritrea is very steep. This tableland, which has a general elevation of about 6500 ft., is fairly

fertile despite a desert region—Sheb—to the S.E. of Keren. It is characterized by rich, well-watered valleys, verdant plains and flat-topped hills with steep sides, running in ranges or isolated. The highest hills in Eritrean territory rise to about 10,000 ft. The plateau is known by various names, the region directly west of Massawa being called Hamasen. To the west and north the plateau sinks in terraces to the plains of the Sudan, and eastward falls more abruptly to the Red Sea, the coast plain, known as the Samhar, consisting of sandy country covered with mimosa and, along the khors, with a somewhat richer vegetation.

The colony contains no navigable streams. For a short distance the Setit (known in its upper course as the Takazze), a tributary of the Atbara, forms the frontier, as does also in its upper course the Gash or Mareb (see ABYSSINIA). The Mareb, often dry in summer, in the floods is a large and impassable river. Both the Setit and Mareb have a general westerly course across the Abyssinian plateau. The Baraka (otherwise Barka) and Anseba rise in the Hamasen plateau near Asmara within a short distance of each other. The Baraka flows west and then north; the Anseba, which has a more easterly course, also flows northward and joins the Baraka a little N. of 17° N. A few miles below the confluence the Baraka leaves Italian territory. It is (as is the Anseba) an intermittent stream. After heavy rain it discharges some of its water into the Red Sea north of Tokar. The whole of the hill country north of Asmara belongs to the drainage area of the Baraka or Anseba. Of the numerous streams which, north of the Danakil country, run direct from the hills to the Red Sea, the Hadas may be mentioned, as along the valley of that stream is one of the most frequented routes to the tableland. The Hadas, in time of flood, reaches the ocean near Adulis in Annesley Bay.

Climate.—The climate in different parts of the colony varies greatly. Three distinct climatic zones are found:—(1) that of the coastlands, including altitudes up to 1650 ft., (2) that of the escarpments and valleys, and (3) that of the high plateau and alpine summits. In the coast zone the heat and humidity are excessive during most of the year, June, September and October being the hottest months. Rains occur between November and April, during which time the temperature is lower. In this zone malarial fevers prevail in winter. The heat is greatest at Massawa, where the mean temperature averages 88° F., but where, in summer, the thermometer often rises to 120° F. in the shade. In the second zone the climate is more temperate and there is considerable variation in temperature owing to nocturnal radiation. This zone falls within the régime of the summer monsoon rains, while those districts adjoining the coast zone enjoy also winter rains. August is the most rainy and May the hottest month. On the high plateau, *i.e.* the third zone, the climate is generally moderately cool. Slight rain falls in the spring and abundant monsoon rains from June to September. The heat is greatest in the dry season, November to April. Above 8500 ft. the climate becomes sub-alpine in character.

Flora and Fauna.—In the low country the flora differs little from that of tropical Africa generally, whilst on the plateau the vegetation is characteristic of the temperate zone. The olive tree grows on the high plateau and covers the flanks of the hills to within 3000 ft. of sea-level. The sycamore-fig tree grows to enormous proportions in parts of the plateau. Lower down durra, maize and bultuc grow in profusion. In the northern part of the colony, especially along the Khor Baraka, the dom palm flourishes. The fauna includes, in the low country, the lion, panther, elephant, camel, and antelope of numerous species. On the plateau the fauna is that of Abyssinia (*q.v.*).

Inhabitants.—The inhabitants of the plains and foothills are for the most part semi-nomad shepherds, living on durra and milk. In the north these people are largely of Arab or Hamitic stock, such as the Beni-Amer, but include various negro tribes. Afar and Somali form the population of the southern regions. The inhabitants of the plateau are Abyssinians. The nomads are Mussulmans and are, as a rule, docile and pacific, though the Danakils are given to occasional raiding. The Abyssinians are more warlike, but they have settled down under Italian rule. Among the native industries are mat-weaving, cotton-weaving, silver-working and rudimentary iron and leather working. (See AFARS; SOMALILAND and ABYSSINIA.)

Towns.—The principal places on the coast are Massawa (*q.v.*), pop. about 10,000, the chief seaport of the colony, Assab, chief town of the Danakil region, to which converges the trade from Abyssinia across the Aussa country, and Zula (*q.v.*), identified with the ancient Adulis. The chief town in the interior is Asmara (*q.v.*), the capital of the colony and under the Abyssinians capital of the province of Hamasen, and favourite headquarters of Ras Alula (see below and also ABYSSINIA). It is situated 7800 ft. above the sea, and has something of the aspect of a European town. Keren, 50 m. N.W. of Asmara, is the centre for a district (Bogos) fertilized by the upper course of the Anseba; Agordat, on the river Baraka, on the road from Keren to Kassala, is the centre of the Beni-Amer, Algheden and Sabderat tribes; Mogolo, on the lower Mareb, is the rendezvous of the Baria and Baza tribes. Towards Abyssinia the chief towns are Saganeiti (capital of the Okulé-Kusai province), Godofelassi and Adi-Ugri, the two latter situated in the fertile plain of the Seraé; Adiquala, on the edge of the Mareb gorge; and Arrasa, the centre of the districts constituting the province of Deki-Tesfa.

Agriculture and Trade.—The nomads of the plains possess large herds of cattle and camels. The low country is almost entirely pastoral and unsuited for the cultivation of crops. On the other hand almost all European cereals flourish in the intermediate zone and on the high plateau, and the Abyssinian is a good agriculturist and understands irrigation. Numbers of emigrants from Italy possess farms on the plateau. Experiments in the cultivation of coffee, tobacco and cotton have given good results in the intermediate zone. Besides camels and oxen, sheep and goats are numerous, and meat, hides and butter are articles of local trade. Hides are the principal export (about £50,000 a year). Wax, gum, coffee and ivory are also exported. Pearl fishing is carried on at Massawa and the Dahlak islands. The annual value of the fisheries is about £40,000 (pearls £10,000, mother of pearl £30,000). Gold mines are worked near Asmara. Salt, obtained from the salt lakes in the Aussa and Danakil countries, is a

valuable article of commerce. Cotton goods are the chief imports. There is a little trade with northern Abyssinia, but it is undeveloped. For the five years 1901-1905 the average value of the external trade was £456,000 per annum. The imports more than doubled the exports.

Communications.—A railway, 65 m. long, connects Massawa with Asmara. An extension of the line is planned from Asmara to Sabderat and Kassala. The whole territory is crossed by camel and mule paths between the sea and the high plateau, and between the various centres of population. Every valley that brings water to the Red Sea has a route leading to the high plateau. The great arteries, however, number three, which, starting from Massawa by way of Asmara, run, two to Abyssinia, and one to Kassala and Khartum. They are all more or less practicable for carts, and are flanked by a good telegraph line as long as they lie in Italian territory. There are also two caravan routes from Assab Bay, across the Danakil country to southern Abyssinia. The northern leads by a comparatively easy ascent to Yejju, the more southern follows the valley of the Hawash. A telegraph line 500 m. long connects Massawa with Adis Ababa via Asmara. Massawa is also telegraphically connected with the outside world by a cable to Perim via Assab. There is regular steamship communication with Italy.

Administration.—Eritrea is administered by a civil governor responsible to the ministry of foreign affairs at Rome. It is divided into six provinces, each governed by a regional commissioner. Some tracts of frontier territory are detached from the various regions and entrusted to political residents, as, for instance, on the Sudan frontier and also on the Abyssinian boundary, where strict surveillance is necessary to repress raiding incursions from Tigré, and where the chief intelligence department is established. The six regions or principal provinces are:—Asmara, which includes Hamasen and other small districts; Keren, which comprises the high territories to the north of Asmara, *i.e.* the Bogos country; Massawa, extending over all the tribes between the high plateau and the sea from the Hababs to the Danakil; Assab, which extends from Edd to Raheita; Okulé-Kusai, the plateau country S.E. of Asmara; Seraé, including Deki-Tesfa, the country S.W. of Asmara. The regional commissioners and the political residents act either by means of the village headmen (*Shum* or *Chicca*), by the chiefs of districts in the few localities where villages are still organized in districts, or by the headmen of tribes, and by the councils of the elders wherever these remain.

Revenue is derived from customs duties, direct taxation and tribute paid by the nomad tribes. The local revenue, which for the period 1897-1907 was about £100,000 a year, is supplemented by grants from Italy, the total cost of the administration being about £400,000 yearly. Nearly half the expenditure is on the military force maintained.

Justice.—Civil justice for natives is administered, in the first instance, by the headmen of villages, provinces, tribes, or by councils of notables (*Shumagalle*); in appeal, by the residents and regional tribunals, and, in the last instance, by the colonial court of appeal. Europeans are entirely under Italian jurisdiction. Penal justice is administered by Italian judges only. An administrative tribunal settles, without appeal, questions of tribute, disputes concerning family, village or tribal landmarks, as well as suits involving the colonial government. The civil laws for the natives are those established by local usage. Europeans are answerable to the Italian civil code. Penal laws are the same as in Italy, except where modified by local usages. Appeal to the Rome court of cassation is admitted against all penal and civil sentences.

Defence.—Defence is entrusted to a corps of colonial troops, partly Italian and partly native; to a militia (*milizia mobile*) formed by natives who have already served in the colonial corps; and to the *chitet* or general levy which, in time of war, places all male able-bodied inhabitants under arms. The regional commissioners and political residents have at their disposal some hundreds of irregular paid soldiers under native chiefs. In war time these irregulars form part of the colonial corps, but in time of peace serve as frontier police. The colonial corps, about 5000 strong, garrisons the chief places of strategic importance, such as Asmara, Keren and Saganeiti. The irregular troops, on foot, or mounted on camels, number about 1000 men. The militia consists of 3500 men of all arms, and is intended in time of war to reinforce the various divisions of the colonial corps. The *chitet* yields between 3000 and 4000 men, to be employed on the lines of communication or in caravan service. All these troops are intended to ward off a first attack, so as to allow time for the arrival of reinforcements from Italy. The customs and political surveillance along the coast is entrusted, afloat, to the Massawa naval station, and, ashore, to a coastguard company 400 strong stationed at Meder, with detachments at Assab, Massawa, Raheita, Edd and Taclai.

History.—Traces of the ancient Eritrean civilization are scarce. During the prosperous periods of ancient Egypt, Egyptian squadrons asserted their rule over the west Red Sea coast, and under the Ptolemies the port of Golden Berenice (Adulis?) was an Egyptian fortress, afterwards abandoned. During the early years of the Roman empire, Eritrea formed part of an important independent state—that of the Axumites (Assamites). At the end of the reign of Nero, and perhaps even earlier, the king of the Axumites ruled over the Red Sea coast from Suakin to the strait of Bab-el-Mandeb, and traded constantly with Egypt. This potentate called himself “king of kings,” commanded an army and a fleet, coined money, adopted Greek as the official language, and lived on good terms with the Roman empire. The Axumites belonged originally to the Hamitic race, but the immigration of the Himyaritic tribes of southern Arabia speedily imposed a new language and civilization. Therefore the ancient Abyssinian language, Geez, and its living dialects, Amharic and Tigrina, are Semitic, although modified by the influence of the old Hamitic Agau or Agao. Adulis (Adovlis), slightly to the north of Zula (*q.v.*), was the chief Axumite port. From Adulis started the main road, which led across the high plateau to the capital Axomis (Axum). Along the road are still to be seen vestiges of cities and inscribed monuments, such as the Himyaritic inscriptions on the high plateau of Kohait, the six obelisks with a Saban inscription at Toconda, and an obelisk with an inscription at Amba Sait. Other

monuments exist elsewhere, as well as coins of the Axumite period with Greek and Ethiopian inscriptions. After the rise of the Ethiopian empire the history of Eritrea is bound up with that of Ethiopia, but not so entirely as to be completely fused. The documents of the Portuguese expedition of the 16th century and other Ethiopian records show that all the country north of the Mareb enjoyed relative autonomy under a vassal of the Ethiopian emperor.

Michael, counsellor of Solomon, who was king of the country north of the Mareb, usurped the throne of Solomon during the reign of the Emperor Atzié Jasu II. (1729-1753), and, after proclaiming himself ras of Tigré and "protector of the empire," ceded the North Mareb country to an enemy of the rightful dynasty. Hence a long struggle between the dispossessed family and the occupants of the North Mareb throne. The coast regions had meantime passed from the control of the Abyssinians. In the 16th century the Turks made themselves masters of Zula, Massawa, &c., and these places were never recovered by the Abyssinians. In 1865 Massawa and the neighbouring coast was acquired by Egypt, the khedive Ismail entertaining projects for connecting the port by railway with the Nile. The Egyptians took advantage of civil war in Abyssinia to seize Keren and the Bogos country in 1872[1], an action against which the negus Johannes (King John), newly come to the throne, did not at the time protest. In 1875 and 1876 the Egyptians, who sought to increase their conquests, were defeated by the Abyssinians at Gundet and Gura. Walad Michael, the hereditary ruler of Bogos, fought as ally of King John at Gundet and of the Egyptians at Gura. For two years Walad Michael continued to harass the border, but in December 1878 he submitted to King John, by whose orders he was (Sept. 1879) imprisoned upon an amba, or flat-topped mountain, whence he only succeeded in escaping in 1890. In 1879 his territory was given by King John to Ras Alula, who retained it until, in August 1889, the Italians occupied Asmara (see Abyssinia: *History*).

An Egyptian garrison remained at Keren in the Bogos country until 1884, when in consequence of the revolt of the Mahdi it was withdrawn, Bogos being occupied by Abyssinia on the 12th of September of that year. On the 5th of February 1885 an Italian force, with the approval of Great Britain, occupied Massawa, the Egyptian garrison returning to Egypt. This occupation led to wars with Abyssinia and finally to the establishment of the colony in its present limits. The history of the Italian-Abyssinian relations is fully told in the articles Italy and Abyssinia (history sections).

It was not, however, at Massawa that Italy first obtained a foothold in eastern Africa. The completion of the Suez Canal led Italy as well as Great Britain and France to seek territorial rights on the Red Sea coasts. The purchase of Assab and the neighbouring region for £1880, from the sultan Berehan of Raheita for use as a coaling station by the Italian Rubattino Steamship Company, in March 1870, formed the nucleus of Italy's colonial possessions. This purchase was protested against by Egypt, Turkey and Great Britain; the last named power being willing to recognize an Italian commercial settlement, but nothing more. (The Indian government viewed the establishment of the Italians on the new highway to the East with a good deal of ill-humour.) Eventually, the British opposition being overcome and that of Egypt and Turkey disregarded, Assab, by a decree of the 5th of July 1882, was declared an Italian colony. Between 1883 and 1888 various treaties were concluded with the sultan of Aussa ceding the Danakil coast to Italy and recognizing an Italian protectorate over the whole of his country—through which passes the trade route from Assab Bay to Shoa.

On the 1st of January 1890 the various Italian possessions on the coast of the Red Sea were united by royal decree into one province under the title of the Colony of Eritrea—so named after the Erythraeum Mare of the Romans. At first the government of the colony was purely military, but after the defeat of the Italians by the Abyssinians at Adowa, the administration was placed upon a civil basis (1898-1900). The frontiers were further defined by a French-Italian convention (24th of January 1900) fixing the frontier between French Somaliland and the Italian possessions at Raheita, and also by various agreements with Great Britain and Abyssinia. A tripartite agreement between Italy, Abyssinia and Great Britain, dated the 15th of May 1902, placed the territory of the Kanama tribe, on the north bank of the Setit, within Eritrea. A convention of the 16th of May 1908 settled the Abyssinian-Eritrean frontier in the Afar country, the boundary being fixed at 60 kilometres from the coast. The task of reconstructing the administration on a civil basis and of developing the commerce of the colony was entrusted to Signor F. Martini, who was governor for nine years (1898-1906). Under civil rule the colony made steady though somewhat slow progress.

Authorities.—See B. Melli, *La Colonia Eritrea dalle sue origini al anno 1901* (Parma, 1901); G.B. Penne, *Per l'Italia Africana. Studio critico* (Rome, 1906); R. Perini, *Di qua dal Marèb* (Florence, 1905), a monograph on the Asmara zone; F. Martini, *Nell' Africa Italiana* (3rd ed., Milan, 1891); A.B. Wylde, *Modern Abyssinia*, chaps. v.-ix. (London, 1901); E.D. Schoenfeld, *Erythräa und der ägyptische Sudân*, chaps. i.-xii. (Berlin, 1904); Luigi Chiala, *La Spedizione di Massana* (Turin, 1888); *Abyssinian Green Books* published at intervals in 1895 and 1896, covering the period from 1870 to the end of the Italo-Abyssinian War; Vico Mantegazza, *La Guerra in Africa* (Florence, 1896); General Baratieri, *Memorie d'Africa* (Rome, 1898); C. de la Jonquière, *Les Italiens en Érythrée* (Paris, 1897); G.F.H. Berkeley, *The Campaign of Adowa* (London, 1902). For orography and geology see an article by P. Verri in *Boll. Soc. geog. italiana,* 1909, and for climate an article in *Rivista coloniale* (1906), by A. Tancredi. A. Allori compiled a *Piccolo Dizionario eritreo, italiano-arabo-amarico* (Milan, 1895).

For Afar consult W. Munzinger, "A Journey through the Afar Country" in *Journ. Royal Geog. Soc.* for 1869; V. Bottego, "Nella Terra dei Danakil," in *Boll. Soc. Geog. Italiana*, 1892; Count C. Rossini, "Al Rágali" in *L'Espl. Comm.* of Milan, 1903-1904; and articles by G. Dainelli and O. Marinelli in the *Riv. Geog. Italiana* of Florence for 1906-1908, dealing with the volcanic regions.

Bibliographies will be found in G. Fumagalli's *Bibliografia Etiopica* (Milan, 1893) and in the *Riv. Geog. Italiana* for 1907.

1 During the Second Empire unsuccessful efforts were made by France to obtain a Red Sea port and a foothold in northern Abyssinia. (See SOMALILAND: *French*.)

ERIVAN, a government of Russia, Transcaucasia, having the province of Kars on the W., the government of Tiflis on the N., that of Elisavetpol on the N. and E., and Persia and Turkish Armenia on the S. It occupies the top of an immense plateau (6000-8000 ft.). Continuous chains of mountains are met with only on its borders, and in the E., but the whole surface is thickly set with short ridges and isolated mountains of volcanic origin, of which Alagöz (14,440 ft.) and Ararat (16,925 ft.) are the most conspicuous and the most important. Both must have been active in Tertiary times. Lake Gokcha (540 sq. m.) is encircled by such volcanoes, and the neighbourhood of Alexandropol is a "volcanic amphitheatre," being entirely buried under volcanic deposits. The same is true of the slopes leading down to the river Aras; and the valley of the upper Aras is a stony desert, watered only by irrigation, which is carried on with great difficulty owing to the character of the soil. The government is drained by the Aras, which forms the boundary with Persia and flows with great velocity down its stony bed, the fall being 17-22 ft. per mile in its upper course, and 9 ft. at Ordubad, where it quits the government, while lower down it again increases to 23 ft. Many of the small lakes, filling volcanic craters, are of great depth. Timber is very scarce. A variety of useful minerals exists, but only rock-salt is obtained, at Nakhichevan and Kulp. The climate is extremely varied, the following being the average temperatures and mean annual rainfall at Alexandropol (alt. 5078 ft.) and Aralykh (2755 ft.) respectively: year 42°, January 12°, July 65°, mean rainfall 16.2 in.; and year 53°, January 20.5°, July 79°, rainfall 6.3 in. The population numbered 829,578 in 1897 (only 375,086 women), of whom 82,278 lived in the towns. An estimate in 1906 gave a total of 909,100. They consist chiefly of Armenians (441,000), Tatars (40%), Kurds (49,389), with Russians, Greeks and Tates. Most of the Armenians belong to the Gregorian (Christian) Church, and only 4020 to the Armenian Catholic Church. The Tatars are mostly Shiite Mussulmans, only 27,596 being Sunnites; 7772 belong to the peculiar faith of the Yezids. While barley only can be grown on the high parts of the plateau, cotton, mulberry, vines and all sorts of fruit are cultivated in the valley of the Aras. Cattle-breeding is extensively carried on; camels also are bred, and leeches are collected out of the swamps and exported to Persia. Industry is in its infancy, but cottons, carpets, and felt goods are made in the villages. A considerable trade is carried on with Persia, but trade with Asia Minor is declining. The government is divided into seven districts—Erivan, Alexandropol, Echmiadzin (chief town, Vagarshapat), Nakhichevan, Novobayazet, Surmali (chief town, Igdyr), and Sharur-daralagöz (chief town, Norashen). The principal towns are Erivan (see below), Alexandropol (32,018 inhabitants in 1897), Novobayazet (8507), Nakhichevan (8845), and Vagarshapat (3400).

ERIVAN, or IRWAN, in Persian, *Rewan*, a town of Russia, capital of the government of the same name, situated in 40° 14′ N., 44° 38′ E., 234 m. by rail S.S.W. of Tiflis, on the Zanga river, from which a great number of irrigation canals are drawn. Altitude, 3170 ft. Pop. (1873) 11,938; (1897) 29,033. The old Persian portion of the town consists mainly of narrow crooked lanes enclosed by mud walls, which effectually conceal the houses, and the modern Russian portion is laid out in long ill-paved streets. On a steep rock, rising about 600 ft. above the river, stand the ruins of the 16th-century Turkish fortress, containing part of the palace of the former Persian governors, a handsome but greatly dilapidated mosque, a modern Greek church and a cannon foundry. One chamber, called the Hall of the Sardar, bears witness to former splendour in its decorations. The finest building in the city is the mosque of Hussein Ali Khan, familiarly known as the Blue Mosque from the colour of the enamelled tiles with which it is richly encased. At the mosque of Zal Khan a passion play is performed yearly illustrative of the assassination of Hussein, the son of Ali. Erivan is an Armenian episcopal see, and has a theological seminary. The only manufactures are a little cotton cloth, leather, earthenware and blacksmiths' work. The fruits of the district are noted for their excellence—especially the grapes, apples, apricots and melons. Armenians, Persians and Tatars are the principal elements in the population, besides some Russians and Greeks. The town fell into the power of the Turks in 1582, was taken by the Persians under Shah Abbas in 1604, besieged by the Turks for four months in 1615, and reconquered by the Persians under Nadir Shah in the 18th century. In 1780 it was successfully defended against Heraclius, prince of Georgia; and in 1804 it resisted the Russians. At length in 1827 Paskevich took the fortress by storm, and in the following year the town and government were ceded to Russia by the peace of Turkman-chai. A Tatar poem in celebration of the event has been preserved by the Austrian poet, Bodenstedt, in his *Tausend und ein Tage im Orient* (1850).

ERLANGEN, a town of Germany, in the kingdom of Bavaria, on a fertile plain, at the confluence of the Schwabach and the Regnitz, 11 m. N.W. of Nuremberg, on the railway from Munich to Bamberg. Pop. (1905) 23,720. It is divided into an old and a new town, the latter consisting of wide, straight and well-built streets. The market place is a fine square. Upon it stand the town-hall and the former palace of the margraves of Bayreuth, now the main building of the university. The latter was founded by the margrave Frederick (d. 1763), who, in 1742, established a university at Bayreuth, but in 1743 removed it to Erlangen. A statue of the founder, erected in 1843 by King Louis I. of Bavaria, stands in the centre of the square and faces the university buildings. The university has faculties of philosophy, law, medicine and Protestant theology. Connected with it are a library of over 200,000 volumes, geological, anatomical and mineralogical institutions, a hospital, several clinical establishments, laboratories and a botanical garden. Among the churches of the town (six Protestant and one Roman Catholic), only the new town church, with a spire 220 ft. high, is remarkable. The chief industries of Erlangen are spinning and weaving, and the manufacture of glass, paper, brushes and gloves. The brewing industry is also important, the beer of Erlangen being famous throughout Germany and large quantities being exported.

Erlangen owes the foundation of its prosperity chiefly to the French Protestant refugees who settled here on the revocation of the edict of Nantes and introduced various manufactures. In 1017 the place was transferred from the bishopric of Würzburg to that of Bamberg; in 1361 it was sold to the king of Bohemia. It became a town in 1398 and passed into the hands of the Hohenzollerns, burgraves of Nuremberg, in 1416. There for nearly three centuries it was the property of the margraves of Bayreuth, being ceded with the rest of Bayreuth to Prussia in 1791. In 1810 it came into the possession of Bavaria. Erlangen was for many years the residence of the poet Friedrich Rückert, and of the philosophers Johann Gottlieb Fichte and Friedrich Wilhelm von Schnelling.

See Stein and Müller, *Die Geschichte von Erlangen* (1898).

ERLE, SIR WILLIAM (1793-1880), English lawyer and judge, was born at Fifehead-Magdalen, Dorset, on the 1st of October 1793, and was educated at Winchester and at New College, Oxford. Having been called to the bar at the Middle Temple in 1819 he went the western circuit, became counsel to the Bank of England, sat in parliament from 1837 to 1841 for the city of Oxford, and, although of opposite politics to Lord Lyndhurst, was made by him a judge of the common pleas in 1845. He was transferred to the queen's bench in the following year, and in 1859 came back to the common pleas as chief justice upon the promotion of Sir Alexander Cockburn. He retired in 1866, receiving the highest eulogiums for the ability and impartiality with which he had discharged the judicial office. He died at his estate at Bramshott, Hampshire, on the 28th of January 1880, and a monument without his name but in his memory (sometimes erroneously supposed to mark the place where an old gibbet was) stands on the top of Hindhead.

See E. Manson, *Builders of our Law* (1904).

ERLKÖNIG, or ERL-KING, a mythical character in modern German literature, represented as a gigantic bearded man with a golden crown and trailing garments, who carries children away to that undiscovered country where he himself abides. There is no such personage in ancient German mythology, and the name is linguistically nothing more than the perpetuation of a blunder. It first appeared in Herder's *Stimmen der Völker* (1778), where it is used in the translation of the Danish song of the *Elf-King's Daughter* as equivalent to the Danish *ellerkonge*, or *ellekonge*, that is, *elverkonge*, the king of the elves; and the true German word would have been *Elbkönig* or *Elbenkönig*, afterwards used under the modified form of *Elfenkönig* by Wieland in his *Oberon* (1780). Herder was probably misled by the fact that the Danish word *elle* signifies not only elf, but also alder tree (Ger. *Erle*). His mistake at any rate has been perpetuated by both English and French translators, who speak of a "king of the alders," "un roi des aunes," and find an explanation of the myth in the tree-worship of early times, or in the vapoury emanations that hang like weird phantoms round the alder trees at night. The legend was adopted by Goethe as the subject of one of his finest ballads, rendered familiar to English readers by the translations of Lewis and Sir Walter Scott; and since then it has been treated as a musical theme by Reichardt and Schubert.

ERMAN, PAUL (1764-1851), German physicist, was born in Berlin on the 29th of February 1764. He was the son of the historian Jean Pierre Erman (1735-1814), author of *Histoire des réfugiés*. He became teacher of science successively at the French gymnasium in Berlin, and at the military academy, and on the foundation of the university of Berlin in 1810 he was chosen professor of physics. He died at Berlin on the 11th of October 1851. His work was mainly concerned with electricity and magnetism, though he also made some contributions to optics and physiology. His son, Georg Adolf Erman (1806-1877), was born in Berlin on the 12th of May 1806, and after studying natural science at Berlin and Königsberg, spent from 1828 to 1830 in a journey round the world, an account of which he published in *Reise um die Erde durch Nordasien und die beiden Ozeane* (1833-1848). The magnetic observations he made during his travels were utilized by C.F. Gauss in his theory of terrestrial magnetism. He was appointed professor of physics at Berlin in 1839, and died there on the 12th of July 1877. From 1841 to 1865 he edited the *Archiv für wissenschaftliche Kunde von Russland*, and in 1874 he published, with H.J.R. Petersen, *Die Grundlagen der Gauss'schen Theorie und die Erscheinungen des Erdmagnetismus im Jahre 1829*.

His son Johann Peter Adolf Erman (1854-), a famous Egyptologist, was born in Berlin on the 31st of October 1854. Educated at Leipzig and Berlin, he became extraordinary professor in 1883 and ordinary professor in 1892 of Egyptology in the university of Berlin, and in 1885 he was appointed director of the Egyptian department of the royal museum. For an account of the Egyptological work of Erman and his school, see Egypt: *Language*.

ERMANARIC (fl. 350-376), king of the East Goths, belonged to the Amali family, and was the son of Achiulf. His name occurs as Ermanaricus (Jordanes), Aírmanareiks (Gothic), *Eormenríc* (A. Sax.), Jörmunrek (Norse), Ermenrîch (M.H. German). Ermanaric built up for himself a vast kingdom, which eventually extended from the Danube to the Baltic and from the Don to the Theiss. He drove the Vandals out of Dacia, compelled the allegiance of the neighbouring tribes of West Goths, procured the submission of the Herules, of many Slav and Finnish tribes, and even of the Esthonians on the shores of the Gulf of Bothnia. In his later days the west Goths threw off his yoke, and, on the invasion of the Huns, rather than witness the downfall of his kingdom he is said by Ammianus Marcellinus to have committed suicide. His fate early became the centre of popular tradition, which found its way into the narrative of Jordanes or Jornandes (*De rebus geticis*, chap. 24), who compared him to Alexander the Great and certainly exaggerated the extent of his kingdom. He is there said to have caused a certain Sunilda or Sanielh to be torn asunder by wild horses on account of her husband's traitorous conduct. Her brothers Sarus and Ammius sought to avenge her. They succeeded in wounding, not in killing the Gothic king, whose death supervened in his one hundred and tenth year from the joint effects of his wound and fear of the Hunnish invasion. This is evidently a paraphrase of popular story which sought to supply plausible reasons for Ermanaric's end. In German legend Ermanaric became the typical cruel tyrant, and references to his crimes abound in German epic and in Anglo-Saxon poetry. He is made to replace Odoacer as the enemy of Dietrich of Bern, his nephew, and his history is related in the Norse *Vilkina* or *Thidrekssagà*, which chiefly embodies German tradition. His evil genius, Sifka, Sibicho or Bicci, brings about the death of his three sons. The Harlungs, Imbrecke and Fritile,[1] are his nephews, whom he has strangled for the sake of their treasure, the Brîsingo meni. Sonhild or Svanhild becomes the wife of Ermanaric, and the motive for her murder is replaced by an accusation of adultery between Svanhild and her stepson. The story was already connected with the Nibelungen when it found its way to the Scandinavian north by way of Germany. In the *Völsunga Saga* Svanhild is the daughter of Sigurd and Gudrun. She is given in marriage to the Gothic king Jörmunrek (Ermanaric), who sends his son Randver as proxy wooer in company of Bicci, the evil counsellor. Randver is persuaded by Bicci to take his father's bride for himself. Randver is hanged and Svanhild trampled to death by horses in the gate of the castle. Gudrun eggs on Sörli and Hamdir or Hamtheow, her two sons by her third husband, Jonakr the Hun, to avenge their sister. On the way they slay their half-brother Erp, whom they suspect of lukewarmness in the cause; arrived in the hall of Ermanaric they make a great slaughter of the Goths, and hew off the hands and feet of Ermanaric, but they themselves are slain with stones. The tale is told with variations by Saxo Grammaticus (*Historia Danica*, ed. Müller, p. 408, &c.), and in the Icelandic poems, the *Lay of Hamtheow*, *Gudrun's Chain of Woe*, and in the prose *Edda*.

Bibliography.—W. Grimm, in *Die deutsche Heldensage* (2nd ed., Berlin, 1867), quotes the account given by Jordanes, references in Beowulf, in the *Wanderer's Song*, *Exeter Book*, in *Parcival*, in *Dietrichs Flucht*, the account given in the *Quedlinburg Chronicle*, by Ekkehard in the *Chronicon Urspergense*, by Saxo Grammaticus, &c. See also Vigfússon and Powell, *Corpus poëticum boreale*, vol. i. (Oxford, 1883), and H. Symons, "Die deutsche Heldensage" in Paul's *Grundriss d. german. Phil.* vol. iii. (Strassburg, 1900).

1 Emerka and Fridla (Beowulf, *Quedlingburg Chron.*), Aki and Etgard (*Vilkina Saga*). In the original myth the Harlungs, who are not to be confused with the Hartung brothers, were sent to bring home Sūryā, the bride of the sky-god, Irmintiu.

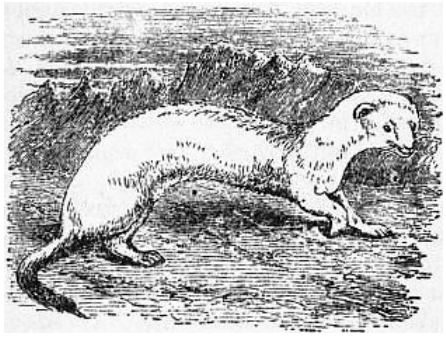
ERMELAND, or ERMLAND (*Varmia*), a district of Germany, in East Prussia, extending from the Frisches Haff, a bay in the Baltic, inland towards the Polish frontier. It is a well-wooded sandy tract of country, has an area of about 1650 sq. m., a population of 240,000, and is divided into the districts of Braunsberg, Heilsberg, Rössel and Allenstein.

Ermeland was originally one of the eleven districts of old Prussia and was occupied by the Teutonic Knights (*Deutscher Orden*), being made in 1250 one of the four bishoprics of the country under their sway. The bishop of Ermeland shortly afterwards declared himself independent of the order, and became a prince of the Empire. In 1466 Ermeland, together with West Prussia, was by the peace of Thorn attached to the crown of Poland, and the bishop had a seat in the Polish senate. In 1772 it was again incorporated with Prussia. Among the bishops of the see, which still exists, with its seat in Frauenberg, may be mentioned Aeneas Sylvius Piccolomini, afterwards Pope Pius II., and Cardinal Stanislaus Hosius (1504-1579), the founder of the Jesuit college in Braunsberg.

See Hipler, *Literaturgeschichte des Bisthums Ermeland* (Braunsberg, 1873); the *Monumenta historiae Warmiensis* (Mainz, 1860-1864, and Braunsberg, 1866-1872, 4 vols.); and Buchholz, *Abriss einer Geschichte des Ermlands* (Braunsberg, 1903.)

ERMELO, a district and town of the Transvaal. The district lies in the south-east of the province and is traversed by the Drakensberg. In it are Lake Chrissie, the only true lake in the country, and the sources of the Vaal, Olifants, Komati, and Usuto rivers, which rise within 30 m. of one another. The region has a general elevation of about 5500 ft. and is fine agricultural and pastoral country, besides containing valuable minerals, including coal and gold. Ermelo town, pop. (1904) 1451, is by rail 175 m. S.E. of Johannesburg, and 74 m. S.S.W. of Machadodorp on the Pretoria-Delagoa Bay railway. A government experimental farm, with some 1000 acres of plantations, is maintained here.

ERMINE, an alternative name for the stoat (*Putorius ermineus*), apparently applicable in its proper sense only when the animal is in its white winter coat. This animal measures 10 in. in length exclusive of the tail, which is about 4 in. long, and becomes bushy towards the point. The fur in summer is reddish brown above and white beneath, changing in the winter of northern latitudes to snowy whiteness, except at the tip of the tail, which at all seasons is black. In Scottish specimens this change in winter is complete, but in those found in the southern districts of England it is usually only partial, the ermine presenting during winter a piebald appearance. The white colour is evidently protective, enabling the animals to elude the observations of their enemies, and to steal unobserved on their prey. It also retains heat better than a dark covering, and may thus serve to maintain an equable temperature at all seasons within the body. The colour change seems to be due to phagocytes devouring the pigment-bodies of the hair, and not to a moult.



Ermine or Stoat (*Putorius ermineus*).

The species is a native of the temperate and subarctic zones of the Old World, and is represented in America by a form which can scarcely be regarded as specifically distinct. It inhabits thickets and stony places, and frequently makes use of the deserted burrows of moles and other underground mammals. Exceedingly sanguinary in disposition, and agile in its movements, it feeds principally on rats, water-rats and rabbits, which it pursues with pertinacity and boldness, hence the name *stoat*, signifying bold, by which it is commonly known. It takes readily to water, and will even climb trees in pursuit of prey. It is particularly destructive to poultry and game, and has often been known to attack hares, fixing itself to the throat of its victim, and defying all the efforts of the latter to disengage it. The female brings forth five young ones about the beginning of summer. The winter coat of the ermine forms one of the most valuable of commercial furs, and is imported in enormous quantities from Norway, Sweden, Russia and Siberia. It is largely used for muffs and tippets, and as a trimming for state robes, the jet black points of the tails being inserted at regular intervals as an ornament. In the reign of Edward III. the wearing of ermine was restricted to members of the royal family; but it

now enters into almost all state robes, the rank and position of the wearer being in many cases indicated by the presence or absence, and the disposition, of the black spots. (See also FUR.)

ERMINE STREET. Documents and writers of the 11th and succeeding centuries occasionally mention four "royal roads" in Britain—Icknield Street, Erning or Ermine Street, Watling Street and Foss Way—as standing apart from all other existing roads and enjoying the special protection of the king. Unfortunately these authorities are not at all agreed as to their precise course; the roads themselves do not occur as specially privileged in actual legal or other practice, and it is likely that the category of Four Roads is the invention of a lawyer or an antiquary. The names are, however, attested to some extent by early charters which name them among other roads, as boundaries. From these charters we know that Icknield Street ran along the Berkshire downs and the Chilterns, that Ermine Street ran more or less due north through Huntingdonshire, that Watling Street ran north-west across the midlands from London to Shrewsbury, and Foss diagonally to it from Lincoln or Leicester to Bath and mid-Somerset. This evidence only proves the existence of these roads in Saxon and Norman days. But they all seem to be much older. Icknield Street is probably a prehistoric ridgeway along the downs, utilized perhaps by the Romans near its eastern end, but in general not Roman. Ermine Street coincides with part of a line of Roman roads leading north from London through Huntingdon to Lincoln. This line is followed by the Old North Road through Cheshunt, Buntingford, Royston, and Huntingdon to Castor near Peterborough; and thence it can be traced through lanes and byways past Ancaster to Lincoln. Watling Street is the Roman highway from London by St Alban's (Verulamium) to Wroxeter near Shrewsbury (Viroconium). Foss is the Roman highway from Lincoln to Bath and Exeter. Hence it has been supposed, and is still frequently alleged, that the Four Roads were the principal highways of Roman Britain. This, however, is not the case. Icknield Street is not Roman and the three roads which follow Roman lines, Ermine Street, Watling Street, and Foss, held no peculiar position in the Romano-British road system (see BRITAIN: *Roman*). In later times, the names Ermine Street, Icknield Street and Watling Street have been applied to other roads of Roman or supposed Roman origin. This, however, is wholly the work of Elizabethan or subsequent antiquaries and deserves no credence.

The derivations of the four names are unknown. Icknield, Ermine and Watling may be from English personal names; Foss, originally Fos, seems to be the Lat. *fossa* in its occasional medieval sense of a bank of upcast earth or stones, such as the *agger* of a road.

(F. J. H.)

ERMOLDUS NIGELLUS, or ERMOLD THE BLACK, was a monk of Aquitaine, who accompanied King Pippin, son of the emperor Louis I., on a campaign into Brittany in 824. Subsequently he was banished from Pippin's court on a charge of inciting the king against his father, and retired to Strassburg, where he sought to regain the emperor's favour by writing a poem on his life and deeds. About 830 he obtained his recall, and has been identified with Hermoldus, who appears as Pippin's chancellor in 838. Ermoldus was a cultured man with a knowledge of the Latin poets, and this poem, *In honorem Hludovici imperatoris*, has some historical value. It consists of four books and deals with the life and exploits of Louis from 781 to 826. He also wrote two poems in imitation of Ovid, which were addressed to Pippin.

His writings are published in the *Monumenta Germaniae historica, Scriptores*, Band 2 (Hanover, 1826 fol.); by J.P. Migne in the *Patrologia Latina*, tome 105 (Paris, 1844); and by E. Dümmler in the *Poëtae Latini aevi Carolini*, Band 2 (Berlin, 1881-1884). See W.O. Henkel, *Über den historischen Werth der Gedichte des Ermoldus Nigellus* (Eilenburg, 1876); W. Wattenbach, *Deutschlands Geschichtsquellen*, Band 1 (Berlin, 1904); and A. Potthast, *Bibliotheca historica*, pp. 430-431 (Berlin, 1896).

ERNE, the name of a river and two lakes in the north-west of Ireland. The river rises in Lough Gowna, county Longford, 214 ft. above sea-level, flows north through Lough Oughter with a serpentine course and a direction generally northward, and then broadens into the Upper Lough Erne, a shallow irregular sheet of water 13 m. long, so beset with islands as to present the appearance of a number of water-channels ramifying through the land. The river then winds past the town of Enniskillen on its island, and enters Lough Erne, a beautiful lake nearly 18 m. long and 5 m.

in extreme width, containing many islands, but less closely covered with them than the upper lough. One of them, Devenish, is celebrated for its antiquarian remains (see Enniskillen). The river then runs westward to Donegal Bay, forming a fine fall at Ballyshannon (*q.v.*). Lough Erne contains trout and pike. These waters admit of navigation by small steamers, but little trade is carried on. The area of the Erne basin, which includes a vast number of small loughs, is about 1600 sq. m., and it covers part of the counties Cavan, Longford, Leitrim, Fermanagh and Donegal. The length of the Erne valley is about 70 m.

ERNEST I. [Ernst Anton Karl Ludwig], duke of Saxe-Coburg-Gotha (1784-1844), was the son of Francis, duke of Saxe-Coburg-Saalfeld, and was born on the 2nd of January 1784. At the time of his father's death (9th of December 1806) the duchy of Coburg was occupied by Napoleon as conquered territory, and Ernest did not come into his inheritance till after the peace of Tilsit (July 1807). Owing to the part he had played in assisting the Prussians at the battle of Auerstädt he continued out of favour with Napoleon, and he threw himself with vigour into the war of liberation against the French. After the battle of Leipzig he was given the command of the V. army corps and reduced Mainz by blockade; he also commanded the Saxon troops during the campaign of 1815. By the congress of Vienna he was rewarded with the principality of Lichtenberg on the left bank of the Rhine, which received a slight augmentation after the second peace of Paris. These territories he sold to Prussia in 1834. In 1826, in the division of the territories of the duchy of Saxe-Gotha which followed the death of its last duke (February 1825), he received the duchy of Gotha, ceding that of Saalfeld to the duke of Meiningen; and he now exchanged his style of Ernest III. of Saxe-Coburg-Saalfeld for that of Ernest I. of Saxe-Coburg-Gotha. In 1821 he had given a constitution to Coburg, but he did not interfere with the traditional system of estates at Gotha. He died on the 29th of January 1844.

Duke Ernest, who was not only a good soldier and keen sportsman, but an enlightened patron of the arts and sciences, did much for the economic, educational and constitutional development of his territories; and his advice always carried great weight in the councils of the other German sovereigns. It was, however, for the splendid international position attained by the house of Coburg under him that his reign is chiefly distinguished. His younger brother Leopold (*q.v.*) became king of the Belgians; his brother Ferdinand (b. 1785) married the wealthy princess Antoinette von Kohary (1816) and was the father of the duchess of Nemours and of the future King Ferdinand of Portugal. Of his sisters, Antoinette (1779-1824) married Duke Alexander of Württemberg; Juliane [Alexandra Feodorovna] (1781-1860) married the Russian cesarevich Constantine, from whom she was, however, divorced in 1820; and Victoria (1786-1861), wife of Edward Augustus, duke of Kent, became the mother of Queen Victoria. Duke Ernest was twice married: (1) in 1817 to Louise, daughter of Duke Augustus of Saxe-Gotha, whom he finally divorced in 1826; (2) in 1831 to Maria, daughter of Duke Alexander of Württemberg. Of his sons, by his first wife, Ernest succeeded him in the duchy, and Albert married Queen Victoria.

ERNEST II., duke of Saxe-Coburg-Gotha (1818-1893), was born at Coburg on the 21st of June 1818, being the eldest son of Duke Ernest I. He enjoyed a varied education; he studied at the university of Bonn with his brother Albert; his military training he received in the Saxon army. The widespread connexions of his family opened to him many courts of Europe, and after he became of age he travelled much. The position of his uncle Leopold, who was king of the Belgians, and especially the marriage of his brother Albert to the queen of England, his cousin, gave him peculiar opportunities for becoming acquainted with the political problems of Europe. In 1840-1841 he undertook a journey to Spain and Portugal; in the latter country another cousin, Ferdinand, was king-consort. In 1844 he succeeded his father. His own character and the influence of the king of the Belgians made him one of the most Liberal princes in Germany. He was able to bring to a satisfactory conclusion disputes with the Coburg estates. He passed through the ordeal of the revolution of 1848 with little trouble, for he anticipated the demands of the people of Gotha for a reform, and in 1852 introduced a new constitution by which the administration of his two duchies was assimilated in many points. The government of his small dominions did not afford sufficient scope for his restless and versatile ambition; his desire to play a great part in German affairs was probably increased by the feeling that, though he was the head of his house, he was to some extent overshadowed by the younger branches of the family which ruled in Belgium, England and Portugal. He was one of the foremost supporters of every attempt made to reform the German constitution and bring about the unity of Germany. He took a warm interest in the proceedings of the Frankfort parliament, and it was often said, probably without reason, that he hoped to be chosen emperor himself. However that may be, he strongly urged the king of Prussia to accept that position when it was offered him in 1849; he took a very prominent part in the complicated negotiations of the following year, and it was at his

suggestion that a congress of princes met at Berlin in 1850. He highly valued the opportunities which this and similar meetings gave him for exercising political influence, and he would have felt most at home as a member of a permanent council of the German princes.

Ambitious also of military distinction, and sympathizing with the rising of the people of Schleswig-Holstein against the Danes in 1849, Ernest accepted a command in the federal army. In the engagement of Eckernförde in April 1849 the troops under his orders succeeded in capturing two Danish frigates, a remarkable feat of which he was justly proud. His greatest services to Germany were performed during the years of reaction which followed; almost alone among the German princes he remained faithful to the Liberal and National ideals, and he allowed his dominions to be used as an asylum by the writers and politicians who had to leave Prussia and Saxony. The reactionary parties looked on him with great suspicion, and it was at this time that he formed a friendship with Gustav Freytag, the celebrated novelist, whom he protected when the Prussian government demanded his arrest. His connexion with the English court gave him a position of much influence, but no one was more purely German in his feelings and opinions. The marriage of his niece Victoria with Frederick, the heir to the Prussian throne, strengthened his connexion with Prussia, but caused the Conservative party to look with increased suspicion on the Coburg influence. He was the first German prince to visit Napoleon III., and was present when Orsini made his celebrated attempt on the emperor's life. After 1860 he became the chief patron and protector of the *National Verein*; he encouraged the newly-formed rifle clubs, and notwithstanding the strong disapproval of his fellow-monarchs, allowed his court to become the centre of the rising national agitation. Still a warm adherent of Prussia, in 1862 he set an example to the other princes by voluntarily making an agreement by which his troops were placed in war under the command of the king of Prussia. Like all the other Nationalists, he was much embarrassed by the policy of Bismarck, and the democratic opinions of the Coburg court, which were shared by the crown prince Frederick, were a serious embarrassment to that minister. The opposition became more accentuated when the duke allowed his dominions to be used as the headquarters of the agitation in favour of Frederick, duke of Augustenburg, who claimed the duchies of Schleswig and Holstein, and it was at this time that Bismarck is reported to have said that if Frederick the Great had been alive the duke would have been in the fortress of Spandau. In 1863 he was present at the *Fürstentag* in Frankfort, and from this time was in more frequent communication with the Austrian court, where his cousin Alexander, Count Mensdorff, was minister. However, when war broke out in 1866, he at once placed his troops at the disposition of Prussia; Bismarck had in an important letter explained to him his policy and tactics. He was personally concerned in one of the most interesting events of the war; for the Hanoverian army, in its attempt to march south and join the Bavarians, had to pass through Thuringia, and the battle of Langensalza was fought in the immediate neighbourhood of Gotha. His troops took part in the battle, which ended in the rout of the Prussians, the duke, who was not present during the fight, in vain attempting to stop it. He bore an important share in the negotiations before and after the battle, and his action at this time has been the subject of much controversy, for it was suggested that while he offered to mediate he really acted as a partisan of Prussia. For his services to Prussia he received as a present the forest of Schmalkalden. He was with the Prussian headquarters in Bohemia during the latter part of the war.

With the year 1866 the political rôle which Ernest had played ended. The result was perhaps not quite equal to his expectations, but it must be remembered how difficult was the position of the minor German princes; and he quoted with great satisfaction the words used in 1871 by the emperor William at Versailles, that "to him in no small degree was due the establishment of the empire." He was a man of varied tastes, a good musician—he composed several operas and songs—and a keen sportsman, a quality in which he differed from his brother. Notwithstanding his Liberalism, he had a great regard for the dignity of his rank and family, and in his support of constitutional government would never have sacrificed the essential prerogatives of sovereignty. He died at Reinhardsbrunn on the 22nd of August 1893. In 1842 the duke married Alexandrine, daughter of the grandduke of Baden; there were no children by this marriage and the succession to Saxe-Coburg-Gotha passed therefore to the children of his younger brother Albert. By Albert's marriage contract the duchy could not be held together with the English crown; thus his eldest son, afterwards Edward VII., was passed over and it came to his second son, Alfred, duke of Edinburgh (1844-1900). When Alfred died without sons in July 1900 the succession to the duchy passed to a younger brother Arthur, duke of Connaught; but the duke and his son, Arthur, passed on their claim to Charles Edward, duke of Albany (b. 1884), who became duke of Saxe-Coburg-Gotha in succession to his uncle Alfred. In 1905 Charles Edward married Victoria Adelaide (b. 1885), princess of Schleswig-Holstein, by whom he has a son John Leopold (b. 1906).

Duke Ernest was something of a writer. He brought out an account of the travels in Egypt and Abyssinia which he undertook in 1862 as *Reise des Herzogs Ernst von Sachsen-Koburg-Gotha nach Ägypten* (Leipzig, 1864); and he published his memoirs, *Aus meinem Leben und aus meiner Zeit* (Berlin, 1887-1889). This work is in three volumes and contains much valuable information on a most critical period of German history; there is an English translation by P. Andreae (1888-1890).

See also Sir T. Martin, *Life of H.R.H. the Prince Consort* (1875-1880); Hon. C. Grey, *Early Years of the Prince Consort* (1867); A. Ohorn, *Herzog Ernst II., ein Lebensbild* (Leipzig, 1894); and E. Tempeltey, *Herzog Ernst von Koburg und das Jahr 1866* (Berlin, 1898).

(J. W. He.)

ERNEST AUGUSTUS (1771-1851), king of Hanover and duke of Cumberland, fifth son of the English king George III., was born at Kew on the 5th of June 1771. Having studied at the university of Göttingen, he entered the Hanoverian army, serving as a leader of cavalry when war broke out between Great Britain and France in 1793, and winning a reputation for bravery. He lost the sight of one eye at the battle of Tournai in May 1794, and when Hanover withdrew from the war in 1795 he returned to England, being made lieutenant-general in the British army in 1799. In the same year he was created duke of Cumberland and Teviotdale and granted an allowance of £12,000 a year, after which he held several lucrative military positions in England, and began to attend the sittings of the House of Lords and to take part in political life. A stanch Tory, the duke objected to all proposals of reform, especially to the granting of any relief to the Roman Catholics, and had great influence with his brother the prince regent, afterwards King George IV., in addition to being often consulted by the Tory leaders. In 1810 he was severely injured by an assassin, probably his valet Sellis, who was found dead; and subsequently two men were imprisoned for asserting that the duke had murdered his valet. Recovering from his wounds, Cumberland again proceeded to the seat of war; and having been made a British field-marshal, was in command of the Hanoverian army during the campaigns of 1813 and 1814, being present, although not in action, at the battle of Leipzig. In May 1815 Ernest married his cousin, Frederica (1778-1841), daughter of Charles II. duke of Mecklenburg-Strelitz and widow of Frederick, prince of Solms-Braunfels, a union which was very repugnant to his mother Queen Charlotte, and was disliked in England, where the duke's strong Toryism had made him unpopular. Parliament refused to increase his allowance from £18,000, to which it had been raised in 1804, to £24,000 a year, and indignant at the treatment he received the duke spent some years in Berlin. Returning to England after the accession of George IV. in 1820, his political power was again considerable, while deaths in the royal family made it likely that he would succeed to the throne. Although his personal influence with the sovereign ceased upon the death of George IV. in 1830, the duke continued to oppose all measures for the extension of civil and religious liberty, including the Reform Bill of 1832; and his unpopularity was augmented by suspicions that he had favoured the formation of Orange lodges in the army. When William IV. died in June 1837, the crowns of Great Britain and Hanover were separated; and Ernest, as the nearest male heir of the late king, became king of Hanover. At once cancelling the constitution which William had given to his kingdom in 1833, he acted as an absolute monarch, and the constitution which he sanctioned in 1840 was permeated with his own illiberal ideas. In German politics he was vigilant and active, and mindful of the material interests of his country. His reign, however, was a stormy one, and serious trouble between king and people had arisen when he died at Herrenhausen on the 18th of November 1851 (see HANOVER: *History*). In spite of his arbitrary rule and his reactionary ideas the king was popular among his subjects, and his statue in Hanover bears the words "*Dem Landes Vater sein treues Volk*." Ernest, who is generally regarded as the ablest of the sons of George III., left an only child, George, who succeeded him as king of Hanover.

See C.A. Wilkinson, *Reminiscences of the Court and Times of King Ernest of Hanover* (London, 1886); von Malortie, *König Ernst August* (Hanover, 1861); and the various histories of Great Britain and Hanover for the period.

ERNESTI, JOHANN AUGUST (1707-1781), German theologian and philologist, was born on the 4th of August 1707, at Tennstädt in Thuringia, of which place his father was pastor, besides being superintendent of the electoral dioceses of Thuringia, Salz and Sangerhausen. At the age of sixteen he was sent to the celebrated Saxon cloister school of Pforta (Schulpforta). At twenty he entered the university of Wittenberg, and studied afterwards at the university of Leipzig. In 1730 he was made master in the faculty of philosophy. In the following year he accepted the office of conrector in the Thomas school of Leipzig, of which J.M. Gesner was then rector, an office to which Ernesti succeeded in 1734. He was, in 1742, named professor *extraordinarius* of ancient literature in the university of Leipzig, and in 1756 professor *ordinarius* of rhetoric. In the same year he received the degree of doctor of theology, and in 1759 was appointed professor *ordinarius* in the faculty of theology. Through his learning and his manner of discussion, he co-operated with S.J. Baumgarten of Halle (1706-1757) in disengaging the current dogmatic theology from its many scholastic and mystical excrescences, and thus paved a way for a revolution in theology. He died, after a short illness, in his seventy-sixth year, on the 11th of September 1781.

It is perhaps as much from the impulse which Ernesti gave to sacred and profane criticism in Germany, as from the intrinsic excellence of his own works in either department, that he must derive his reputation as a philologist or theologian. With J.S. Semler he co-operated in the revolution of Lutheran theology, and in conjunction with Gesner he instituted a new school in ancient literature. He detected grammatical niceties in Latin, in regard to the consecution of tenses which had escaped

preceding critics. His canons are, however, not without exceptions. As an editor of the Greek classics, Ernesti hardly deserves to be named beside his Dutch contemporaries, Tiberius Hemsterhuis (1685-1766), L.C. Valckenaer (1715-1785), David Ruhnken (1723-1798), or his colleague J.J. Reiske (1716-1774). The higher criticism was not even attempted by Ernesti. But to him and to Gesner is due the credit of having formed, by discipline and by example, philologists greater than themselves, and of having kindled the national enthusiasm for ancient learning. It is chiefly in hermeneutics that Ernesti has any claim to eminence as a theologian. But here his merits are distinguished, and, at the period when his *Institutio Interpretis N. T.* was published (1761), almost peculiar to himself. In it we find the principles of a general interpretation, formed without the assistance of any particular philosophy, but consisting of observations and rules which, though already enunciated, and applied in the criticism of the profane writers, had never rigorously been employed in biblical exegesis. He was, in fact, the founder of the grammatico-historical school. He admits in the sacred writings as in the classics only one acceptation, and that the grammatical, convertible into and the same with the logical and historical. Consequently he censures the opinion of those who in the illustration of the Scriptures refer everything to the illumination of the Holy Spirit, as well as that of others who, disregarding all knowledge of the languages, would explain words by things. The “analogy of faith,” as a rule of interpretation, he greatly limits, and teaches that it can never afford of itself the explanation of words, but only determine the choice among their possible meanings. At the same time he seems unconscious of any inconsistency between the doctrine of the inspiration of the Bible as usually received and his principles of hermeneutics.

Among his works the more important are:—I. In classical literature: *Initia doctrinae Solidioris* (1736), many subsequent editions; *Initia rhetorica* (1730); editions, mostly annotated, of Xenophon’s *Memorabilia* (1737), Cicero (1737-1739), Suetonius (1748), Tacitus (1752), the *Clouds* of Aristophanes (1754), Homer (1759-1764), Callimachus (1761), Polybius (1764), as well as of the *Quaestura* of Corradus, the Greek lexicon of Hedericus, and the *Bibliotheca Latina* of Fabricius (unfinished); *Archaeologia litteraria* (1768), new and improved edition by Martini (1790); Horatius Tursellinus *De particulis* (1769). II. In sacred literature: *Antimuratorius sive confutatio disputationis Muratorianae de rebus liturgicis* (1755-1758); *Neue theologische Bibliothek*, vols. i. to x. (1760-1769); *Institutio interpretis Nov. Test.* (3rd ed., 1775); *Neueste theologische Bibliothek*, vols. i. to x. (1771-1775). Besides these, he published more than a hundred smaller works, many of which have been collected in the three following publications:—*Opuscula oratoria* (1762, 2nd ed., 1767); *Opuscula philologica et critica* (1764, 2nd ed., 1776); *Opuscula theologica* (1773). See Herzog-Hauck, *Realencyklopädie*; J.E. Sandys, *Hist. of Class. Schol.* iii. (1908).

ERNESTI, JOHANN CHRISTIAN GOTTLIEB (1756-1802), German classical scholar, was born at Arnstadt, Thuringia, and studied under his uncle, J.A. Ernesti, at the university of Leipzig. On the 5th of June, 1782, he was made supplementary professor of philosophy at his own university; and on the death of his cousin August Wilhelm in 1801 he was for five months professor of rhetoric. He died on the 5th of June of the following year.

His principal works are:—Editions of Aesop’s *Fabulae* (1781); of the *Glossae sacrae of Hesychius* (1785) and *Suidas and Phavorinus* (1786); and of *Silius Italicus Punica* (1791-1792); *Lexicon Technologiae Graecorum rhetoricae* (1795); *Lexicon technologiae Latinorum rhetoricae* (1797), and Cicero’s *Geist und Kunst* (1799-1802).

ERNST, HEINRICH WILHELM (1814-1865), German violinist and composer, was born at Brünn, in Moravia, in 1814. He was educated at the Conservatorium of Vienna, studying the violin under Joseph Böhm and Joseph Mayseder, and composition under Ignaz von Seyfried. At the age of sixteen he made a concert tour in south Germany, which established his reputation as a violinist of the highest promise. In 1832 he went to Paris, where he lived for several years. During this period he formed an intimacy with Stephen Heller, which resulted in their charming joint compositions—the *Pensées fugitives* for piano and violin. In 1843 he paid his first visit to London. The impression which he then made as a violinist was more than confirmed in the following year, when his rare powers were recognized by the musical public. Thenceforward he visited England nearly every year, until his health broke down owing to long-continued neuralgia of a most severe kind. The last seven years of his life were spent in retirement, chiefly at Nice, where he died on the 8th of October 1865. As a violinist Ernst was distinguished by his almost unrivalled executive power, loftiness of conception, and intensely passionate expression. As a composer he wrote chiefly for his own instrument, and his *Elegie* and *Otello Fantasia* rank among the most treasured works for the violin.

ERODE, a town of British India, in the Coimbatore district of Madras, situated on the right bank of the river Cauvery, which is here crossed by an iron railway girder bridge of 22 spans. Pop. (1901) 15,529. Here the South Indian railway joins the South-Western line of the Madras railway, 243 m. from Madras. There are exports of cotton and saltpetre; and the town has a steam cotton press.

EROS, a minor planet discovered by Witt at Berlin on the 14th of August 1898, and, so far as yet known, unique in that its perihelion lies far within the orbit of Mars.

EROS, in Greek mythology, the god of love. He is not mentioned in Homer; in Hesiod (*Theog.* 120) he is one of the oldest and the most beautiful of the gods, whose power neither gods nor men can resist. He also evolves order and harmony out of Chaos by uniting the separated elements. This cosmic Eros, who in Orphic cosmogony sprang from the world-egg which Chronos, or Time, laid in the bosom of Chaos, and which is the origin of all created beings, degenerated in later mythology into the capricious god of sexual passion, the son of Aphrodite and Zeus, Ares or Hermes. He is commonly represented as a mischievous boy, the tormentor of gods and men, even his own mother not being proof against his attacks. His brother is Anteros, the god of mutual love, who punishes those who do not return the love of others, without which Eros could not thrive; he is sometimes described as the opponent of Eros. The chief associates of Eros are Pothos and Himeros (Longing and Desire), Peitho (Persuasion), the Muses and the Graces; he himself is in constant attendance on Aphrodite. Later writers (Euripides being the first) assumed the existence of a number of Erotes (like the Roman Amores and Cupidines) with similar attributes. According to the philosophers, Eros was not only the god of sexual love, but also of the loyal and devoted friendship of men; hence the Theban "Sacred Band" was devoted to him, and the Cretans and Spartans offered sacrifice to him before going into battle (Athenaeus xiii. p. 561). In Alexandrian poetry Eros is at one time the powerful god who conquers all, at another the elfish god of love. For the Roman adaptation of Eros see Cupid, and for the later legend of Cupid and Psyche see Psyche.

In art Eros is represented as a beautiful youth or a winged child. His attributes are the bow and arrows and a burning torch. The rose, the hare, the cock and the goat are frequently associated with him. The most celebrated statue of him was at Thespiae, the work of Praxiteles. Other famous representations are the Vatican torso and Eros trying his bow (in the Capitoline museum).

See J.E. Harrison, *Prolegomena to the Study of Greek Religion* (1903); G.F. Schömann, *De Cupidine Cosmogonico* (1852); E. Gerhard, *Über den Gott Eros* (1850); articles in Roscher's *Lexikon der Mythologie*, Daremberg and Saglio's *Dictionnaire des antiquités*, and Pauly-Wissowa's *Realencyclopädie*.

ERPENIUS (original name van Erpe), **THOMAS** (1584-1624), Dutch Orientalist, was born at Gorcum, in Holland, on the 11th of September 1584. After completing his early education at Leiden, he entered the university of that city, and in 1608 took the degree of master of arts. By the advice of Scaliger he studied Oriental languages whilst taking his course of theology. He afterwards travelled in England, France, Italy and Germany, forming connexions with learned men, and availing himself of the information which they communicated. During his stay at Paris he contracted a friendship with Casaubon, which lasted during his life, and also took lessons in Arabic from an Egyptian, Joseph Barbatus, otherwise called Abu-dakni. At Venice he perfected himself in the Turkish, Persic and Ethiopic languages. After a long absence, Erpenius returned to his own country in 1612, and on the 10th of February 1613 he was appointed professor of Arabic and other Oriental languages, Hebrew excepted, in the university of Leiden. Soon after his settlement at Leiden, animated by the example of Savary de Brèves, who had established an Arabic press at Paris at his own charge, he caused new Arabic characters to be cut at a great expense, and erected a press in his own house. In 1619 the curators of the university of Leiden instituted a second chair of Hebrew in his favour. In 1620 he was sent by the States of Holland to induce Pierre Dumoulin or André Rivet to settle in that country; and after a second journey he was successful in inducing Rivet to comply with their request. Some time after the return of Erpenius, the states appointed him their interpreter; and in this capacity he had the duty imposed upon him of translating and replying to the different letters of the Moslem princes of Asia and Africa. His reputation had now spread throughout all Europe, and several princes, the

kings of England and Spain, and the archbishop of Seville made him the most flattering offers; but he constantly refused to leave his native country. He was preparing an edition of the Koran with a Latin translation and notes, and was projecting an Oriental library, when he died prematurely on the 13th of November 1624.

Among his works may be mentioned his *Grammatica Arabica*, published originally in 1613 and often reprinted; *Rudimenta linguae Arabicae* (1620); *Grammatica Ebraea generalis* (1621); *Grammatica Chaldaica et Syria* (1628); and an edition of Elmacin's *History of the Saracens*.

ERROLL (or ERROL), **FRANCIS HAY,** 9TH EARL OF (d. 1631), Scottish nobleman, was the son of Andrew, 8th earl, and of Lady Jean Hay, daughter of William, 6th earl. The date of his birth is unrecorded, but he succeeded to the earldom (cr. 1453) in 1585, was early converted to Roman Catholicism, and as the associate of Huntly joined in the Spanish conspiracies against the throne of Elizabeth. A letter written by him, declaring his allegiance to the king of Spain, having been intercepted and sent by Elizabeth to James in February 1589, he was declared a rebel by the council. He engaged with Huntly and Crawford in a rebellion in the north of Scotland, but their forces surrendered at Aberdeen on the arrival of the king in April; and in July Erroll gave himself up to James, who leniently refrained from exacting any penalty. In September of the same year he entered into a personal bond with Huntly for mutual assistance; and in 1590 displeased the king by marrying, in spite of his prohibition, Lady Elizabeth Douglas, daughter of the earl of Morton. He was imprisoned on suspicion of complicity in the attempt made by Gray and Bothwell to surprise the king at Falkland in June 1592; and though he obtained his release, he was again proclaimed a rebel on account of the discovery of his signature to two of the "Spanish Blanks," unwritten sheets subscribed with the names of the chief conspirators in a plot for a Spanish invasion of Scotland, to be filled up later with the terms of the projected treaty. After a failure to apprehend him in March 1593, Erroll and his companions were sentenced to abjure Romanism or leave the kingdom; and on their non-compliance were in 1594 declared traitors. On the 3rd of October they defeated at Glenlivet a force sent against them under Argyll; though Erroll himself was severely wounded, and Slains Castle, his seat, razed to the ground. The rebel lords left Scotland in 1595, and Erroll, on report of his further conspiracies abroad, was arrested by the states of Zealand, but was afterwards allowed to escape. He returned to Scotland secretly in 1596, and on the 20th of June 1597 abjured Romanism and made his peace with the Kirk. He enjoyed the favour of the king, and in 1602 was appointed a commissioner to negotiate the union with England. His relations with the Kirk, however, were not so amicable. The reality of his conversion was disputed, and on the 21st of May 1608 he was confined to the city of Perth "for the better resolution of his doubts," being subsequently declared an obstinate "papist," excommunicated, deprived of his estate, and imprisoned at Dumbarton; and after some further vacillation was finally released in May 1611. Lord Erroll died on the 16th of July 1631, and was buried in the church of Slains. He married (1) Anne, daughter of John, 4th earl of Atholl; (2) Margaret, daughter of the regent Murray; and (3) Elizabeth, daughter of William, 6th earl of Morton. By his third wife he had several children, of whom his eldest son, William, succeeded him. The dispute which began in his lifetime concerning the hereditary office of lord high constable between the families of Erroll and of the Earl Marischal was settled finally in favour of the former; thus establishing the precedence enjoyed by the earls of Erroll next after the royal family over all other subjects in Scotland.

See *The Erroll Papers* (Spalding Club Miscellany, vol. ii. 211); Andrew Lang, *Hist. of Scotland*, vol. ii.; *Hist. MSS. Comm. MSS. of Earl of Mar and Kellie*; D. Calderwood's *Hist. of the Church of Scotland*; John Spalding's *Memorials* (Spalding Club, 1850); *Collected Essays* of T.G. Law, ed. by P.H. Brown (1904); *Treason and Plot*, by M.A.S. Hume (1901).

ERROR (Lat. *error*, from *errare*, to wander, to err), a mistake, a departure or deviation from what is true, exact or right. For the legal process by which a judgment could be reversed on the ground of error, known as a "writ of error," see WRIT and APPEAL. The words "error excepted" or "errors and omissions excepted" (contracted to "E.E." "E. & O.E."), are frequently placed at the end of a statement of account or an invoice, so that the accounting party may reserve the right to correct any errors or omissions which may be subsequently discovered, or make further claims in respect of them. In mathematics, "error" is the deviation of an observed or calculated quantity from its true value. The calculus of errors leads to the formulation of the "law of error," which is an analytical expression of the most probably true value of a series of discordant values (see PROBABILITY).

ERSCH, JOHANN SAMUEL (1766-1828), the founder of German bibliography, was born at Grossglogau, in Silesia, on the 23rd of June 1766. In 1785 he entered the university of Halle with the view of studying theology; but soon his whole attention became engrossed by history, bibliography and geography. At Halle he made the acquaintance of J.E. Fabri, professor of geography; and when the latter was made professor of history and statistics at Jena, Ersch accompanied him thither, and aided him in the preparation of several works. In 1788 he published the *Verzeichnis aller anonymischen Schriften*, as a supplement to the 4th edition of Meusel's *Gelehrtes Deutschland*. The researches required for this work suggested to him the preparation of a *Repertorium über die allgemeinen deutschen Journale und andere periodische Sammlungen für Erdbeschreibung, Geschichte, und die damit verwandten Wissenschaften* (Lemgo, 1790-1792). The fame which this publication acquired him led to his being engaged by Schütz and Hufeland to prepare an *Allgemeines Repertorium der Literatur*, published in 8 vols. (Jena and Weimar, 1793-1809), which condensed the literary productions of 15 years (1785-1800), and included an account not merely of the books published during that period, but also of articles in periodicals and magazines, and even of the criticisms to which each book had been subjected. While engaged in this great work he also projected *La France littéraire*, which was published at Hamburg in 5 vols., from 1797 to 1806. In 1795 he went to Hamburg to edit the *Neue Hamburger Zeitung*, founded by Victor Klopstock, brother of the poet, but returned in 1800 to Jena to take active part in the *Allgemeine Literaturzeitung*. He also obtained in the same year the office of librarian in the university, and in 1802 was made professor of philosophy. In 1803 he accepted the chair of geography and statistics at Halle, and in 1808 was made principal librarian. He here projected a *Handbuch der deutschen Literatur seit der Mitte des 18. Jahrh. bis auf die neueste Zeit* (Leipzig, 1812-1814) and, along with Johann Gottfried Gruber (*q.v.*), the *Allgemeine Encyklopädie der Wissenschaften und Künste* (Leipzig, 1818 ffg.) which he continued as far as the 21st volume. The accuracy and thoroughness of this monumental encyclopaedia make it still an indispensable book of reference. Ersch died at Halle on the 16th of January 1828.

ERSKINE, EBENEZER (1680-1754), Scottish divine, the chief founder of the Secession Church (formed of dissenters from the Church of Scotland), was born on the 22nd of June 1680, most probably at Dryburgh, Berwickshire. His father, Henry Erskine, who was at one time minister at Cornhill, Durham, was ejected in 1662 by the Act of Uniformity, and, after suffering some years' imprisonment, was after the Revolution appointed to the parish of Chirnside, Berwickshire. After studying at the university of Edinburgh, Ebenezer became minister of Portmoak, Kinross-shire. There he remained for twenty-eight years, after which, in the autumn of 1731, he was translated to the West Church, Stirling. Some time before this, he, along with some other ministers, was "rebuked and admonished," by the general assembly, for defending the doctrines contained in the *Marrow of Modern Divinity* (see Boston, Thomas). A sermon which he preached on lay patronage before the synod of Perth in 1733 furnished new grounds of accusation, and he was compelled to shield himself from rebuke by appealing to the general assembly. Here, however, the sentence of the synod was confirmed, and after many fruitless attempts to obtain a hearing, he, along with William Wilson of Perth, Alexander Moncrieff of Abernethy and James Fisher of Kinclaven, was suspended from the ministry by the commission in November of that year. Against this sentence they protested, and constituted themselves into a separate church court, under the name of the associate presbytery. In 1739 they were again summoned before the assembly, and in their corporate capacity declined to acknowledge the authority of the church, and were deposed in the following year. They received numerous accessions to their communion, and remained in harmony with each other till 1747, when a division took place in regard to the nature of the oath administered to burgesses. Erskine joined with the "burgher" section, and became their professor of theology. He continued also to preach to a numerous congregation in Stirling till his death, which took place on the 2nd of June 1754. Erskine was a very popular preacher, and a man of considerable force of character; he acted throughout on principle with honesty and courage. The burgher and anti-burgher sections of the Secession Church were reunited in 1820, and in 1847 they united with the relief synod in forming the United Presbyterian Church.

Erskine's published works consist chiefly of sermons. His *Life and Diary*, edited by the Rev. Donald Fraser, was published in 1840. His *Works* were published in 1785.

ERSKINE, HENRY (1746-1817), lord advocate of Scotland, the second son of Henry David, 10th earl of Buchan and brother of the lord chancellor Erskine, was born in Edinburgh on the 1st of November 1746. He was educated at the universities of St Andrews, Glasgow and Edinburgh, and was admitted a member of the faculty of advocates in 1768. His reputation as a clever and fluent speaker was first made in the debates of the general assembly, of which he had been early elected an

elder. In 1783 he was appointed to the office of lord advocate, which he held during the brief coalition ministry of Fox and North. In 1785 he was elected dean of the faculty of advocates, and was re-elected annually till 1796, when his conduct in moving a series of resolutions at a public meeting, condemning the government's sedition and treason bills, brought on him the opposition of the ministerial party, and he was deposed in favour of Robert Dundas. On the formation of the Grenville ministry in 1806 he again became lord advocate and was returned to parliament for the Haddington burghs, which he exchanged at the general election of the same year for the Dumfries burghs. His tenure of the lord advocateship ended in March 1807 on the downfall of the ministry. In 1811 he gave up his practice at the bar and retired to his country residence of Almondel, in Linlithgowshire, where he died on the 8th of October 1817.

His eldest son, Henry David (1783-1857), succeeded as 12th earl of Buchan on his uncle's death in 1829.

Erskine's reputation will survive as the finest and most eloquent orator of his day at the Scottish bar; added to a charming forensic style was a most captivating wit, which, as Lord Jeffrey said, was "all argument, and each of his delightful illustrations a material step in his reasoning." Erskine was also the author of some poems, of which the best known is "The Emigrant" (1783).

See Lieut.-Col. A. Fergusson's *Henry Erskine* (1882).

ERSKINE, JOHN (1721-1803), Scottish divine, son of John Erskine of Carnock, was born on the 2nd of June 1721. He studied law for a time after completing his course in arts at the university of Edinburgh, but was eventually licensed to preach in 1743; and was successively parish minister of Kirkintilloch, near Glasgow, Culross, in Fifeshire (1753), New Greyfriars church in Edinburgh (1758), and Old Greyfriars church in 1768, where he became the colleague of Principal Robertson, the historian. Here he remained until his death, which took place on the 19th of January 1803. Dr Erskine's writings consist chiefly of controversial pamphlets on theological subjects. His sermons are clear, vigorous expositions of a moderate Calvinism, in which metaphysical argument and practical morality are happily blended. In church politics he was the leader of the evangelical party; and was much beloved for his high character and amiability.

For his life and works see Sir H. Moncreiff Wellwood, *Life and Writings of J. Erskine, D.D.* (Edinburgh, 1818).

ERSKINE, JOHN, of Carnock (1695-1768), Scottish jurist, son of Lieut.-Colonel John Erskine, was born in 1695. He was admitted a member of the faculty of advocates in 1719. Although he never enjoyed much practice at the bar, he acquired a high reputation as a sound and learned lawyer, and in 1737 was appointed professor of Scots law in the university of Edinburgh. In 1754 he published his *Principles of the Law of Scotland*. He retired from his chair in 1765; and during the remainder of his uneventful life he occupied himself with the preparation of his great work, the *Institutes of the Law of Scotland*, which he did not live to publish. He died at Cardross, Perthshire, on the 1st of March 1768.

Erskine's *Institutes*, although not exhibiting the grasp of principle which distinguished his great predecessor Lord Stair, is so conspicuous for learning, accuracy and sound good sense, that it has always been esteemed of the highest authority on the law of Scotland. The first edition appeared in 1773 and it has been many times reprinted. The *Principles*, although published first, is substantially an abridgment of the larger work, and is in some respects superior to it, being more concise and direct. It retains its place as the text-book on Scots law, and is frequently being re-edited.

ERSKINE, JOHN, of Dun (1509-1591), Scottish reformer, the son of Sir John Erskine, laird of Dun, was born in 1509, and was educated at King's College, Aberdeen. At the age of twenty-one Erskine was the cause—probably by accident—of a priest's death, and was forced to go abroad, where he came under the influence of the new learning. It was through his agency that Greek was first taught in Scotland by Petrus de Marsiliers at Montrose. This fact counted for much in the progress of the Reformation. Erskine was also drawn towards the new faith, being a close friend of George Wishart, the reformer, from whose fate he was saved by his wealth and influence, and of John Knox, whose advice openly to discountenance the mass was given in the lodgings of the laird of Dun. In the stormy

controversies of the time of Mary Stuart and James VI. Erskine was a conspicuous figure and a moderating influence. He was able to soothe the queen when her feelings had been outraged by Knox's denunciations—being a man "most gentill of nature"—and frequently acted as mediator both between the catholic and reforming parties, and among the reformers themselves. In 1560 he was appointed—though a layman—superintendent of the reformed church of Scotland for Angus and Mearns, and in 1572 he gave his assent to the modified episcopacy proposed by Morton at the Leith convention. Though never himself ordained, he was held in such high esteem by the leaders of the church as to be more than once elected moderator of the general assembly (first in 1564), and he was amongst those who in 1578 drew up the *Second Book of Discipline*. From 1579 he was a member of the king's council. He died in 1591. Erskine owed his peculiar influence among the Scottish reformers to the union—rare in those days—of steadfast convictions with a conciliatory manner; Queen Mary described him as "a mild and sweet-natured man, with true honesty and uprightness."

See the "Dun Papers" in the *Spalding Club Miscellany*, vol. iv. (1849), and the article by T.F. Henderson in the *Dict. Nat. Biog.*

ERSKINE, RALPH (1685-1752), Scottish divine, brother of Ebenezer Erskine (*q.v.*), was born on the 18th of March 1685. After studying at the university of Edinburgh, he was in 1711 ordained assistant minister at Dunfermline. He homologated the protests which his brother laid on the table of the assembly after being rebuked for his synod sermon, but he did not formally withdraw from the establishment till 1737. He was also present, though not as a member, at the first meeting of the associate presbytery. When the severance took place on account of the oath administered to burgesses, he adhered, along with his brother, to the burgher section. He died after a short illness on the 6th of November 1752.

His works consist of sermons, poetical paraphrases and gospel sonnets. The *Gospel Sonnets* have frequently appeared separately. His *Life and Diary*, edited by the Rev. D. Fraser, was published in 1842.

ERSKINE, THOMAS, of Linlathen (1788-1870), Scottish theologian, youngest son of David Erskine, writer to the signet in Edinburgh, and of Anne Graham, of the Grahams of Airth, was born on the 13th of October 1788. He was a descendant of John, 1st or 6th earl of Mar, regent of Scotland in the reign of James VI., a grandson of Colonel John Erskine of Carnock. After being educated at the high school of Edinburgh and at Durham, he attended the literary and law classes at the university of Edinburgh, and becoming in 1810 a member of the Edinburgh faculty of advocates, he for some time enjoyed the intimate acquaintance of Cockburn, Jeffrey, Scott and other distinguished men whose talent then lent lustre to the Scottish bar. In 1816 he succeeded to the family estate of Linlathen, near Dundee, and devoted himself to theology. The writings of Erskine, especially his published letters, are distinguished by a graceful style, and possess originality and interest. His theological views have a considerable similarity to those of Frederick Denison Maurice, who acknowledges having been indebted to him for his first true conception of the meaning of Christ's sacrifice. Erskine had little interest in the "historical criticism" of Christianity, and regarded as the only proper criterion of its truth its conformity or nonconformity with man's spiritual nature, and its adaptability or non-adaptability to man's spiritual needs. He considered the incarnation of Christ as the necessary manifestation to man of an eternal sonship in the divine nature, apart from which those filial qualities which God demands from man could have no sanction; by *faith* as used in Scripture he understood to be meant a certain moral or spiritual activity or energy which virtually implied salvation, because it implied the existence of a principle of spiritual life possessed of an immortal power. This faith, he believed, could be properly awakened only by the manifestation, through Christ, of love as the law of life, and as identical with an eternal righteousness which it was God's purpose to bestow on every individual soul. As an interpreter of the mystical side of Calvinism and of the psychological conditions which correspond with the doctrines of grace Erskine is unrivalled. During the last thirty-three years of his life Erskine ceased from literary work. Among his friends were Madame Vernet, the duchess de Broglie, the younger Mdme de Stael, M. Vinet of Lausanne, Edward Irving, Frederick D. Maurice, Dean Stanley, Bishop Ewing, Dr John Brown and Thomas Carlyle. His wide influence was due to his high character and unassuming earnestness. He died at Edinburgh on the 20th of March 1870.

His principal works are *Remarks on the Internal Evidence for the Truth of Revealed Religion* (1820), an *Essay on Faith* (1822), and the *Unconditional Freeness of the Gospel* (1828). These have all passed through several editions, and have also been translated into French. He is also the author of the *Brazen Serpent* (1831), the *Doctrine of Election* (1839), several "Introductory Essays" to editions of *Christian Authors*, and a posthumous work entitled *Spiritual Order and Other Papers* (1871). Two

vols. of his letters, edited by William Hanna, D.D., with reminiscences by Dean Stanley and Principal Shairp, appeared in 1877.

ERSKINE, THOMAS ERSKINE, 1ST BARON (1750-1823), lord chancellor of England, was the third and youngest son of Henry David, 10th earl of Buchan, and was born in Edinburgh on the 10th of January 1750. From an early age he showed a strong desire to enter one of the learned professions; but his father, owing to his straitened circumstances, was unable to do more than give him a good school education at the high school of Edinburgh and the grammar school of St Andrews. In 1764 he was sent as a midshipman on board the "Tartar," but on finding, when he returned to this country after four years' absence in North America and the West Indies, that there was little immediate chance of his rank of acting lieutenant being confirmed, he quitted the service and entered the army, purchasing a commission in the 1st Royals with the meagre patrimony which had been left to him. But promotion here was as slow as in the navy; while in 1770 he had added greatly to his difficulties by marrying the daughter of Daniel Moore, M.P. for Marlow, an excellent wife, but as poor as himself. However, an accidental visit to an assize court in the town in which he was quartered, and an interview with Lord Mansfield, the presiding judge, confirmed his resolve to quit the army for the law. Accordingly on the 26th of April 1775 he was admitted a student of Lincoln's Inn. He also on the 13th of January following entered himself as a gentleman commoner on the books of Trinity College, Cambridge, but merely that by graduating he might be called two years earlier.

He read in the chambers of Francis Buller (afterwards Mr Justice Buller) and George (afterwards Baron) Wood, and was called to the bar on the 3rd of July 1778. His success was immediate and brilliant. An accident was the means of giving him his first case, *Rex* v. *Baillie*, in which he appeared for Captain Thomas Baillie, the lieutenant-governor of Greenwich hospital, who had published a pamphlet animadverting in severe terms upon the abuses which Lord Sandwich, the first lord of the admiralty, had introduced into the management of the hospital, and against whom a rule had been obtained from the court of king's bench to show cause why a criminal information for libel should not be filed. Erskine was the junior of five counsel; and it was his good fortune that the prolixity of his leaders consumed the whole of the first day, thereby giving the advantage of starting afresh next morning. He made use of this opportunity to deliver a speech of wonderful eloquence, skill and courage, which captivated both the audience and the court. The rule was discharged, and Erskine's fortune was made. He received, it is said, thirty retainers before he left the court. In 1781 he delivered another remarkable speech, in defence of Lord George Gordon—a speech which gave the death-blow to the doctrine of constructive treason. In 1783, when the Coalition ministry came into power, he was returned to parliament as member for Portsmouth. His first speech in the House of Commons was a failure; and he never in parliamentary debate possessed anything like the influence he had at the bar. He lost his seat at the dissolution in the following year, and remained out of parliament until 1790, when he was again returned for Portsmouth. But his success at the bar continued unimpaired. In 1783 he received a patent of precedence. His first special retainer was in defence of Dr W.D. Shipley, dean of St Asaph, who was tried in 1784 at Shrewsbury for seditious libel —a defence to which was due the passing of the Libel Act 1792, laying down the principle that it is for the jury, and not for the judge to decide the question whether or no a publication is a libel. In 1789 he was counsel for John Stockdale, a bookseller, who was charged with seditious libel in publishing a pamphlet in favour of Warren Hastings, whose trial was then proceeding; and his speech on this occasion, probably his greatest effort, is a consummate specimen of the art of addressing a jury. Three years afterwards he brought down the opposition alike of friends and foes by defending Thomas Paine, author of *The Rights of Man*—holding that an advocate has no right, by refusing a brief, to convert himself into a judge. As a consequence he lost the office of attorney-general to the prince of Wales, to which he had been appointed in 1786; the prince, however, subsequently made amends by making him his chancellor. Among Erskine's later speeches may be mentioned those for Horne Tooke and the other advocates of parliamentary reform, and that for James Hadfield, who was accused of shooting at the king. On the accession of the Grenville ministry in 1806 he was made lord chancellor, an office for which his training had in no way prepared him, but which he fortunately held only during the short period his party was in power. Of the remainder of his life it would be well if nothing could be said. Occasionally speaking in parliament, and hoping that he might return to office should the prince become regent, he gradually degenerated into a state of useless idleness. Never conspicuous for prudence, he aggravated his increasing poverty by an unfortunate second marriage.

His first wife had died in 1805, and he married at Gretna Green a Miss Mary Buck. The date of this marriage is not definitely known. Once only—in his conduct in the case of Queen Caroline—does he recall his former self. He died at Almondell, Linlithgowshire, on the 17th of November 1823, of pneumonia, caught on the voyage to Scotland.

Erskine's great forensic reputation was, to a certain extent, a concomitant of the numerous political trials of the day, but it was also due to his impassioned eloquence and undaunted courage, which so often carried audience and jury and even the court along with him. As a judge he did not succeed; and it has been questioned whether under any circumstances he could have succeeded. For the office

of chancellor he was plainly unfit. As a lawyer he was well read, but by no means profound. His strength lay in the keenness of his reasoning faculty, in his dexterity and the ability with which he disentangled complicated masses of evidence, and above all in his unrivalled power of fixing and commanding the attention of juries. To no department of knowledge but law had he applied himself systematically, with the single exception of English literature, of which he acquired a thorough mastery in early life, at intervals of leisure in college, on board ship, or in the army. Vanity is said to have been his ruling personal characteristic; but those who knew him, while they admit the fault, say that in him it never took an offensive form, even in old age, while the singular grace and attractiveness of his manner endeared him to all with whom he came in contact.

By his first wife he had four sons and four daughters. His eldest son, David Montagu (1776-1855), was a well-known diplomatist; his second son, Henry David (1786-1859), was dean of Ripon; and his third son, Thomas (1788-1864), became a judge of the court of common pleas. By his second wife he had one son, born in 1821.

In 1772 Erskine published *Observations on the Prevailing Abuses in the British Army*, a pamphlet which had a large circulation, and in later life, *Armata*, an imitation of *Gulliver's Travels*. His most noted speeches have repeatedly appeared in a collected form. See Campbell's *Lives of the Chancellors*; Moore's *Diaries*; Fergusson's *Henry Erskine* (1882); Dumerit's *Henry Erskine, a Study* (Paris, 1883); Lord Brougham's *Memoir*, prefixed to Erskine's *Speeches* (1847); Romilly's *Memoirs*; the *Croker Papers*; Lord Holland's *Memoirs*.

ERUBESCITE, a native copper-iron sulphide, Cu_5FeS_4, of importance as an ore of copper. It crystallizes in the cubic system, the usual form being that of interpenetrating cubes twinned on an octahedral plane. The faces are usually curved and rough, and the crystals confusedly aggregated together. Compact and granular masses are of more frequent occurrence. The colour on a freshly fractured surface is bronzy or coppery, but in moist air this rapidly tarnishes with iridescent blue and red colours; hence the names purple copper ore, variegated copper ore (Ger. *Buntkupfererz*), horse-flesh ore, and erubescite (from the Lat. *erubescere*, "to grow red"). The lustre is metallic, and the streak greyish-black; hardness 3; sp. gr. 5.0. Bornite (after Baron Ignaz von Born, b. 1742, d. 1791) is a name in common use for this mineral, and it predates erubescite, the name given by J.D. Dana in 1850, but afterwards rejected by him; French authors use the name phillipsite, after the English mineralogist, R. Phillips, who analysed the mineral; both these earlier names had, however, been previously used for other minerals.

Owing to the frequent presence of mechanically admixed chalcopyrite and chalcocite, the published analyses of erubescite show wide variations, the copper, for example, varying from 50 to 70%. Even the best Cornish crystals enclose a nucleus of chalcopyrite ($CuFeS_2$), and an analysis of these made in 1839 led to the long-accepted formula Cu_3FeS_3. Recently, B.J. Harrington has analysed carefully selected material and obtained the formula Cu_5FeS_4.

Erubescite occurs in copper-bearing veins, and has been mined as an ore of copper at Redruth in Cornwall, Montecatini in the province of Pisa, Tuscany, Bristol in Connecticut, Acton in Canada, and other localities in North America. The best crystallized specimens are from the Carn Brea mine and other copper mines in the neighbourhood of Redruth, and from Bristol in Connecticut. Recently a few large isolated crystals with the form of icositetrahedra have been found with calcite and albite in a gold-vein on Frossnitz-Alpe in the Gross-Venediger, Tirol.

(L. J. S.)

ERYSIPELAS (a Greek word, probably derived from ἐρυθρός, red, and πέλλα, skin)—synonyms, *the Rose*, *St Anthony's Fire*—an acute contagious disease, characterized by a special inflammation of the skin, caused by a streptococcus. Erysipelas is endemic in most countries, and epidemic at certain seasons, particularly the spring of the year. The poison is not very virulent, but it certainly can be conveyed by bedding and the clothes of a third person. Two varieties are occasionally described, a traumatic and an idiopathic, but the disease seems to depend in all cases upon the existence of a wound or abrasion. In the so-called idiopathic variety, of which *facial erysipelas* is the best known, the point of entry is probably an abrasion by the lachrymal duct.

When the erysipelas is of moderate character there is simply a redness of the integument, which feels somewhat hard and thickened, and upon which there often appear small vesications. This redness, though at first circumscribed, tends to spread and affect the neighbouring sound skin, until an entire limb or a large area of the body may become involved in the inflammatory process. There is usually considerable pain, with heat and tingling in the affected part. As the disease advances the

portions of skin first attacked become less inflamed, and exhibit a yellowish appearance, which is followed by slight desquamation of the cuticle. The inflammation in general gradually disappears. Sometimes, however, it breaks out again, and passes over the area originally affected the second time. But besides the skin, the subjacent tissues may become involved in the inflammation, and give rise to the formation of pus. This is termed *phlegmonous erysipelas*, and is much more apt to occur in connexion with the traumatic variety of the disease. Occasionally the affected parts become gangrenous. Certain complications are apt to arise in erysipelas affecting the surface of the body, particularly inflammation of serous membranes, such as the pericardium or pleura.

Erysipelas of the face usually begins with symptoms of general illness, the patient feeling languid, drowsy and sick, while frequently there is a distinct rigor followed with fever. Sore throat is sometimes felt, but in general the first indication of the local affection is a red and painful spot at the side of the nose or on one of the cheeks or ears. Occasionally it would appear that the inflammation begins in the throat, and reaches the face through the nasal fossae. The redness gradually spreads over the whole surface of the face, and is accompanied with swelling, which in the lax tissues of the cheeks and eyelids is so great that the features soon become obliterated and the countenance wears a hideous expression. Advancing over the scalp, the disease may invade the neck and pass on to the trunk, but in general the inflammation remains confined to the face and head. While the disease progresses, besides the pain, tenderness and heat of the affected parts, the constitutional symptoms are very severe. The temperature rises often to 105° or higher, remains high for four or five days, and then falls by crisis. Delirium is a frequent accompaniment. The attack in general lasts for a week or ten days, during which the inflammation subsides in the parts of the skin first attacked, while it spreads onwards in other directions, and after it has passed away there is, as already observed, some slight desquamation of the cuticle.

Although in general the termination is favourable, serious and occasionally fatal results follow from inflammation of the membranes of the brain, and in some rare instances sudden death has occurred from suffocation arising from oedema glottidis, the inflammatory action having spread into and extensively involved the throat. One attack of this disease, so far from protecting from, appears rather to predispose to others. It is sometimes a complication in certain forms of exhausting disease, such as phthisis or typhoid fever, and is then to be regarded as of serious import. A very fatal form occasionally attacks new-born infants, particularly in the first four weeks of their lives. In epidemics of puerperal fever this form of erysipelas has been specially found to prevail.

The treatment of erysipelas is best conducted on the expectant system. The disease in most instances tends to a favourable termination; and beyond attention to the condition of the stomach and bowels, which may require the use of some gentle laxative, little is necessary in the way of medicine. The employment of preparations of iron in large doses is strongly recommended by many physicians. But the chief point is the administration of abundant nourishment in a light and digestible form. Of the many local applications which may be employed, hot fomentations will be found among the most soothing. Dusting the affected part with powdered starch, and wrapping it in cotton wadding, is also of use.

In the case of phlegmonous erysipelas complicating wounds, free incisions into the part are necessary.

ERYTHRAE [mod. *Litri*], one of the Ionian cities of Asia Minor, situated on a small peninsula stretching into the Bay of Erythrae, at an equal distance from the mountains Mimas and Corycus, and directly opposite the island of Chios. In the peninsula excellent wine was produced. The town was said to have been founded by Ionians under Knopos, son of Codrus. Never a large city, it sent only eight ships to the battle of Lade. The Erythraeans owned for a considerable time the supremacy of Athens, but towards the close of the Peloponnesian war they threw off their allegiance to that city. After the battle of Cnidus, however, they received Conon, and paid him honours in an inscription, still extant. Erythrae was the birthplace of two prophetesses—one of whom, Sibylla, is mentioned by Strabo as living in the early period of the city; the other, Athenais, lived in the time of Alexander the Great. The ruins include well-preserved Hellenistic walls with towers, of which five are still visible. The acropolis (280 ft.) has the theatre on its N. slope, and eastwards lie many remains of Byzantine buildings. Modern Litri is a considerable place and port, extending from the ancient harbour to the acropolis. The smaller coasting steamers call, and there is an active trade with Chios and Smyrna.

ERYTHRITE, the name given to (1) a mineral composed of a hydrated cobalt arsenate, and (2) in chemistry, a tetrahydric alcohol. (1) The mineral erythrite has the formula $Co_3(AsO_4)_2 \cdot 8H_2O$, and

crystallizes in the monoclinic system and is isomorphous with vivianite. It sometimes occurs as beautiful radially-arranged groups of blade-shaped crystals with a bright crimson colour and brilliant lustre. On exposure to light the colour and lustre deteriorate. There is a perfect cleavage parallel to the plane of symmetry, on which the lustre is pearly. Cleavage flakes are soft (H = 2), sectile and flexible; specific gravity 2.95. The mineral is, however, more often found as an earthy encrustation with a peach-blossom colour, and in this form was early (1727) known as cobalt-bloom (Ger. *Kobaltblüthe*). The name erythrite, from ἐρυθρός, "red," was given by F.S. Beudant in 1382. Erythrite occurs as a product of alteration of smaltite ($CoAs_2$) and other cobaltiferous arsenides. The finest crystallized specimens are from Schneeberg in Saxony. The earthy variety has been found in Thuringia and Cornwall and some other places. (2) The alcohol erythrite has the constitutional formula $HO{\cdot}H_2C{\cdot}CH(OH){\cdot}CH(OH){\cdot}CH_2OH$; it is also known as erythrol, erythroglucin and phycite. It corresponds to tartaric acid, and, like this substance, it occurs in four stereo-isomeric forms. The internally compensated modification, *i*-erythrite, corresponding to mesotartaric acid, occurs free in the algae *Protococcus vulgaris*, and as the orsellinate, erythrin, $C_4H_6(OH)_2(O{\cdot}C_8H_7O_3)_2$, in many lichens and algae, especially *Roccella montagnei*. It has a sweet taste, melts at 126°, and boils at 330°. Careful oxidation with dilute nitric acid gives erythrose or tetrose, which is probably a mixture of a trioxyaldehyde and trioxyketone. Energetic oxidation gives erythritic acid and mesotartaric acid. *i*-Erythrite and the racemic mixture of the dextro and laevo varieties were synthesized by Griner in 1893 from divinyl.

ERZERUM, or Arzrum (Arm. *Garin*), the chief town of an important vilayet of the same name in Asiatic Turkey. It is a military station and a fortress of considerable strategical value, closing the roads from Kars, Olti and other parts of the frontier. Several important routes from Trebizond and various parts of Anatolia converge towards it from the west. It is situated at the eastern end of an open bare plain, 30 m. long and about 12 wide, bordered by steep, rounded mountains and traversed by the Kara Su, or western Euphrates, which has its source in the Dumlu Dagh a few miles north of that town, which lies at an elevation of 6250 ft. above sea-level, while the near hills rise to 10,000 ft. The scenery in the neighbourhood is striking, lofty bare mountains being varied by open plains and long valleys dotted with villages. Just east of the town is the broad ridge of the Deveboyun ("Camel's Neck"), across which the road passes to Kars. To the south is the Palanduken range, from which emerge numerous streams, supplying the town with excellent water. In the plain to the north the Kara Su traverses extensive marshes which afford good wildfowl-shooting in the spring.

The town is surrounded by an earthen enceinte or rampart with some forts on the hills just above it, and others on the Deveboyun ridge facing east, the whole forming a position of considerable strength. The old walls and the citadel have disappeared. Inside the ramparts the town lies rather cramped, with narrow, crooked streets, badly drained and dirty; the houses are generally built of dark grey volcanic stone with flat roofs, the general aspect, owing to the absence of trees, being somewhat gloomy. The water-supply from Palanduken is distributed by wooden pipes to numerous public fountains. The town has a population of about 43,000, including about 10,000 Armenians, 2000 Persians and a few Jews. It has a garrison in peace of about 5000 men. It is the seat of the British consulate for Kurdistan, and there are other European consulates besides an American mission with schools. The great altitude accounts for very severe winter cold, occasionally 10° to 25° below zero F., accompanied by blizzards (*tipi*) sometimes fatal to travellers overtaken by them. The summer heat is moderate (59° to 77°).

There are several well-built mosques (none older than the 16th century), public baths, and several good khans. There are Armenian and Catholic churches, but the most beautiful building is a *medresse* erected in the 12th century by the Seljuks, with ornamental doorway and two graceful minarets known as the *Chifte Minare*.

Situated on the main road from Trebizond into north-west Persia, the town has always a large caravan traffic, principally of camels, but since the improvement of communications in Russia this has declined. A good carriage-road leads to the coast at Trebizond, the journey being made in five or six days. There are also roads to Kars, Bayazid, Erzingan and Kharput. Blacksmiths' and coppersmiths' work is better here than in most Turkish towns; horse-shoes and brasswork are also famous. There are several tanneries, and Turkish boots and saddles are largely made. Jerked beef (*pasdirma*) is also prepared in large quantities for winter use. The plain produces wheat, barley, millet and vegetables. Wood fuel is scarce, the present supply being from the Tortum district, whence surface coal and lignite are also brought; but the usual fuel is *tezek* or dried cow-dung. The bazaars are of no great interest. Good Persian carpets and similar goods can be obtained.

Erzerum is a town of great antiquity, and has been identified with the Armenian Garin Kalakh, the Arabic Kalikale, and the Byzantine Theodosiopolis of the 5th century, when it was a frontier fortress of the empire—hence its name *Erzen-er-Rum*. It was captured by the Seljuks in 1201, when it was an important city, and it fell into Turkish possession in 1517. In July 1829 it was captured by the Russian general Paskevich, and the occupation continued until the peace of Adrianople (September 1829).

The town was unsuccessfully attacked by the Russians on the 9th of November 1877 after a victory gained by them a short time previously on the Deveboyun heights; it was occupied by them during the armistice (7th of February 1878) and restored to Turkey after the treaty of Berlin. In 1859 a severe earthquake destroyed much of the town, and another in November 1901 caused much damage.

The Erzerum vilayet extends from the Persian frontier at Bayazid, all along the Russian frontier and westward into Anatolia at Baiburt and Erzingan. It is divided into the three sanjaks of Bayazid, Erzerum, and Erzingan. It includes the highest portion of the Armenian plateau, and consists of bare undulating uplands varied by lofty ranges. The deep gorges of the Chorokh and Tortum streams north of the town alone have a different appearance, being well wooded in places. Both arms of the Euphrates have their rise in this country as well as the Aras (Araxes) and the Chorokh (Acampsis). It is an agricultural country with few industries. Besides forests, iron, salt, sulphur and other mineral springs are found. Some of the coal and lignite mines in Tortum have been recently worked to supply fuel for Erzerum. The population is largely Armenian and Kurd with some Turks (Moslems 500,000, Christians 140,000).

(C. W. W.; F. R. M.)

ERZGEBIRGE, a mountain chain of Germany, extending in a W.S.W. direction from the Elbe to the Elstergebirge along the frontier between Saxony and Bohemia. Its length from E.N.E. to W.S.W. is about 80 m., and its average breadth about 25 m. The southern declivity is generally steep and rugged, forming in some places an almost perpendicular wall of the height of from 2000 to 2500 ft.; while the northern, divided at intervals into valleys, sometimes of great fertility and sometimes wildly romantic, slopes gradually towards the great plain of northern Germany. The central part of the chain forms a plateau of an average height of more than 3000 ft. At the extremities of this plateau are situated the highest summits of the range:—in the south-east the Keilberg (4080 ft.); in the north-east the Fichtelberg (3980 ft.); and in the south-west the Spitzberg (3650 ft.). Between the Keilberg and the Fichtelberg, at the height of about 3300 ft., is situated Gottesgab, the highest town in Bohemia. Geologically, the Erzgebirge range consists mainly of gneiss, mica and phyllite. As its name (Ore Mountains) indicates, it is famous for its mineral ores. These are chiefly silver and lead, the layers of both of which are very extensive, tin, nickel, copper and iron. Gold is found in several places, and some arsenic, antimony, bismuth, manganese, mercury and sulphur. The Erzgebirge is celebrated for its lace manufactures, introduced by Barbara Uttmann in 1541, embroideries, silk-weaving and toys. The climate is in winter inclement in the higher elevations, and, as the snow lies deep until the spring, the range is largely frequented by devotees of winter sport, ski, toboganning, &c. In summer the air is bracing, and many climatic health resorts have sprung into existence, among which may be mentioned Kipsdorf, Bärenfels and Oberwiesenthal. Communication with the Erzgebirge is provided by numerous lines of railway, some, such as that from Freiberg to Brüx, that from Chemnitz to Komotau, and that from Zwickau to Carlsbad, crossing the range, while various local lines serve the higher valleys.

The Elstergebirge, a range some 16 m. in length, in which the Weisse Elster has its source, runs S.W. from the Erzgebirge to the Fichtelgebirge and attains a height of 2630 ft.

See Grohmann, *Das Obererzgebirge und seine Städte* (1903), and Schurtz, *Die Pässe des Erzgebirges* (1891); also Daniel, *Deutschland*, vol. ii., and Gebauer, *Länder und Völkerkunde*, vol. i.

ERZINGAN, or Erzinjan (*Arsinga* of the middle ages), the chief town of a sanjak in the Erzerum vilayet of Asiatic Turkey. It is the headquarters of the IV. army corps, being a place of some military importance, with large barracks and military factories. It is situated at an altitude of 3900 ft., near the western end of a rich well-watered plain through which runs the Kara Su or western Euphrates. It is surrounded by orchards and gardens, and is about a mile from the right bank of the river, which here runs in two wide channels crossed by bridges. One wide street traverses the town from east to west, but the others are narrow, unpaved and dirty, except near the new government buildings and the large modern mosque of Hajji Izzet Pasha to the north, which are the only buildings of note. The principal barracks, military hospital and clothing factory are at Karateluk on the plain and along the foot-hills to the north 3 m. off, one recent addition to the business buildings having electric power and modern British machinery; some older barracks and a military tannery and boot factory being in the town. The population numbers about 15,000, of whom about half are Armenians living in a separate quarter. The principal industries are the manufacture of silk and cotton and of copper dishes and utensils. The climate is hot in summer but moderate in winter. A carriage-road leads to Trebizond, and other roads to Sivas, Karahissar, Erzerum and Kharput. The plain, almost surrounded

by lofty mountains, is highly productive with many villages on it and the border hills. Wheat, fruit, vines and cotton are largely grown, and cattle and sheep are bred. Water is everywhere abundant, and there are iron and hot sulphur springs. The battle in which the sultan of Rum (1243) was defeated by the Mongols took place on the plain, and the celebrated Armenian monastery of St Gregory, "the Illuminator," lies on the hills 11 m. S.W. of the town.

Erzingan occupies the site of an early town in which was a temple of Anaitis. It was an important place in the 4th century when St Gregory lived in it. The district passed from the Byzantines to the Seljuks after the defeat of Romanus, 1071, and from the latter to the Mongols in 1243. After having been held by Mongols, Tatars and Turkomans, it was added to the Osmanli empire by Mahommed II. in 1473. In 1784 the town was almost destroyed by an earthquake.

(C. W. W.; F. R. M.)

ESAR-HADDON [Assur-akhi-iddina, "Assur has given a brother"], Assyrian king, son of Sennacherib; before his accession to the throne he had also borne another name, Assur-etil-ilani-yukin-abla. At the time of his father's murder (the 20th of Tebet, 681 B.C.) he was commanding the Assyrian army in a war against Ararat. The conspirators, after holding Nineveh for 42 days, had been compelled to fly northward and invoke the aid of the king of Ararat. On the 12th of Iyyar (680 B.C.) a decisive battle was fought near Malatia, in which the veterans of Assyria won the day, and at the close of it saluted Esar-haddon as king. He returned to Nineveh, and on the 8th of Sivan was crowned king. A good general, Esar-haddon was also an able and conciliatory administrator. His first act was to crush a rebellion among the Chaldaeans in the south of Babylonia and then to restore Babylon, the sacred city of the West, which had been destroyed by his father. The walls and temple of Bel were rebuilt, its gods brought back, and after his right to rule had been solemnly acknowledged by the Babylonian priesthood Esar-haddon made Babylon his second capital. A year or two later Media was invaded and Median chiefs came to Nineveh to offer homage to their conqueror. He now turned to Palestine, where the rebellion of Abdi-milkutti of Zidon was suppressed, its leader beheaded, and a new Zidon built out of the ruins of the older city (676-675 B.C.). All Palestine now submitted to Assyria, and 12 Syrian and 10 Cyprian princes (including Manasseh of Judah) came to pay him homage and supply him with materials for his palace at Nineveh. But a more formidable enemy had appeared on the Assyrian frontier (676 B.C.). The Cimmerii (see SCYTHIA) under Teuspa poured into Asia Minor; they were, however, overthrown in Cilicia, and the Cilician mountaineers who had joined them were severely punished. It was next necessary to secure the southern frontier of the empire. Esar-haddon accordingly marched into the heart of Arabia, to a distance of about 900 m., across a burning and waterless desert, and struck terror into the Arabian tribes. At last he was free to complete the policy of his predecessors by conquering Egypt, which alone remained to threaten Assyrian dominion in the West. Baal of Tyre had transferred his allegiance from Esar-haddon to the Egyptian king Tirhaka and opened to the latter the coast road of Palestine; leaving a force, therefore, to invest Tyre, Esar-haddon led the main body of the Assyrian troops into Egypt on the 5th of Adar, 673 B.C. The desert was crossed with the help of the Arabian sheikh. Egypt seems to have submitted to the invader and was divided into twenty satrapies. Another campaign, however, was needed before it could be finally subdued. In 670 B.C. Esar-haddon drove the Egyptian forces before him in 15 days (from the 3rd to the 18th of Tammuz) all the way from the frontier to Memphis, thrice defeating them with heavy loss and wounding Tirhaka himself. Three days after Memphis fell, and this was soon afterwards followed by the surrender of Tyre and its king. In 668 B.C. Egypt again revolted, and while on the march to reduce it Esar-haddon fell ill and died on the 10th of Marchesvan. His empire was divided between his two sons Assur-bani-pal and Samas-sum-yukin, Assur-bani-pal receiving Assyria and his brother Babylonia, an arrangement, however, which did not prove to be a success. Esar-haddon was the builder of a palace at Nineveh as well as of one which he erected at Calah for Assur-bani-pal.

AUTHORITIES.—E.A.W. Budge, *History of Esarhaddon* (1880); E. Schrader, *Keilinschriftliche Bibliothek*, ii. (1889) (Abel and Winckler in ii. pp. 120-153); G. Maspero, *Passing of the Empires*, pp. 345 sqq.; F. von Luschan, "Ausgrabungen in Sendschirli," i. (*Mitteilungen aus den orientalischen Sammlungen*, 1893).

(A. H. S.)

ESAU, the son of Isaac and Rebecca, in the Bible, and the elder twin brother of Jacob. He was so called because he was red (*admōnī*) and hairy when he was born, and the name Edom (red) was given to him when he sold his birthright to Jacob for a meal of *red* lentil pottage (Gen. xxv. 21-34). Another story of the manner in which Jacob obtained the superiority is related in Gen. xxvii. Here the younger brother impersonated the elder, and succeeded in deceiving his blind father by imitating the

hairiness of his brother. He thus gained the blessing intended for the first-born, and Esau, on hearing how he had been forestalled, vowed to kill him. Jacob accordingly fled to his mother's relatives, and on his return, many years later, peace was restored between them (xxxii. sq.). These primitive stories of the relations between the eponymous heads of the Edomites and Israelites are due to the older (Judaean) sources; the late notices of the Priestly school (see GENESIS) preserve a different account of the parting of the two (Gen. xxxvi. 6-8), and lay great stress upon Esau's marriages with the Canaanites of the land, unions which were viewed (from the writer's standpoint) with great aversion (Gen. xxvi. 34 sq., xxvii. 46). For "Esau" as a designation of the Edomites, cf. Jer. xlix. 8, Obad. *vv.* 6, 8, and on their history, see EDOM.

Esau's characteristic hairiness (Gen. xxv. 25, xxvii. 11) has given rise to the suggestion that his name is properly *'ēshav*, from a root corresponding to the Arab. *'athiya*, to have thick or matted hair. Mt Seir, too, where he resided, etymologically suggests a "shaggy" mountain-land. According to Hommel (*Sud-arab. Chrestom.* p. 39 sq.) the name Esau has S. Arabian analogies. On the possible identity of the name with Usoos, the Phoenician demi-god (Philo of Byblus, ap. Eusebius, *Praep. Evang.* i. 10), see Cheyne, *Encyc. Bib.* col. 1333; Lagrange, *Études sur les religions sémitiques*, p. 416 (Paris, 1905); Ed. Meyer, *Israeliten*, 278 sq. (and, on general questions, *ib.* 128 sq., 329 sqq.).

(S. A. C.)

ESBJERG, a seaport of Denmark in the *amt* (county) of Ribe, 18 m. from the German frontier on the west coast of Jutland. It has railway communication with the east and north of Jutland, and with Germany. It was granted municipal rights in 1900, having grown with astonishing rapidity from 13 inhabitants in 1868 to 13,355 in 1901. This growth it owes to the construction of a large harbour in 1868-1888. It is the principal outlet westward for S. Jutland; exports pork and meat, butter, eggs, fish, cattle and sheep, skins, lard and agricultural seeds, and has regular communication with Harwich and Grimsby in England. Three miles S.E. is Nordby on the island of Fanö, the northernmost of the North Frisian chain. It is an arid bank of heathland and dunes, but both Nordby and Sönderho in the south are frequented as seaside resorts. The former has a school of navigation. The fisheries are valuable.

ESCANABA, a city and the county-seat of Delta county, Michigan, U.S.A., on Little Bay de Noquette, an inlet of Green Bay, about 60 m. S. of Marquette. Pop. (1890) 6808; (1900) 9549, of whom 3214 were foreign-born; (1910 census) 13,194. It is served by the Chicago & North-Western and the Escanaba & Lake Superior railways. It is built on a picturesque promontory which separates the waters of Green Bay from Little Bay de Noquette, and its delightful summer climate, wild landscape scenery and facilities for boating and trout fishing make it a popular summer resort. Escanaba has a water front of 8 m., and is an important centre for the shipment of iron-ore, for which eight large and well-equipped docks are provided—there is an ore-crushing plant here; considerable quantities of lumber and fish are also shipped, and furniture, flooring (especially of maple) and wooden ware (butter-dishes and clothes-pins) are manufactured. There is a large tie-preserving plant here. Good water power is supplied by the Escanaba river. Escanaba was settled in 1863, was incorporated as a village in 1883, and was first chartered as a city in the same year.

ESCAPE (in mid. Eng. *eschape* or *escape*, from the O. Fr. *eschapper*, modern *échapper*, and *escaper*, low Lat. *escapium*, from *ex*, out of, and *cappa*, cape, cloak; cf. for the sense development the Gr. ἐκδύεσθαι, literally to put off one's clothes, hence to slip out of, get away), a verb meaning to get away from, especially from impending danger or harm, to avoid capture, to regain one's liberty after capture. As a substantive, "escape," in law, is the regaining of liberty by one in custody contrary to due process of law. Such escape may be by force, if out of prison it is generally known as "prison-breach" or "prison-breaking," or by the voluntary or negligent act of the custodian. Where the escape is caused by the force or fraud of others it is termed "rescue" (*q.v.*). "Escape" is used in botany of a cultivated plant found growing wild. The word is also used of a means of escape, *e.g.* "fire-escape," and of a loss or leakage of gas, current of electricity or water.

ESCHATOLOGY (Gr. ἔσχατος, last, and λόγος, science; the "doctrine of last things"), a theological term derived from the New Testament phrases "the last day" (ἐν τῇ ἐσχάτῃ ἡμέρᾳ, John vi. 39), "the last times" (ἐπ᾽ ἐσχάτων τῶν χρόνων, 1 Peter i. 20), "the last-state" (τὰ ἔσχατα, Matt. xii. 45), a conception taken over from ancient prophecy (Is. ii. 2; Mal. iv. 1). It was the common belief in the apostolic age that the second advent of Christ was near, and would give the divine completion to the world's history. The use of the term, however, has been extended so as to include all that is taught in the Scriptures about the future life of the individual as well as the final destiny of the world. The reasons for the belief in a life after death are discussed in the article Immortality. The present article, after a brief glance at the conceptions of the future of the individual or the world found in other religions, will deal with the teaching of the Old and New Testaments, the Jewish and the Christian Church regarding the hereafter.

There is a bewildering variety in the views of the future life and world held by different peoples. The future life may be conceived as simply a continuation of the present life in its essential features, although under conditions more or less favourable. It may also be thought of as retributive, as a reversal of present conditions so that the miserable are comforted, and the prosperous laid low, or as a reward or punishment for good or evil desert here. Personal identity may be absorbed, as in the transmigration of souls, or it may even be denied, while the good or bad result of one life is held to determine the weal or woe of another. The scene of the future life may be thought of on earth, in some distant part of it, or above the earth, in the sky, sun, moon or stars, or beneath the earth. The abodes of bliss and the places of torment may be distinguished, or one last dwelling-place may be affirmed for all the dead. Sometimes the good find their abiding home with the gods; sometimes a number of heavens of varying degrees of blessedness is recognized (see F.B. Jevons, *An Introduction to the History of Religion*, chs. xxi. and xxii., 1902; and J.A. MacCulloch's *Comparative Theology*, xiv., 1902).

Eastern Religions.

(1) Confucius, though unwilling to discuss any questions concerning the dead, by approving ancestor-worship recognized a future life. (2) Taoism promises immortality as the reward of merit. (3) *The Book of the Dead*—a guide-book for the departed on his long journey in the unseen world to the abode of the blessed—shows the attention the Egyptian religion gave to the state of the dead. (4) Although the Babylonian religion presents a very gloomy view of the world of the dead, it is not without a few faint glimpses of a hope that a few mortals at least may gain deliverance from the dread doom. (5) A characteristic feature of Indian thought is the transmigration of the soul from one mode of life to another, the physical condition of each being determined by the moral and religious character of the preceding. But deliverance from this cycle of existences, which is conceived as misery, is promised by means of speculation and asceticism. Denying the continuance of the soul, Buddhism affirmed a continuity of moral consequences (*Karma*), each successive life being determined by the total moral result of the preceding life. Its doctrine of salvation was a guide to, if not absolute non-existence, yet cessation of all consciousness of existence (*Nirvana*). Later Buddhism has, however, a doctrine of many heavens and hells. (6) In Zoroastrianism not only was continuance of life recognized, but a strict retribution was taught. Heaven and hell were very clearly distinguished, and each soul according to its works passed to the one or to the other. But this faith did not concern itself only with the future lot of the individual soul. It was also interested in the close of the world's history, and taught a decisive, final victory of Ormuzd over Ahriman, of the forces of good over the forces of evil. It is not at all improbable that Jewish eschatology in its later developments was powerfully influenced by the Persian faith. (7) Mahommedanism reproduces and exaggerates the lower features of popular Jewish and Christian eschatology (see the separate articles on these religions).

Old Testament.

In the Old Testament we can trace the gradual development of an ever more definite doctrine of "the final condition of man and the world." This is regarded as the last stage in a moral process, a redemptive purpose of God. The eschatology of the Old Testament is thus closely connected with, but not limited by, Messianic hope, as there are eschatological teachings that are not Messianic. As the Old Testament revelation is concerned primarily with the elect nation, and only secondarily (in the later writings) with the individual persons composing it, we follow the order of importance as well as of time in dealing first with the people. The universalism which marks the promise to the seed of the woman (Gen. iii. 15) appears also in the blessing of Noah (ix. 25). In the promise to Abraham (xii. 3) this universal good is directly related to God's particular purpose for His chosen people; so also in the blessing of Jacob (xlix.) and of Moses (Deut. xxxiii.). David's last words (2 Sam. xxiii.) blend together his desire that his family should retain the kingship, and his aspiration for a kingdom of righteousness on earth. The conception of the "Day of the Lord" is frequent and prominent in the prophets, and the sense given to the phrase by the people and by the prophets throws into bold relief the contrast between popular beliefs and the prophetic faith. The people simply expected deliverance from their miseries and burdens by the intervention of Yahweh, because He had chosen Israel for His people. The prophets had an ethical conception of Yahweh; the sin of His own people and of other nations called for His intervention in judgment as the moral ruler of the world. But judgment they conceived as preparing for redemption. The day of the Lord is always an eschatological conception, as the term is applied to the final and universal judgment, and not to any less decisive intervention of God in the course of human history. In the pre-exilic prophets the judgment of God is "primarily on Israel, although it also embraces the nations"; during the Exile and at the Restoration the judgment is represented as falling on the nations while redemption is being wrought for God's people; after the Restoration the people

of God is again threatened, but still the warning of judgment is mainly directed towards the nations and deliverance is promised to Israel. As the manifestation of God in grace as well as judgment, the day of the Lord will bring joy to Israel and even to the world. As a day of judgment it is accompanied by terrible convulsions of nature (not to be taken figuratively, but probably intended literally by the prophets in accordance with their view of the absolute subordination of nature to the divine purpose for man). It ushers in the Messianic age. While the moral issues are finally determined by this day, yet the world of the Messianic age is painted with the colours of the prophet's own surroundings. Israel is restored to its own land, and to it the other nations are brought into subjugation, by force or persuasion. The contributions of the Old Testament to Christian eschatology embrace these features: "(1) The manifestation or advent of God; (2) the universal judgment; (3) behind the judgment the coming of the perfect kingdom of the Lord, when all Israel shall be saved and when the nations shall be partakers of their salvation; and (4) the finality and eternity of this condition, that which constitutes the blessedness of the saved people being the Presence of God in the midst of them—this last point corresponding to the Christian idea of heaven" (A.B. Davidson, in Hastings's *Bible Dictionary*, i. p. 738). This hope is for the people on this earth though transfigured.

To the individual it would seem at first only old age is promised (Is. lxv. 20; Zech. viii. 4), but the abolition of death itself is also declared (Is. xxv. 8). The resurrection, which appears at first as a revival of the dead nation (Hos. vi. 2; Ez. xxxvii. 12-14), is afterwards promised for the pious individuals (Is. xxvi. 19), so that they too may share in the national restoration. Only in Daniel xii. 2 is taught a resurrection of the wicked "to shame and everlasting contempt" as well as of the righteous to "everlasting life." It was only at the Exile, when the nation ceased to be, that the worth of the individual came to be recognized, and the hopes given to the nation were claimed for the individual. In dealing with the individual eschatology we must carefully distinguish the popular ideas regarding death and the hereafter which Israel shared with the other Semitic peoples, from the intuitions, inferences, aspirations evoked in the pious by the divine revelation itself. The former have not the moral significance or the religious value of the latter. The starting-point of the development was the common belief that the dead continued to exist in an unsubstantial mode of life, but cut off from fellowship with God and man; but faith left this far behind. Sheol is the common abode of the righteous and the ungodly: life there is shadowy and feeble, but seems to continue in a wavering and dim reflection features of this life. As the present life is, however, determined by moral issues, and as death does not change man's relation to God, moral considerations could not be absolutely excluded from the future life. A forward step had to be taken. Pious men, in fellowship with God, when they faced the fact of death, were led either to challenge its right, or to give a new meaning to it. Either there was a protest against death itself, and a demand for immortality (Ps. xvi. 9-11), or death was conceived as something different for the saint and for the sinner; fellowship with God would not and could not be interrupted (Ps. xlix. 14, 15, lxxiii. 17-28). The vision of God is anticipated after death's sleep (Ps. xvii. 15; Job xix. 25-27). This belief in individual immortality is expressed poetically and obscurely: it is later than the eschatology of the people. It assumes the moral distinction of the righteous and the ungodly, and seeks a solution for the problem of the lack of harmony of present character and condition. Its deepest motive, however, is religious. The soul once in fellowship with God cannot even by death be separated from God. The individual hoped that he would live to share the nation's good, and thus the two streams of Old Testament eschatology at last flow together.

Apocryphal and Apocalyptic books.

It is in the apocryphal and apocalyptic literature of Judaism that the fullest development of eschatology can be traced. Four words may serve to express the difference of the doctrine of these writings and the teaching of the Old Testament. Eschatology was *universalized* (God was recognized as the creator and moral governor of all the world), *individualized* (God's judgment was directed, not to nations in a future age, but to individuals in a future life), *transcendentalized* (the future age was more and more contrasted with the present, and the transition from the one to the other was not expected as the result of historical movements, but of miraculous divine acts), and *dogmatized* (the attempt was made to systematize in some measure the vague and varied prophetic anticipations). Only a very brief summary of the conceptions current in these writings can be given. The coming of the Messiah will be preceded by the Last Woes. The Messiah is very variously conceived: (1) "a passive, though supreme member of the Messianic Kingdom"; (2) "an active warrior who slays his enemies with his own hand"; (3) "one who slays his enemies by the word of his mouth, and rules by virtue of his justice, faith and holiness"; (4) a supernatural person, "eternal Ruler and Judge of Mankind" (R.H. Charles in Hastings's *Bible Dictionary*, i. p. 748). In some of the writings no Messianic kingdom is looked for; in others only a temporal duration on earth is assigned to it; in others still it abides for ever either on earth as it is, or on earth transformed. The dispersion among the nations is to return home. Sometimes the Resurrection is narrowed down to the resurrection of the righteous, at others widened out to the resurrection of all mankind for the last judgment. A blessed immortality after judgment, or even after death itself, is sometimes taught without reference to any resurrection. Retribution in human history is recognized, but attention is specially concentrated on the final judgment, which is usually conceived as taking place in two stages. (1) The Messianic is executed by the Messiah or the saints by victory in war, or by judicial sentence. (2) The final remains in God's hands; but in one writing (the *Ethiopic Enoch*) is represented as Messiah's function. This judgment either closes the Messianic age, if thought of as temporal, or ushers it in, if conceived as eternal, or closes the world's history, if no Messianic age is expected. The place of torment for the wicked was called Gehenna (the valley of Hinnom or the Sons of Hinnom, where the bodies of criminals were cast out, is described in Is. lxvi. 24). Here corporal as well as spiritual

punishment was endured; it was inflicted on apostate Jews or the wicked generally; the righteous witnessed its initial stages but not its final form. In later Judaism it was the purgatory of faithless Jews, who at last reached Paradise, but it remained the place of eternal torment for the Gentiles. Paradise was sometimes regarded as the division of Sheol to which the righteous passed after death, but at others it was conceived as the heavenly abode of Moses, Enoch and Elijah, to which other saints would pass after the last judgment.

New Testament.

The eschatology of the New Testament attaches itself not only to that of the Old Testament but also to that of contemporary Judaism, but it avoids the extravagances of the latter. Not at all systematic, it is occasional, practical, poetical and dominantly evangelical, laying stress on the hope of the righteous rather than the doom of the wicked. The teaching of Jesus centres, according to the Synoptists, in the great idea of the "Kingdom of God," which is already present in the teacher Himself, but also future as regards its completion. In some parables a gradual realization of the kingdom is indicated (Matt. xiii.); in other utterances its consummation is connected with Christ's own return, His Parousia (Matt. xxiv. 3, 37, 39), the time of which, however, is unknown even to Himself (Mark xiii. 32). In this eschatological discourse (Matt. xxiv., xxv.) He speaks of the destruction of Jerusalem and of the end of the world as near, and seemingly as one. This is in accordance with the characteristic of prophecy, which sees in "timeless sequence" events which are historically separated from one another. While the Return is represented in the Synoptists as an external event, it is conceived in the fourth gospel as an internal experience in the operation of the Spirit on the believer (John xiv. 16-21); nevertheless here also the Parousia in the synoptic sense is looked for (John xxi. 22; cf. 1 John ii. 28). The object of the Second Coming is the execution of judgment by Christ (Matt. xxv. 31), both individual (xxii. 1-14) and universal (xiii. 36-42). The present subjective judgment, in which men determine their destiny by their attitude to Christ, on which the fourth gospel lays stress (John iii. 17-21, ix. 39), is not inconsistent with the anticipation of a final judgment (John xii. 48, v. 27). This judgment presupposes the resurrection, belief in which was rejected by the Sadducees, but accepted by the Pharisees and the majority of the Jewish people, and confirmed by Christ, not only as an individual spiritual renovation (John v. 25, 26), but as a universal physical resuscitation (28 and 29; Matt. xxii. 30). This resurrection is of the unjust as well as the just (Matt. v. 29, 30, x. 28; Luke xiv. 14). On the *Intermediate State* Jesus does not speak clearly. He uses the term Hades twice metaphorically (Matt. xi. 23, xvi. 18), and once in a parable, the "Rich Man and Lazarus" (Luke xvi. 23), in which he employs the current phrases such as "Abraham's bosom" (verse 22), without any definite doctrinal intention, to unveil the secrets of the hereafter by confirming with His authority the common beliefs of His time. The term Paradise (Luke xxiii. 43) seems to be used "in a large and general sense as a word of hope and comfort," and we need not attach to it any of the more definite associations which it had in Jewish eschatology. When he speaks of death as "sleep" (Luke viii. 52; John xi. 11) it is to give men gentler and sweeter thoughts of it, not to inculcate the doctrine of an intermediate state as an unconscious condition. There are words which suggest rather the hope of an immediate entrance of the just into the Father's house and glory (John xiv. 2, 3, xvii. 24). He spoke frequently and distinctly both of final reward for the righteous and final penalty for the wicked. "The recompense of the righteous is described as an inheritance, entrance into the kingdom, treasure in heaven, an existence like the angelic, a place prepared, the Father's house, the joy of the Lord, life, eternal life and the like; and there is no intimation that the reward is capable of change, that the condition is a terminable one. The retribution of the wicked is described as death, outer darkness, weeping and wailing and gnashing of teeth, the undying worm, the quenchless fire, exclusion from the kingdom, eternal punishment and the like" (S.D.J. Salmond in Hastings's *Bible Dictionary*, p. 752). Degrees of award are recognized (Luke xii. 47, 48). Gehenna is applied to the condition of the lost (Matt. xviii. 9). Two sayings are held to point to a terminable penalty (Matt. v. 25, 26, xii. 31, 32), but the one is so figurative and the other so obscure, that we are not warranted in drawing any such definite conclusion from either of them. The finality of destiny seems to be unmistakably expressed (Matt. vii. 23, x. 33, xiii. 30, xxv. 46, xxvi. 24; Mark ix. 43-48, viii. 36; Luke ix. 26; John iii. 16, viii. 21, 24). No second opportunity for deciding the issue of life or death is recognized by Jesus.

Pharisees and Sadducees.

The apostolic eschatology presents resemblance amid difference. Jude (v. 6), as well as 2 Peter (ii. 4), refers to the judgment of the fallen angels. 2 Peter describes the place of their detention as Tartarus, and teaches that Christ's *Parousia* is to bring the whole present system of things to its conclusion, and the world itself to an end (iii. 10, 13). After the destruction of the existing order by fire, "a new heaven and a new earth" will appear as the abode of righteousness. The question of greatest interest in 1 Peter is the relation of two passages in it, the preaching to the spirits in prison (iii. 18-22) and the preaching of the Gospel to the dead (iv. 6) to the "larger hope." Peter's discourse also contains a phrase which suggests the belief of a descent of Christ into Hades in the interval between His death and His resurrection (Acts ii. 31). No certainty has been reached in the interpretation of these passages, but they may suggest to the Christian mind the expectation that the final destiny of no soul can be fixed until in some way or other, in this life or the next, the opportunity of decision for or against Christ has been given. The phrase "the times of restoration of all things" (iii. 21) is too vague in itself, and is too isolated in its context to warrant the dogmatic teaching of universalism, although there are other passages which seem to point towards the same goal. While John's Apocalypse is distinctly eschatological, the Epistles and the Gospels often give these conceptions an ethical and spiritual import, without, however, excluding the eschatological. Life is present while eternal (1 John v. 12, 13), but it is also future (ii. 25). There is expected a future

manifestation of Christ as He is, and what the believer himself will be does not yet appear (iii. 2). The writer speaks of the last hour (ii. 18), the Antichrist that cometh (ii. 22, iv. 3), and the Christian's full reward (2 John v. 8) as well as the Parousia (1 John ii. 28). The Apocalypse reproduces much of the current Jewish eschatology. A millennial reign of Christ on earth is interposed between the first resurrection, confined to the saints and especially the martyrs, and the second resurrection for the rest of the dead. A final outburst of Satan's power is followed by his overthrow and the Last Judgment.

Although Paul sometimes describes the Kingdom of God as present (Rom. xiv. 17; 1 Cor. iv. 20; Col. i. 13), it is usually represented as future. The Parousia fills a large place in his thought, and, if more prominent in his earlier writings, is not altogether absent from his later, although the expectation of personal survival does seem to grow less confident (cf. 1 Cor. xv. 51 and Phil. i. 20-24). The doctrines of the Resurrection, the Last Judgment, the Reward of the Righteous and the Punishment of the Wicked are not less distinctly expressed than in the other apostolic writings. Peculiar elements in Paul's eschatology are the doctrines of the Rapture of the Saints (1 Thess. iv. 17) and the Man of Sin (2 Thess. ii. 3-6), but these have affinities elsewhere. A reference to the millennial reign of Christ in the period between the two resurrections is sometimes sought in 1 Cor. xv. 22-24; but it is not a chronology of the last things Paul is here giving. So also a justification for the doctrine of purgatory is sought in iii. 12-15; but the day and the fire are of the last judgment. A descent of Christ into Hades, implying an extension of the opportunity of grace such as is supposed to be taught in 1 Peter, is also discovered in the obscure statements in Rom. x. 7 (where Paul is freely quoting Deut. xxx. 11-14), and Eph. iv. 10 (where he is commenting on Ps. lxviii. 18). Universal restoration is inferred from 1 Cor. xv. 24-28, "God all in all," Phil. ii. 10-11, every knee bowing to, and every tongue confessing Jesus Christ, Eph. i. 9, 10, the summing up of all things in Christ, Col. i. 20, God reconciling all things unto Himself in Christ. These passages inspire a hope, but do not sustain a certainty. Paul's shrinking from the disembodied state and longing to be clothed upon at death in 2 Cor. v. 1-8, cannot be regarded as a proof of an *interim* body prior to and preparatory for the resurrection body. Paul links the human resurrection with a universal renovation (Rom. viii. 19-23). Paul's eschatology is not free of obscurities and ambiguities; and in the New Testament eschatology generally we are forced to recognize a mixture of inherited Jewish and original Christian elements (see ANTICHRIST).

During the first century of the existence of the Gentile Christian Church, "the hope of the approaching end of the world and the glorious kingdom of Christ" was dominant, although warnings had to be given against doubt and indifference. Redemption was thought of as still future, as the power of the devil had not been broken but rather increased by the First Advent, and the Second Advent was necessary to his complete overthrow. The expectations were often grossly materialistic, as is evidenced by Papias's quotation as the words of the Lord of a group of sayings from the Apocalypse of Baruch, setting forth the amazing fruitfulness of the earth in the Messianic time.

Gnostics. Montanism.

The Gnostics rejected this eschatology as in their view the enlightened spirit already possessed immortality. Marcion expected that the Church would be assailed by Antichrist; a visible return of Christ he did not teach, but he recognized that human history would issue in a separation of the good from the bad. Montanism sought to form a new Christian commonwealth which, separated from the world, should prepare itself for the descent of the Jerusalem from above, and its establishment in the spot which by the direction of the Spirit had been chosen in Phrygia. While Irenaeus held fast the traditional eschatological beliefs, yet his conception of the Christian salvation as a deification of man tended to weaken their hold on Christian thought. The Alogi in the 2nd century rejected the Apocalypse on account of its chiliasm, its teaching of a visible reign of Christ on earth for a thousand years. Montanism also brought these apocalyptic expectations into discredit in orthodox ecclesiastical circles. The Alexandrian theology strengthened this movement against chiliasm. Clement of Alexandria taught that justice is not merely retributive, that punishment is remedial, that probation continues after death till the final judgment, that Christ and the apostles preached the Gospel in Hades to those who lacked knowledge, but whose heart was right, that a spiritual body will be raised. Origen taught that a germ of the spiritual body is in the present body, and its development depends on the character, that perfect bliss is reached only by stages, that the evil are purified by pain, conscience being symbolized by fire, and that all, even the devil himself, will at last be saved. Both regarded chiliasm with aversion. But in the 5th century there were rejected as heretical (1) "the doctrine of universalism, and the possibility of the redemption of the devil; (2) the doctrine of the complete annihilation of evil; (3) the conception of the penalties of hell as tortures of conscience; (4) the spiritualizing version of the resurrection of the body; (5) the idea of the continued creation of new worlds" (A. Harnack, *History of Dogma*, iii. p. 186).

Epiphanius, following Methodius, insisted on the most perfect identity between the resurrection body and the material body; and this belief, enforced in the West by Jerome, soon established itself as alone orthodox. Augustine made experiments on the flesh of a peacock in order to find physical evidence for the doctrine. He held fast to eternal punishment, but allowed the possibility of mitigations. Some believers, he taught, may pass through purgatorial fires; and this middle class may be helped by the sacraments and the alms of the living. "There are many souls not good enough to dispense with this provision, and not bad enough to be benefited by it" (*op. cit.* v. 233). This doctrine was sanctioned and developed by Gregory the Great. "After God has changed eternal punishments into temporary, the justified must expiate these temporary penalties for sin in purgatory" (p. 268).

This view was inferred indirectly from Matt. xii. 31, and directly from 1 Cor. iii. 12-15. Afterwards purgatory took more and more the place of hell, and was subject to the control of the church. As regards the saints, different degrees of blessedness were recognized; they were supposed to wait in Hades for the return of Christ, but gradually the belief gained ground, especially in regard to the martyrs, that their souls at once entered Paradise. The primitive Christian eschatology was preserved in the West as it was not in the East, and in times of exceptional distress the expectation of Antichrist emerged again and again. In the middle ages there was an extravagance of speculation on this subject, which may be seen in the last division of Aquinas' *Summa Theologiae*. He proposes thirty questions on these matters, among which are the following: "whether souls are conducted to heaven or hell immediately after death"; "whether the limbus of hell is the same as Abraham's bosom"; "whether the sun and moon will be really obscured at the day of judgment"; "whether all the members of the human body will rise with it"; "whether the hair and nails will reappear"; could thought become "more lawless and uncertain"?

In Protestant Theology.

While rejecting purgatory, Protestantism took over this eschatology. Souls passed at once to heaven or to hell; a doctrine even less adequate to the complex quality of human life. Luther himself looked for the passing away of the present evil world. Socinianism taught a new spiritual body, an intermediate state in which the soul is near non-existence, an annihilation of the wicked, as immortality is the gift of God. Swedenborg discards a physical resurrection, as at death the eyes of men are opened to the spiritual world in which we exist now, and they continue to live essentially as they lived here, until by their affinities they are drawn to heaven or hell. The doctrine of *eternal punishment* has been opposed on many grounds, such as the disproportion between the offence and the penalty, the moral and religious immaturity of the majority of men at death, the diminution of the happiness of heaven involved in the knowledge of the endless suffering of others (Schleiermacher), the defeat of the divine purpose of righteousness and grace that the continued antagonism of any of God's creatures would imply, the dissatisfaction God as Father must feel until His whole family is restored. It has been argued that the term "eternal" has reference not to duration of time but quality of being (Maurice); but it does seem certain that the writers in the Holy Scriptures who used it did not foresee an end either to the life or to the death to which they applied the term. The contention should not be based on the meaning of a single word, but on such broader considerations as have been indicated above. The doctrine of *conditional* immortality taught by Socinianism was accepted by Archbishop Whately, and has been most persistently advocated by Edward White, who "maintains that immortality is a truth, not of reason, but of revelation, a gift of God" bestowed only on believers in Christ; but he admits a continued probation after death for such as have not hardened their hearts by a rejection of Christ. According to Albrecht Ritschl "the *wrath* of God means the resolve of God to annihilate those men who finally oppose themselves to redemption, and the final purpose of the kingdom of God." He thus makes immortality conditional on inclusion in the kingdom of God. The doctrine of *universal restoration* was maintained by Thomas Erskine of Linlathen on the ground of the Fatherhood of God, and Archdeacon Wilson anticipates such discipline after death as will restore all souls to God. C.I. Nitzsch argues against the doctrine of the annihilation of the wicked, regards the teaching of Scripture about eternal damnation as hypothetical, and thinks it possible that Paul reached the hope of universal restoration. I.A. Dorner maintains that hopeless perdition can be the penalty only of the deliberate rejection of the Gospel, that those who have not had the opportunity of choice fairly and fully in this life will get it hereafter, but that the right choice will in all cases be made we cannot be confident. The attitude of theologians generally regarding individual destiny is well expressed by Dr James Orr, "The conclusion I arrive at is that we have not the elements of a complete solution, and we ought not to attempt it. What visions beyond there may be, what larger hopes, what ultimate harmonies, if such there are in store, will come in God's good time; it is not for us to anticipate them, or lift the veil where God has left it down" (*The Christian View of God and the World*, 1893, p. 397).

Although in recent theological thought attention has been mainly directed to individual destiny, yet the other elements of Christian eschatology must not be altogether passed over. History has offered the authoritative commentary on the prophecy of the Parousia of Christ. The presence and power of His Spirit, the spread of His Gospel, the progress of His kingdom have been as much a fulfilment of the eschatological teaching of the New Testament as His life and work on earth were a fulfilment of Messianic prophecy, for fulfilment always transcends prophecy. Even if the common beliefs of the apostolic age have not modified the evangelist's reports of Jesus' teaching, it must be remembered that He used the common prophetic phraseology, the literal fulfilment of which is not to be looked for. Some parables (the leaven, the mustard seed) suggest a gradual progressive realization of His kingdom. The Fourth Gospel interprets both judgment and resurrection spiritually. Accordingly the general resurrection and the last judgment may be regarded as the temporal and local forms of thought to express the universal permanent truths that life survives death in the completeness of its necessary organs and essential functions, and that the character of that continued life is determined by personal choice of submission or antagonism to God's purpose of grace in Christ, the perfect realization of which is the Christian's hope for himself, mankind and the world.

Bibliography.—In addition to the works referred to above the following will be found useful: S.D.F. Salmond, *The Christian Doctrine of Immortality* (4th ed., 1901); R.H. Charles, *A Critical History of the Doctrine of a Future Life in Israel, in Judaism, and in Christianity* (1899); L.N. Dahle, *Life after Death and the Future of the Kingdom of God* (Eng. tr. by J. Beveridge, 1895); J.A. Beet, *The Last Things* (new ed., 1905); W.G.T. Shedd, *Doctrine of Endless Punishment* (New York, 1886); F.W. Farrar, *The*

Eternal Hope (1892); E. Pétavel, *The Problem of Immortality* (Eng. tr. by F.A. Freer, 1892); E. White, *Life in Christ* (3rd ed., 1878); also the relevant sections in books on biblical and systematic theology.
(A. E. G.*)

ESCHEAT (O. Fr. *eschete*, from *escheoir*, to fall to one's share; Lat. *excidere*, to fall out), in English law, the reversion of lands to the next lord on the failure of heirs of the tenant. "When the tenant of an estate in fee simple dies without having alienated his estate in his lifetime or by his will, and without leaving any heirs either lineal or collateral, the lands in which he held his estate escheat, as it is called, to the lord of whom he held them" (Williams on the *Law of Real Property*). This rule is explained by the conception of a freehold estate as an interest in lands held by the freeholder from some lord, the king being lord paramount. (See ESTATE.) The granter retains an interest in the land similar to that of the donor of an estate for life, to whom the land reverts after the life estate is ended. As there are now few freehold estates traceable to any mesne or intermediate lord, escheats, when they do occur, fall to the king as lord paramount. Besides escheat for defect of heirs, there was formerly also escheat *propter delictum tenentis*, or by the corruption of the blood of the tenant through attainder consequent on conviction and sentence for treason or felony. The blood of the tenant becoming corrupt by attainder was decreed no longer inheritable, and the effect was the same as if the tenant had died without heirs. The land, therefore, escheated to the next heir, subject to the superior right of the crown to the forfeiture of the lands,—in the case of treason for ever, in the case of felony for a year and a day. All this was abolished by the Felony Act 1870, which provided for the appointment of an administrator to the property of the convict. Escheat is also an incident of copyhold tenure. Trust estates were not subject to escheat until the Intestates' Estates Act 1884, but now by that act the law of escheat applies in the same manner as if the estate or interest were a legal estate in corporeal hereditaments.

ESCHENBURG, JOHANN JOACHIM (1743-1820), German critic and literary historian, was born at Hamburg on the 7th of December 1743. After receiving his early education in his native town, he studied at Leipzig and Göttingen. In 1767 he was appointed tutor, and subsequently professor, at the Collegium Carolinum in Brunswick. The title of "Hofrat" was conferred on him in 1786, and in 1814 he was made one of the directors of the Carolinum. He is best known by his efforts to familiarize his countrymen with English literature. He published a series of German translations of the principal English writers on aesthetics, such as J. Brown, D. Webb, Charles Burney, Joseph Priestley and R. Hurd; and Germany owes also to him the first complete translation (in prose) of Shakespeare's plays (*William Shakespear's Schauspiele*, 13 vols., Zürich, 1775-1782). This is virtually a revised edition of the incomplete translation published by Wieland between 1762 and 1766. Eschenburg died at Brunswick on the 29th of February 1820.

Besides editing, with memoirs, the works of Hagedorn, Zachariä and other German poets, he was the author of a *Handbuch der klassischen Literatur* (1783); *Entwurf einer Theorie und Literatur der schönen Wissenschaften* (1783); *Beispielsammlung zur Theorie und Literatur der schönen Wissenschaften* (8 vols., 1788-1795); *Lehrbuch der Wissenschaftskunde* (1792); and *Denkmäler altdeutscher Dichtkunst* (1799). Most of these works have passed through several editions. Eschenburg was also a poet of some pretensions, and some of his religious hymns, *e.g. Ich will dich noch im Tod erheben* and *Dir trau' ich, Gott, und wanke nicht*, are contained in many hymnals to this day.

ESCHENMAYER, ADAM KARL AUGUST VON (1768-1852), German philosopher and physicist, was born at Neuenburg in Württemberg in July 1768. After receiving his early education at the Caroline academy of Stuttgart, he entered the university of Tübingen, where he received the degree of doctor of medicine. He practised for some time as a physician at Sulz, and then at Kirchheim, and in 1811 he was chosen extraordinary professor of philosophy and medicine at Tübingen. In 1818 he became ordinary professor of practical philosophy, but in 1836 he resigned and took up his residence at Kirchheim, where he devoted his whole attention to philosophical studies. Eschenmayer's views are largely identical with those of Schelling, but he differed from him in regard to the knowledge of the absolute. He believed that in order to complete the arc of truth philosophy must be supplemented by what he called "non-philosophy," a kind of mystical illumination by which was obtained a belief in

God that could not be reached by mere intellectual effort (see Höffding, *Hist. of Mod. Phil.*, Eng. trans. vol. 2, p. 170). He carried this tendency to mysticism into his physical researches, and was led by it to take a deep interest in the phenomena of animal magnetism. He ultimately became a devout believer in demoniacal and spiritual possession; and his later writings are all strongly impregnated with the lower supernaturalism.

His principal works are—*Die Philosophie in ihrem Übergange zur Nichtphilosophie* (1803); *Versuch die scheinbare Magie des thierischen Magnetismus aus physiol. und psychischen Gesetzen zu erklären* (1816); *System der Moralphilosophie* (1818); *Psychologie in drei Theilen, als empirische, reine, angewandte* (1817, 2nd ed. 1822); *Religionsphilosophie* (3 vols., 1818-1824); *Die Hegel'sche Religionsphilosophie verglichen mit dem christl. Princip* (1834); *Der Ischariotismus unserer Tage* (1835) (directed against Strauss's *Life of Jesus*); *Konflikt zwischen Himmel und Hölle, an dem Dämon eines besessenen Mädchens beobachtet* (1837); *Grundriss der Naturphilosophie* (1832); *Grundzüge der christl. Philosophie* (1840); and *Betrachtungen über den physischen Weltbau* (1852).

ESCHER VON DER LINTH, ARNOLD (1807-1872), Swiss geologist, the son of Hans Conrad Escher (1767-1823), was born at Zürich on the 8th of June 1807. In 1856 he became professor of geology at the École Polytechnique at Zürich. His researches led him to be regarded as one of the founders of Swiss geology. With B. Studer he produced (1852-1853) the first elaborate geological map of Switzerland. He was the author also of *Geologische Bemerkungen über das nördliche Vorarlberg und einige angrenzenden Gegenden*, published at Zürich in 1853. He died on the 12th of July 1872.

ESCHSCHOLTZ, JOHANN FRIEDRICH (1793-1831), Russian traveller and naturalist, was born in November 1793, at Dorpat, where he died in May 1831. He was naturalist and physician to Otto von Kotzebue's exploring expedition during 1815-1818. On his return he was appointed extraordinary professor of anatomy (1819) and director of the zoological museum of the university at Dorpat (1822), and in 1823-1826 he accompanied Kotzebue on his second voyage of discovery. He became ordinary professor of anatomy at Dorpat in 1828. Among his publications were the *System der Akalephen* (1829), and the *Zoologischer Atlas* (1829-1833). The botanical genus *Eschscholtzia* was named by Adelbert von Chamisso in his honour.

ESCHWEGE, a town of Germany, in the Prussian province of Hesse-Nassau, on the Werra, and the railway Treysa-Leinefelde, 28 m. S.E. of Cassel. Pop. (1905) 11,113. It consists of the old town on the left, the new town on the right, bank of the Werra, and Brückenhausen on a small island connected with the old and new town by bridges. It is a thriving manufacturing town, its chief industries being leather-making, yarn-spinning, cotton- and linen-weaving, the manufactures of cigars, brushes, liquors and oil, and glue- and soap-boiling. It has two ancient buildings, the Nikolai-turm, built in 1455, and the old castle. After being part of Thuringia, Eschwege passed to Hesse in 1263. It was recovered by the landgrave of Thuringia in 1388, but soon reverted to Hesse, and it became the residence of one of the branches of the Hessian royal house, a branch which died out in 1655.

ESCHWEILER, a town of Germany, in the Prussian Rhine province, on the Inde, and the railways Cologne-Herbesthal and Munich-Gladbach-Stolberg, about 8 m. E.N.E. from Aix-la-Chapelle. Pop. (1905) 20,643. The town has an Evangelical and four Roman Catholic churches, a gymnasium and an orphanage. The manufacture of iron and steel goods is carried on; other industries include the manufacture of zinc wares, tanning, distilling and brewing. In the neighbourhood there are valuable coal mines.

See Koch, *Geschichte der Stadt Eschweiler* (Frankfort, 1890).

ESCOBAR Y MENDOZA, ANTONIO (1589-1669), Spanish churchman of illustrious descent, was born at Valladolid in 1589. He was educated by the Jesuits, and at the age of fifteen took the habit of that order. He soon became a famous preacher, and his facility was so great that for fifty years he preached daily, and sometimes twice a day. In addition he was a voluminous writer, and his works fill eighty-three volumes. His first literary efforts were Latin verses in praise of Ignatius Loyola (1613) and the Virgin Mary (1618); but he is best known as a writer on casuistry. His principal works belong to the fields of exegesis and moral theology. Of the latter the best known are *Summula casuum conscientiae* (1627); *Liber theologiae moralis* (1644), and *Universae theologiae moralis problemata* (1652-1666). The first mentioned of these was severely criticised by Pascal in the fifth and sixth of his *Provincial Letters*, as tending to inculcate a loose system of morality. It contains the famous maxim that purity of intention may be a justification of actions which are contrary to the moral code and to human laws; and its general tendency is to find excuses for the majority of human frailties. His doctrines were disapproved of by many Catholics, and were mildly condemned by Rome. They were also ridiculed in witty verses by Molière, Boileau and La Fontaine, and gradually the name Escobar came to be used in France as a synonym for a person who is adroit in making the rules of morality harmonize with his own interests. Escobar himself is said to have been simple in his habits, a strict observer of the rules of his order, and unweariedly zealous in his efforts to reform the lives of those with whom he had to deal. It has been said of him that “he purchased heaven dearly for himself, but gave it away cheap to others.” He died on the 4th of July 1669.

ESCOIQUIZ, JUAN (1762-1820), Spanish ecclesiastic, politician and writer, was born in Navarre in 1762. His father was a general officer and he began life as a page in the court of King Charles III. He entered the church and was provided for by a prebend at Saragossa. Godoy in his memoirs asserts that Escoiquiz sought to gain his favour by flattery. There is every reason to believe that this is an accurate statement of the case. The mere fact that he was selected to be the tutor of the heir-apparent, Ferdinand, afterwards King Ferdinand VII., is of itself a proof that he exerted himself to gain the goodwill of the reigning favourite. In 1797 he published a translation of Young’s *Night Thoughts*, which does not of itself show that he was well acquainted with English, for the version may have been made with the help of the French. In 1798 he published a long and worthless so-called epic on the conquest of Mexico. Escoiquiz was in fact a busy and pushing member of the literary clique which looked up to Godoy as its patron. But his position as tutor to the heir to the throne excited his ambition. He began to hope that he might play the part of those court ecclesiastics who had often had an active share in the government of Spain. As Ferdinand grew up, and after his marriage with a Neapolitan princess, he became the centre of a court opposition to Godoy and to his policy of alliance with France. Escoiquiz was the brains, as far as there were any brains, of the intrigue. His activity was so notorious that he was exiled from court, but was consoled by a canonry at Toledo. This half measure was as ineffective as was to have been expected. Escoiquiz continued to be in constant communication with the prince. Toledo is close to Madrid, and the correspondence was easily maintained. He had a large share in the conspiracy of the Escorial which was detected on the 28th of October 1807. He was imprisoned and sent for trial with other conspirators. But as they had appealed to Napoleon, who would not suffer his name to be mentioned, the government had to allow the matter to be hushed up, and the prisoners were acquitted. After the outbreak at Aranjuez on the 17th of March 1808, in which he had a share, he became one of the most trusted advisers of Ferdinand. The new king’s decision to go to meet Napoleon at Bayonne was largely inspired by him. In 1814 Escoiquiz published at Madrid his *Idea Sencilla de las razones que motivaron el viage del Rey Fernando VII. à Bayona* (Honest representation of the causes which inspired the journey of King Ferdinand VII. to Bayonne). It is a valuable historical document, and contains a singularly vivid account of an interview with Napoleon. Escoiquiz was far too firmly convinced of his ingenuity and merits to conceal the delusions and follies of himself and his associates. He displays his own vanity, frivolity and futile cleverness with much unconscious humour, but, it is only fair to allow, with some literary dexterity. When the Spanish royal family was imprisoned by Napoleon, Escoiquiz remained with Ferdinand at Valençay. In 1813 he published at Bourges a translation of Milton’s *Paradise Lost*. When Ferdinand was released in 1814 he came back to Madrid in the hope that his ambition would now be satisfied, but the king was tired of him, and was moreover resolved never to be subjected by any favourite. After a very brief period of office in 1815 he was sent as a prisoner to Murcia. Though he was afterwards recalled, he was again exiled to Ronda, where he died on the 27th of November 1820.

ESCOMBE, HARRY (1838-1899), South African statesman, a member of a Somersetshire family, was born at Notting Hill, London, on the 25th of July 1838, and was educated at St Paul’s school.

After four years in a stockbroker's office, he emigrated, in 1859, to the Cape. The following year he moved to Natal, and, after trying other occupations, qualified as an attorney. He became recognized as the ablest pleader in the colony, and, in 1872, was elected for Durban as a member of the legislative council, and subsequently was also placed on the executive council. In 1880 he secured the appointment of a harbour board for Natal, and was himself made chairman. The transformation of the port of Durban into a harbour available for ocean liners was due entirely to his energy. In 1888-1889 he defended Dinizulu and other Zulu chiefs against a charge of high treason. For several years he opposed the grant of responsible government to Natal, but by 1890 had become convinced of its desirability, and on its conferment in 1893 he joined the first ministry formed, serving under Sir John Robinson as attorney-general. In February 1897, on Sir John's retirement, Escombe became premier, remaining attorney-general and also holding the office of minister of education and minister of defence. In the summer of that year he was in London with the other colonial premiers at the celebration of the Diamond Jubilee of Queen Victoria, and was made a member of the privy council. Cambridge University conferred upon him the honorary degree of LL.D. The election that followed his return to Natal proved unfavourable to his policy, and he resigned office (October 1897). Throughout his life he took an active interest in national defence. He had served in the Zulu War of 1879, was commander of the Natal Naval Volunteers and received the volunteer long service decoration. In October 1899 he went to the northern confines of the colony to take part in preparing measures of defence against the invasion by the Boers. He died on the 27th of December 1899.

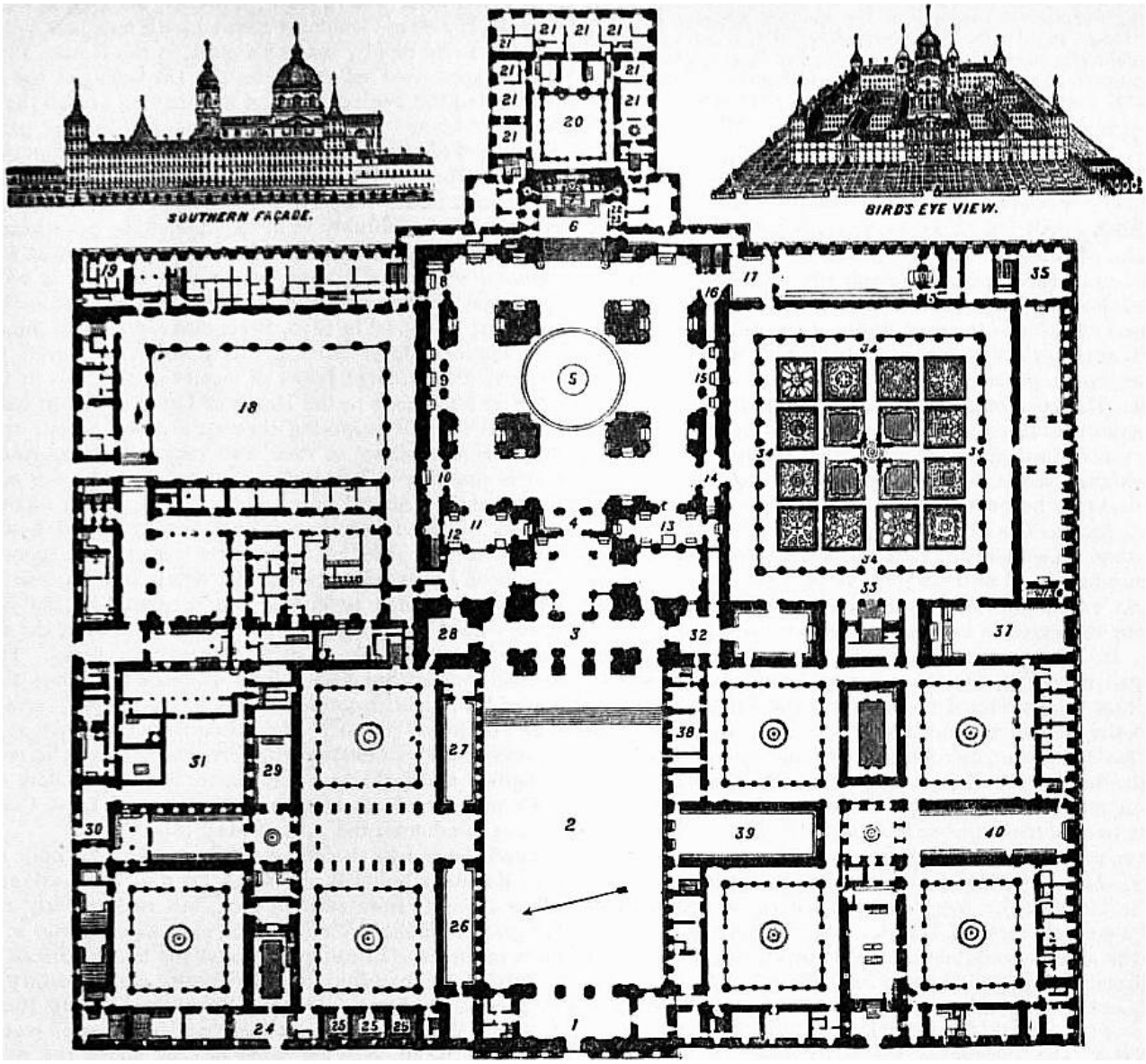
The *Speeches of the late Right Hon. Harry Escombe* (Maritzburg, 1903), edited by J.T. Henderson, contains brief biographical notes by Sir John Robinson and the editor.

ESCORIAL, or Escurial, in Spain, one of the most remarkable buildings in Europe, comprising at once a convent, a church, a palace and a mausoleum. The Escorial is situated 3432 ft. above the sea, on the south-western slopes of the Sierra de Guadarrama, and thus within the borders of the province of Madrid and the kingdom of New Castile. By the Madrid-Ávila railway it is 31 m. N.W. of Madrid. The surrounding country is a sterile and gloomy wilderness exposed to the cold and blighting blasts of the Sierra.

According to the usual tradition, which there seems no sufficient reason to reject, the Escorial owes its existence to a vow made by Philip II. of Spain (1556-1598), shortly after the battle of St Quentin, in which his forces succeeded in routing the army of France. The day of the victory, the 10th of August 1557, was sacred to St Laurence; and accordingly the building was dedicated to that saint, and received the title of *El real monasterio de San Lorenzo del Escorial*. The last distinctive epithet was derived from the little hamlet in the vicinity which furnished shelter, not only to the workmen, but to the monks of St Jerome who were afterwards to be in possession of the monastery; and the hamlet itself is generally but perhaps erroneously supposed to be indebted for its name to the *scoriae* or dross of certain old iron mines. The preparation of the plans and the superintendence of the work were entrusted by the king to Juan Bautista de Toledo, a Spanish architect who had received most of his professional education in Italy. The first stone was laid in April 1563; and under the king's personal inspection the work rapidly advanced. Abundant supplies of *berroqueña*, a granite-like stone, were obtained in the neighbourhood, and for rarer materials the resources of both the Old and the New World were put under contribution. The death of Toledo in 1567 threatened a fatal blow at the satisfactory completion of the enterprise, but a worthy successor was found in Juan Herrera, Toledo's favourite pupil, who adhered in the main to his master's designs. On the 13th of September 1584 the last stone of the masonry was laid, and the works were brought to a termination in 1593. Each successive occupant of the Spanish throne has done something, however slight, to the restoration or adornment of Philip's convent-palace, and Ferdinand VII. (1808-1833) did so much in this way that he has been called a second founder. In all its principal features, however, the Escorial remains what it was made by the genius of Toledo and Herrera working out the grand, if abnormal, desires of their master.

The ground plan of the building is estimated to occupy an area of 396,782 sq. ft., and the total area of all the storeys would form a causeway 1 metre in breadth and 95 m. in length. There are seven towers, fifteen gateways and, according to Los Santos, no fewer than 12,000 windows and doors. The general arrangement is shown by the accompanying plan. Entering by the main entrance the visitor finds himself in an atrium, called the Court of the Kings (*Patio de los reyes*), from the 16th-century statues of the kings of Judah, by Juan Bautista Monegro, which adorn the façade of the church. The sides of the atrium are unfortunately occupied by plain ungainly buildings five storeys in height, awkwardly accommodating themselves to the upward slope of the ground. Of the grandeur of the church itself, however, there can be no question: it is the finest portion of the whole Escorial, and, according to Fergusson, deserves to rank as one of the great Renaissance churches of Europe. It is about 340 ft. from east to west by 200 from north to south, and thus occupies an area of about 70,000 sq. ft. The dome is 60 ft. in diameter, and its height at the centre is about 320 ft. In glaring contrast to the bold and simple forms of the architecture, which belongs to the Doric style, were the bronze and marbles and pictures of the high altar, the masterpiece of the Milanese Giacomo Trezzo, almost

ruined by the French in 1808. Directly under the altar is situated the pantheon or royal mausoleum, a richly decorated octagonal chamber with upwards of twenty niches, occupied by black marble *urnas* or sarcophagi, kept sacred for the dust of kings or mothers of kings. There are the remains of Charles V. (1516-1556), of Philip II., and of all their successors on the Spanish throne down to Ferdinand VII., with the exception of Philip V. (1700-1746) and Ferdinand VI. (1746-1759). Several of the sarcophagi are still empty. For the other members of the royal family there is a separate vault, known as the *Panteon de los Infantes*, or more familiarly by the dreadfully suggestive name of *El Pudridero*. The most interesting room in the palace is Philip II.'s cell, from which through an opening in the wall he could see the celebration of mass while too ill to leave his bed.



Views and Plan of the Escorial.[1]

CHURCH

1. Principal entrance and portico.
2. Court of the kings (*Patio de los reyes*).
3. Vestibule of the church.
4. Choir of the seminarists.
5. Centre of the church and projection of the dome.
6. Greater chapel.
7. High altar.
8. Chapel of St John.
9. Chapel of St Michael.
10. Chapel of St Maurice.
11. Chapel of the Rosary.
12. Tomb of Louisa Carlota.
13. Chapel of the *Patrocinio*.
14. Chapel of the *Cristo de la buena muerte*.
15. Chapel of the Eleven Thousand Virgins.
16. Former Chapel of the *Patrocinio*.
17. Sacristy.

PALACE

18. Principal court of the palace.
19. Ladies' tower.
20. Court of the masks.
21. Apartments of the royal children.
22. Royal oratory.
23. Oratory where Philip II. died.

SEMINARY

24. Entrance to seminary.
25. Classrooms.
26. Old philosophical hall.
27. Old theological hall.
28. Chamber of secrets.
29. Old refectory.
30. Entrance to the college.
31. College yard.

CONVENT

32. Clock tower.
33. Principal cloister.
34. Court of the evangelists.
35. Prior's cell.
36. Archives.
37. Old church.
38. Visitors' hall.
39. Manuscript library.
40. Convent refectory.

The library, situated above the principal portico, was at one time one of the richest in Europe,

comprising the king's own collection, the extensive bequest of Diego de Mendoza, Philip's ambassador to Rome, the spoils of the emperor of Morocco, Muley Zidan (1603-1628) and various contributions from convents, churches and cities. It suffered greatly in the fire of 1671, and has since been impoverished by plunder and neglect. Among its curiosities still extant are two New Testament Codices of the 10th century and two of the 11th; various works by Alphonso the Wise (1252-1284), a Virgil of the 14th century, a Koran of the 15th, &c. Of the Arabic manuscripts which it contained in the 17th century a catalogue was given in J.H. Hottinger's *Promptuarium sive bibliotheca orientalis*, published at Heidelberg in 1658, and another in the 18th, in M. Casiri's *Bibliotheca Arabico-Hispanica* (2 vols., Madrid, 1760-1770). Of the artistic treasures with which the Escorial was gradually enriched, it is sufficient to mention the frescoes of Peregrin or Pellagrino Tibaldi, Luis de Carbajal, Bartolommeo Carducci or Carducho, and Luca Giordano, and the pictures of Titian, Tintoretto and Velasquez. These paintings all date from the 15th or the 17th century. Many of those that are movable have been transferred to Madrid, and many others have perished by fire or sack. The conflagration of 1671, already mentioned, raged for fifteen days, and only the church, a part of the palace, and two towers escaped uninjured. In 1808 the whole building was exposed to the ravages of the French soldiers under General La Houssaye. On the night of the 1st of October 1872, the college and seminary, a part of the palace and the upper library were devastated by fire; but the damage was subsequently repaired. In 1885 the conventual buildings were occupied by Augustinian monks.

The reader will find a remarkable description of the emotional influence of the Escorial in E. Quinet's *Vacances en Espagne* (Paris, 1846), and for historical and architectural details he may consult the following works:—Fray Juan de San Geronimo, *Memorias sobre la fundacion del Escorial y su fabrica*, in the *Coleccion de documentos ineditos para la historia de España*, vol. vii.; Y. de Herrera, *Sumario y breve declaracion de los diseños y estampas de la fab. de S. Lorencio el Real del Escurial* (Madrid, 1589); José de Siguenza, *Historia de la orden de San Geronyno*, &c. (Madrid, 1590). L. de Cabrera de Cordova, *Felipe Segundo* (Madrid, 1619); James Wadsworth, *Further Observations of the English Spanish Pilgrime* (London, 1629, 1630); Ilario Mazzorali de Cremona, *Le Reali Grandezze del Escuriale* (Bologna, 1648); De los Santos, *Descripcion del real monasterio*, &c. (Madrid, 1657); Andres Ximenes, *Descripcion*, &c. (Madrid, 1764); Y. Quevedo, *Historia del Real Monasterio*, &c. (Madrid, 1849); A. Rotondo, *Hist. artistica, ... del monasterio de San Lorenzo* (Madrid, 1856-1861); W.H. Prescott, *Life of Philip II.* (London, 1887); J. Fergusson, *History of the Modern Styles of Architecture* (London, 1891-1893); Sir W. Stirling-Maxwell, *Annals of the Artists of Spain* (London, 1891).

1 Reduced from a large plan of the Escorial in the British Museum, *Monasterio del Escorial*, published at Madrid in 1876.

ESCOVEDO, JUAN DE (*d.* 1578), Spanish politician, secretary of Don John of Austria, and chiefly notable as having been the victim of one of the mysteries of the 16th century, began life in the household of Ruy Gomez de Silva, prince of Eboli, the most trusted minister of the early years of the reign of Philip II. By the will of the prince he was endowed for life with the post of *Regidor*, or legal representative of the king in the municipality of Madrid. He was also associated with Antonio Perez as one of the secretaries who acted as the agents of the king in all dealings with the various governing boards which formed the Spanish administration. When Don John of Austria, after the battle of Lepanto in 1571, began to launch on a policy of self-seeking adventure, Escovedo was appointed as his secretary with the intention that he should act as a check on these follies. Unhappily for himself and for Don John he went heart and soul into all the prince's schemes. He began to disobey orders from Madrid and became entangled in intrigues to manage or even to coerce the king. In July 1577, and contrary to the king's orders, he came to Spain from Flanders, where Don John was then governor. It is said that he discovered the love intrigue between Antonio Perez and the widowed princess of Eboli, Ana Mendoza de la Cerda. This is, however, mere gossip and supposition. There can be no doubt that he was a busy intriguer, or that the king, acting on the then very generally accepted doctrine that the sovereign has a right to act for the public interest without regard to forms of law, gave orders to Antonio Perez that he was to be put out of the way. After two clumsy attempts had been made to poison him at Perez's table, he was killed by bravos on the night of Easter Monday, the 31st of March 1578. According to an old tradition the murder took place outside the church of St Maria in Madrid, which was pulled down in 1868.

See Gaspar Muro, *La Princesse d'Eboli* (Paris, 1878); and W.H. Prescott, *Reign of Philip II.* (1855-59).

ESCUINTLA, the capital of the department of Escuintla, Guatemala; on the southern slope of the Sierra Madre, 45 m. S.W. of Guatemala city. Pop. (1905) about 12,000. Escuintla is locally celebrated for its hot mineral springs. It is the commercial centre of a fertile district, which produces coffee, cane-sugar and cocoa; it has also a brisk transit trade in most of the products of Guatemala, owing to its position on the interoceanic railway between Puerto Barrios on the Atlantic and San José (30 m. S.) on the Pacific. A branch railway which goes westward to San Augustin meets this line at Escuintla.

ESCUTCHEON (O. Fr. *escucheon*, *escusson*, modern *écusson*, through a Late Lat. form from Lat. *scutum*, shield), an heraldic term for a shield with armorial bearings displayed (see HERALDRY). The word is also applied to the shields used on tombs, in the spandrils of doors or in string-courses, and to the ornamented plates from the centre of which door-rings, knockers, &c., are suspended, or which protect the wood of the key-hole from the wear of the key. In medieval times these were often worked in a very beautiful manner.

ESHER, WILLIAM BALIOL BRETT, 1ST VISCOUNT (1817-1899), English lawyer and master of the rolls, was a son of the Rev. Joseph G. Brett, of Chelsea, and was born on the 13th of August 1817. He was educated at Westminster and at Caius College, Cambridge. Called to the bar in 1840, he went the northern circuit, and became a Q.C. in 1861. On the death of Richard Cobden he unsuccessfully contested Rochdale as a Conservative, but in 1866 was returned for Helston in unique circumstances. He and his opponent polled exactly the same number of votes, whereupon the mayor, as returning officer, gave his casting vote for the Liberal candidate. As this vote was given after four o'clock, however, an appeal was lodged, and the House of Commons allowed both members to take their seats. Brett rapidly made his mark in the House, and in 1868 he was appointed solicitor-general. On behalf of the crown he prosecuted the Fenians charged with having caused the Clerkenwell explosion. In parliament he took a leading part in the promotion of bills connected with the administration of law and justice. He was (August 1868) appointed a justice in the court of common pleas. Some of his sentences in this capacity excited much criticism, notably so in the case of the gas stokers' strike, when he sentenced the defendants to imprisonment for twelve months, with hard labour, which was afterwards reduced by the home secretary to four months. On the reconstitution of the court of appeal in 1876, Brett was elevated to the rank of a lord justice. After holding this position for seven years, he succeeded Sir George Jessel as master of the rolls in 1883. In 1885 he was raised to the House of Lords as Baron Esher. He opposed the bill proposing that an accused person or his wife might give evidence in their own case, and supported the bill which empowered lords of appeal to sit and vote after their retirement. The Solicitors Act of 1888, which increased the powers of the Incorporated Law Society, owed much to his influence. In 1880 he delivered a remarkable speech in the House of Lords, deprecating the delay and expense of trials, which he regarded as having been increased by the Judicature Acts. Lord Esher suffered, perhaps, as master of the rolls from succeeding a lawyer of such eminence as Jessel. He had a caustic tongue, but also a fund of shrewd common sense, and one of his favourite considerations was whether a certain course was "business" or not. He retired from the bench at the close of 1897, and a viscounty was conferred upon him on his retirement, a dignity never given to any judge, lord chancellors excepted, "for mere legal conduct since the time of Lord Coke." He died in London on the 24th of May 1899.

Lord Esher was succeeded in the title by his only surviving son, Reginald Baliol Brett (*b.* 1852), who was secretary to the office of works from 1895 to 1902, but subsequently came into far greater public prominence in 1904 as Chairman of the war office reconstitution committee after the South African War.

ESHER, a township in the Epsom parliamentary division of Surrey, England, 14½ m. S.W. of London by the London & South Western railway (Esher and Claremont station). It is pleasantly situated on rising ground above the river Mole, 3 m. from its junction with the Thames. To the north-west lie the grounds of Esher Place. Of the mansion-house founded by William of Waynflete, bishop of Winchester (*c.* 1450), in which Cardinal Wolsey resided for three or four weeks after his sudden fall from power in 1529, only the gatehouse remains. It is known as Wolsey's Tower, but is apparently part of Waynflete's foundation. A new mansion was erected in 1803. To the south is Claremont

Palace, built by the great Lord Clive (1769) on the site of a mansion of Sir John Vanbrugh. In 1816 it was the residence of Princess Charlotte, wife of Prince (afterwards King) Leopold. She died here in 1817, and on the death of her husband in 1865 the property passed to the crown. Louis Philippe, ex-king of the French, resided here from 1848 until his death in 1850. In 1882 Claremont became the private property of Queen Victoria. Christ Church, Esher, contains fine memorials of King Leopold and others, and one of its three bells is said to have been brought from San Domingo by Sir Francis Drake. To the north near the railway station is Sandown Park, where important race meetings are held. Esher is included in the urban district of Esher and The Dittons, of which Thames Ditton is a favourite riverside resort. The whole district is largely residential. Pop. (1901) 9489.

ESKER (O. Irish *eiscir*), a local name for long mounds of glacial gravel frequently met with in Ireland. Eskers (the Swedish *åsar*) are among the occasionally puzzling relics of the British glacial period. They wind from side to side across glaciated country and have evidently been formed by channels upon or under the ice. “Where streams of considerable size form tunnels under or in the ice these may become more or less filled with wash, and when the ice melts the aggraded channels appear as long ridges of gravel and sand known as *eskers*. It has been thought that similar ridges are sometimes formed in valleys cut in the ice from top to bottom, and even that they rise from gravel and sand lodged in super-glacial channels. The latter at least is probably rare, as the surface streams have usually high gradients, swift currents and smooth bottoms, and hence give little opportunity for lodgment. In the case of ice-sheets, too, in which eskers are chiefly developed, there is usually no surface material except at the immediate edge, where the ice is thin and its layers upturned” (T.C. Chamberlin and R.D. Salisbury, *Geology, Processes and their Results*). Eskers are to be distinguished from kames (*q.v.*).

ESKILSTUNA, a town of Sweden in the district (*län*) of Södermanland, on the Hjelmar river, which unites lakes Hjelmar and Mälar, 65 m. W. of Stockholm by rail. Pop. (1900) 13,663. The place is mentioned in the 13th century, and is said to derive its name from Eskil, an English missionary who suffered martyrdom on the spot. It rose into importance in the reign of Charles X., who bestowed on it considerable privileges, and gave the first impulse to its manufacturing activity. It is the chief seat in Sweden of the iron and steel industries, its cutlery being especially noted, while damascened work is a specialty. There is a technical school for the metal industries. There are, in the town or its neighbourhood, great engineering, gun-making, and rolling and polishing works and breweries. The largest mechanical works are those of Munktell and Tunafors. The Karl Gustaf Stads rifle factory was established in 1814.

ESKIMO, Eskimos or Esquimaux (a corruption of the Abnaki Indian *Eskimantsic* or the Ojibway *Ashkimeq*, both terms meaning “those who eat raw flesh”: they call themselves “Innuit,” “the people”), a North American Indian people, inhabiting the arctic coast of America from Greenland to Alaska, and a small portion of the Asiatic shore of Bering Strait. On the American shores they are found, in broken tribes, from East Greenland to the western shores of Alaska—never far inland, or south of the region where the winter ice allows seals to congregate. Even on hunting expeditions they never travel more than 30 m. from the coast. Save a slight admixture of European settlers, they are the only inhabitants of both sides of Davis Strait and Baffin Bay. They extend as far south as about 50° N. lat. on the eastern side of America, and in the west to 60° on the eastern shore of Bering Strait, while 55° to 60° are their southern limits on the shore of Hudson Bay. Throughout all this range there are no other tribes save where the Kennayan and Ugalenze Indians (of western America) come down to the shore to fish. The Aleutians are closely allied to the Eskimo in habits and language. H.J. Rink divides the Eskimo into the following groups, the most eastern of which would have to travel nearly 5000 m. to reach the most western: (1) The East Greenland Eskimo, few in number, every year advancing farther south, and coming into contact with the next section. (2) The West Greenlanders, civilized, living under the Danish crown, and extending from Cape Farewell to 74° N. lat. (3) The Northern-most Greenlanders—the Arctic Highlanders of Sir John Ross—confined to Smith, Whale, Murchison and Wolstenholme Sounds, north of the Melville Bay glaciers. These—the most isolated and uncivilized of all the Eskimo—had no boats or bows and arrows until about 1868. (4) The Labrador Eskimo, mostly civilized. (5) The Eskimo of the middle regions, occupying the coasts from

Hudson Bay to Barter Island, beyond Mackenzie river, inhabiting a stretch of country 2000 m. in length and 800 in breadth. (6) The Western Eskimo, from Barter Island to the western limits in America. (7) The Asiatic Eskimo.

The Eskimo are not a tall race, their height varying from 5 ft. 4 in. to 5 ft. 10 in., but men of 6 ft. are met. Both men and women are muscular and active, the former often inclining to fat. The faces of both have a pleasing, good-humoured expression, and not infrequently are even handsome. The typical face is broadly oval, flat, with fat cheeks; forehead not high, and rather retreating; teeth good, though, owing to the character of the food, worn down to the gums in old age; nose very flat; eyes rather obliquely set, small, black and bright; head largish, and covered with coarse black hair, which the women fasten up into a knot on the top, and the men clip in front and allow to hang loose and unkempt behind. Their skulls are of the mesocephalic type, the height being greater than the breadth; according to Davis, 75 is the index of the latter and 77 of the former. Some of the tribes slightly compress the skulls of their new-born children laterally (Hall), but this practice is a very local one. The men have usually a slight moustache, but no whiskers, and rarely any beard. The skin has generally a “bacony” feel, and when cleaned of the smoke, grease and other dirt—the accumulation of which varies according to the age of the individual—is only so slightly brown that red shows in the cheeks of the children and young women. The hands and feet are small and well formed. The Eskimo dress entirely in skins of the seal, reindeer, bear, dog, or even fox, the first two being, however, the most common. The men’s and women’s dress is much the same, a jacket suit, the trousers tucked into seal-skin boots. The jacket has a hood, which in cold weather is used to cover the head, leaving only the face exposed. The women’s jacket has a large hood for carrying a child and an absurd-looking tail behind, which is, however, usually tucked up. The women’s trousers are usually ornamented with eider-duck neck feathers or embroidery of native dyed leather; their boots, which are of white leather, or (in Greenland) dyed of various colours, reach over the knees, and in some tribes are very wide at the top, thus giving them an awkward appearance and a clumsy waddling walk. In winter two suits are worn, one with the hair inside, the other with it outside. They also sometimes wear shirts of bird-skins, and stockings of dog or young reindeer skins. Their clothes are very neatly made, fit beautifully, and are sewn with “sinew-thread,” with a bone needle if a steel one cannot be had. In person the Eskimo are usually filthy, and never wash. Infants are, however, sometimes cleaned by being licked by their mother before being put into the bag of feathers which serves as their bed, cradle and blankets.

In summer the Eskimo live in conical skin tents, and in winter usually in half-underground huts of stone, turf, earth and bones, entered by a long tunnel-like passage, which can only be traversed on all fours. Sometimes, if residing temporarily at a place, they will erect neat round huts of blocks of snow with a sheet of ice for a window. In the roof are deposited their spare harpoons, &c; and from it is suspended the steatite basin-like lamp, the flame of which, the wick being of moss, serves as fire and light. On one side of the hut is the bench which is used as sofa, seats and common sleeping place. The floor is usually very filthy, a pool of blood or a dead seal being often to be seen there. Ventilation is almost non-existent; and after the lamp has blazed for some time, the heat is all but unbearable. In the summer the wolfish-looking dogs lie outside on the roof of the huts, in the winter in the tunnel-like passage just outside the family apartment. The Western Eskimo build their houses chiefly of planks, merely covered on the outside with green turf. The same Eskimo have, in the more populous places, a public room for meetings. “Council chambers” are also said to exist in Labrador, but are only known in Greenland by tradition. Sometimes in south Greenland and in the Western Eskimo country the houses are made to accommodate several families, but as a rule each family has a house to itself.

The Eskimo are solely hunters and fishers, and derive most of their food from the sea. Their country allows of no cultivation; and beyond a few berries, roots, &c., they use no vegetable food. The seal, the reindeer and the whale supply the bulk of their food, as well as their clothing, light, fuel, and frequently also, when driftwood is scarce or unavailable, the material for various articles of domestic economy. Thus the Eskimo canoe is made of seal-skin stretched on a wooden or whalebone frame, with a hole in the centre for the paddler. It is driven by a bone-tipped double-bladed paddle. A waterproof skin or entrail dress is tightly fastened round the mouth of the hole so that, should the canoe overturn, no water can enter. A skilful paddler can turn a complete somersault, boat and all, through the water. The Eskimo women use a flat-bottomed skin luggage-boat. The Eskimo sledge is made of two runners of wood or bone—even, in one case on record, of frozen salmon (Maclure)—united by cross bars tied to the runners by hide thongs, and drawn by from 4 to 8 dogs harnessed abreast. Some of their weapons are ingenious—in particular, the harpoon, with its detachable point to which an inflated sealskin is fastened. When the quarry is struck, the floating skin serves to tire it out, marks its course, and buoys it up when dead. The bird-spears, too, have a bladder attached, and points at the sides which strike the creature should the spear-head fail to wound. An effective bow is made out of whale’s rib. Altogether, with meagre material the Eskimo show great skill in the manufacture of their weapons. Meat is sometimes boiled, but, when it is frozen, it is often eaten raw. Blood, and the half-digested contents of the reindeer’s paunch, are also eaten; and sometimes, but not habitually, blubber. As a rule this latter is too precious: it must be kept for winter fuel and light. The Eskimo are enormous eaters; two will easily dispose of a seal at a sitting; and in Greenland, for instance, each individual has for his daily consumption, on an average, 2½ ℔ of flesh with blubber, and 1 ℔ of fish, besides mussels, berries, sea-weed, &c., to which in the Danish settlements may be added 2 oz. of imported food. Ten pounds of flesh, in addition to other food, is not uncommonly

consumed in a day in time of plenty. A man will lie on his back and allow his wife to feed him with tit-bits of blubber and flesh until he is unable to move.

The Eskimo cannot be strictly called a wandering race. They are nomadic only in so far that they have to move about from place to place during the fishing and shooting season, following the game in its migrations. They have, however, no regular property. They possess only the most necessary utensils and furniture, with a stock of provisions for less than one year; and these possessions never exceed certain limits fixed upon by tradition or custom. Long habit and the necessities of their life have also compelled those having food to share with those having none—a custom which, with others, has conduced to the stagnant conditions of Eskimo society and to their utter improvidence.

Their intelligence is considerable, as their implements and folk-tales abundantly prove. They display a taste for music, cartography and drawing, display no small amount of humour, are quick at picking up peculiar traits in strangers, and are painfully acute in detecting the weak points or ludicrous sides of their character. They are excellent mimics and easily learn the dances and songs of the Europeans, as well as their games, such as chess and draughts. They gamble a little—but in moderation, for the Eskimo, though keen traders, have a deep-rooted antipathy to speculation. When they offer anything for sale—say at a Danish settlement in Greenland—they always leave it to the buyer to settle the price. They have also a dislike to bind themselves by contract. Hence it was long before the Eskimo in Greenland could be induced to enter into European service, though when they do they pass to almost the opposite extreme—they have no will of their own. Public licentiousness or indecency is rare among them. In their private life their morality is, however, not high. The women are especially erring; and in Greenland, at places where strangers visit, their extreme laxity of morals, and their utter want of shame, are not more remarkable than the entire absence of jealousy or self-respect on the part of their countrymen and relatives. Theft in Greenland is almost unknown; but the wild Eskimo make very free with strangers' goods—though it must be allowed that the value they attach to the articles stolen is some excuse for the thieves. Among themselves, on the other hand, they are very honest—a result of their being so much under the control of public opinion. Lying is said to be as common a trait of the Eskimo as of other savages in their dealings with Europeans. They have naturally not made any figure in literature. Their folk-lore is, however, extensive, and that collected by Dr Rink shows considerable imagination and no mean talent on the part of the story-tellers. In Greenland and Labrador most of the natives have been taught by the missionaries to read and write in their own language. Altogether, the literature published in the Eskimo tongue is considerable. Most of it has been printed in Denmark, but some has been "set up" in a small printing-office in Greenland, from which about 280 sheets have issued, beside many lithographic prints. A journal (*Atuagagldliutit nalinginarmik tusaruminásassumik univkat*, *i.e.* "something for reading, accounts of all entertaining subjects") has been published since 1861.

The Eskimo in Greenland and Labrador are, with few exceptions, nominally at least, Christians. The native religion is a vague animism, and consists of a belief in good and evil spirits, limited each to its own sphere; in a Heaven and Hell; and a childish faith is placed in the native wizards, who are regarded as intermediaries between mankind and the spirit-powers. The worship of the whale-spirit, so important a factor in their daily economy, is prevalent.

As regards language, the idiom spoken from Greenland to north-eastern Siberia is, with a few exceptions, the same; any difference is only that of dialect. It differs from the whole group of European languages, not merely in the sound of the words, but more especially, according to Rink, in the construction. Its most remarkable feature is that a sentence of a European language is expressed in Eskimo by a single word constructed out of certain elements, each of which corresponds in some degree to one of our words. One specimen commonly given to visitors to Greenland may suffice: *Savigiksiniariartokasuaromaryotittogog*, which is equivalent to "He says that you also will go away quickly in like manner and buy a pretty knife." Here is one word serving in the place of 17. It is made up as follows: *Savig* a knife, *ik* pretty, *sini* buy, *ariartok* go away, *asuar* hasten, *omar* wilt, *y* in like manner, *otit* thou, *tog* also, *og* he says.

The Eskimo have no chiefs or political and military rulers. Fabricius concisely described them in his day: "*Sine Deo, domino, reguntur consuetudine*." The government is mainly a family one, though a man distinguished for skill in the chase, and for strength and shrewdness, often has considerable power in the village. No political or social tie is recognized between the villages, though general good-fellowship seems to mark their relations. They never go to war with each other; and though revengeful and apt to injure an enemy secretly, they rarely come to blows, and are morbidly anxious not to give offence. Indeed, in their intercourse with each other, all Eskimo indulge in much hyperbolical compliment. But they are not without courage. On the Coppermine and Mackenzie rivers, where they sometimes come into collision with their American-Indian kinsmen, they fight fiercely. Polygamy is rare, but the rights of divorce and re-marriage are unrestricted. The Eskimo have intricate rules governing the ownership of property and the rights of the hunter. As a race they are singularly undemonstrative. When they met each other they used to rub noses together, but this, though a common custom still among the wild Eskimo, is entirely abandoned in Greenland except for the petting of children. There is, in Greenland at least, no national mode of salutation, either on meeting or parting. When a guest enters a house, commonly not the least sign is made either by him or his host. On leaving a place they sometimes say "inûvdluaritse," *i.e.* live well, and to a European "aporniakinatit," *i.e.* do not hurt thy head, viz. against the upper part of the doorway. The Eskimo, excluding the few on the Asiatic coast, are estimated at about 29,000.

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ESKI-SHEHR, a town of Asia Minor, in the Kutaiah sanjak of the Brusa (Khudavendikiar) vilayet. It is a station on the Haidar Pasha-Angora railway, 194½ m. from the former and 164 m. from Angora, and the junction for Konia; and is situated on the right bank of the Pursak Su (*Tembris*), a tributary of the Sakaria, at the foot of the hills that border the broad treeless valley. Pop. 20,000 (Moslems 15,000, Christians 5000). Eski-Shehr, *i.e.* "the old town," lies about a mile from the ruins of the ancient Phrygian Dorylaeum. The latter is mentioned in connexion with the wars of Lysimachus and Antigonus (about 302 B.C.), and frequently figures in Byzantine history as an imperial residence and military rendezvous. It was the scene of the defeat of the Turks under Kilij-Arslan by the crusaders in 1097, and fell finally to the Turks of Konia in 1176. The town is divided by a small stream into a commercial quarter on low ground, in which are the bazaars, khans and the hot sulphur springs (122° F.) which are mentioned as early as the 3rd century by Athenaeus; and a residential quarter on the higher ground. The town is noted for its good climate, the Pursak Su for the abundance of its fish, and the plain for its fertility. About 18 m. to the E. are extensive deposits of meerschaum. The clay is partly manufactured into pipes in the town, but the greater proportion finds its way to Europe and especially to Germany. The annual output is valued at £272,000.

See Murray's *Hdbk. to Asia Minor* (1893); V. Cuinet, *Turquie d'Asie* (Paris, 1894).

ESMARCH, JOHANNES FRIEDRICH AUGUST VON (1823-1908), German surgeon, was born at Tönning, in Schleswig-Holstein, on the 9th of January 1823. He studied at Kiel and Göttingen, and in 1846 became B.R.K. von Langenbeck's assistant at the Kiel surgical hospital. He served in the Schleswig-Holstein War of 1848 as junior surgeon, and this directed his attention to the subject of military surgery. He was taken prisoner, but afterwards exchanged, and was then appointed as surgeon to a field hospital. During the truce of 1849 he qualified as *Privatdocent* at Kiel, but on the fresh outbreak of war he returned to the troops and was promoted to the rank of senior surgeon. In 1854 he became director of the surgical clinic at Kiel, and in 1857 head of the general hospital and professor at the university. During the Schleswig-Holstein War of 1864 Esmarch rendered good service to the field hospitals of Flensburg, Sundewitt and Kiel. In 1866 he was called to Berlin as member of the hospital commission, and also to take the superintendence of the surgical work in the hospitals there. When the Franco-German War broke out in 1870 he was appointed surgeon-general to the army, and afterwards consulting surgeon at the great military hospital near Berlin. In 1872 he married Princess Henrietta of Schleswig-Holstein-Sonderburg-Augustenburg, aunt of the Empress Auguste Victoria. In 1887 a patent of nobility was conferred on him. He died at Kiel on the 23rd of February 1908. Esmarch was one of the greatest authorities on hospital management and military surgery. His *Handbuch der kriegschirurgischen Technik* was written for a prize offered by the empress Augusta, on the occasion of the Vienna Exhibition of 1877, for the best handbook for the battlefield of surgical appliances and operations. This book is illustrated by admirable diagrams, showing the different methods of bandaging and dressing, as well as the surgical operations as they occur on the battlefield. Esmarch himself invented an apparatus, which bears his name, for keeping a limb nearly bloodless during amputation. No part of Esmarch's work is more widely known than that which deals with "First Aid," his *First Aid on the Battlefield* and *First Aid to the Injured* being popular manuals on the subject. The latter is the substance of a course of lectures delivered by him in 1881 to a "Samaritan School," the first of the kind in Germany, founded by Esmarch in 1881, in imitation of the St John's Ambulance classes which had been organized in England in 1878. These lectures were very generally adopted as a manual for first aid students, edition after edition having been called for, and they have been translated into numerous languages, the English version being the work of H.R.H. Princess Christian. No ambulance course would be complete without a demonstration of the Esmarch bandage. It is a three-sided piece of linen or cotton, of which the base measures 4 ft. and the sides 2 ft. 10 in. It can be used folded or open, and applied in thirty-two different ways. It answers every purpose for temporary dressing and field-work, while its great recommendation is that the means for making it are always at hand.

ESNA, or Esneh, a town of Upper Egypt on the W. bank of the Nile, 454 m. S.S.E. of Cairo by rail, the railway station being on the opposite side of the river. Pop. (1897) 16,000, mostly Copts. Esna, one of the healthiest towns in Egypt, is noted for its manufactures of pottery and its large grain and live stock markets. It formerly had a large trade with the Sudan. A caravan road to the south goes through the oasis of Kurkur. The trade, almost stopped by the Mahdist Wars, is now largely diverted by railway and steamboat routes. There is, however, considerable traffic with the oasis of Kharga, which lies almost due west of the town. Nearly in the centre of the town is the Ptolemaic and Roman temple of the ram-headed Khnūm, almost buried in rubbish and houses. The interior of the pronaos is accessible to tourists, and contains the latest known hieroglyphic inscription, dating from the reign of Decius (A.D. 249-251). With Khnūm are associated the goddesses Sati and Neith. In the neighbourhood are remains of Coptic buildings, including a subterranean church (discovered 1895) in the desert half a mile beyond the limits of cultivation. The name Esna is from the Coptic *Sne*. By the Greeks the place was called Latopolis, from the worship here of the latus fish. In the persecutions under Diocletian A.D. 303, the Christians of Esna, a numerous body, suffered severely. In later times the town frequently served as a place of refuge for political exiles. The so-called Esna barrage across the Nile (built 1906-1908) is 30 m. higher up stream at Edfu.

ESOTERIC, having an inner or secret meaning. This term, and its correlative “exoteric,” were first applied in the ancient Greek mysteries to those who were initiated (ἔσω, within) and to those who were not (ἔξω, outside), respectively. It was then transferred to a supposed distinction drawn by certain philosophers between the teaching given to the whole circle of their pupils and that containing a higher and secret philosophy which was reserved for a select number of specially advanced or privileged disciples. This distinction was ascribed by Lucian (*Vit. Auct.* 26) to Aristotle (*q.v.*), who, however, uses ἐξωτερικοὶ λόγοι (*Nic. Ethics*) merely of “popular treatises.” It was probably adopted by the Pythagoreans and was also attributed to Plato. In the sense of mystic it is used of a secret doctrine of theosophy, supposed to have been traditional among certain disciples of Buddhism.

ESPAGNOLS SUR MER, LES, the name given to the naval victory gained by King Edward III. of England over a Spanish fleet off Winchelsea, on the 29th of August 1350. Spanish ships had fought against England as the allies or mercenaries of France, and there had been instances of piratical violence between the trading ships of both nations. A Spanish merchant fleet was loading cargoes in the Flemish ports to be carried to the Basque coast. The ships were armed and had warships with them. They were all under the command of Don Carlos de la Cerda, a soldier of fortune who belonged to a branch of the Castilian royal family. On its way to Flanders the Spanish fleet had captured a number of English trading ships, and had thrown the crews overboard. Piratical violence and massacre of this kind was then universal on the sea. On the 10th of August, when the king was at Rotherhithe, he announced his intention of attacking the Spaniards on their way home. The rendezvous of his fleet was at Winchelsea, and thither the king went by land, accompanied by his wife and her ladies, by his sons, the Black Prince and John of Gaunt, as well as by many nobles. The ladies were placed in a convent and the king embarked on his flagship, the “Cog Thomas,” on the 28th of August. The English fleet did not put to sea but remained at anchor, waiting for the appearance of the Spaniards. Its strength is not known with certainty, but Stow puts it at 50 ships and pinnaces. Carlos de la Cerda was obviously well disposed to give the king a meeting. He might easily have avoided the English if he had kept well out in the Channel. But he relied on the size and strength of his 40 large ships, and in expectation of an encounter had recruited a body of mercenaries—mostly crossbowmen —in the Flemish ports. In the afternoon of the 29th of August he bore down boldly on King Edward’s ships at anchor at Winchelsea. When the Spaniards hove in sight, the king was sitting on the deck of his ship, with his knights and nobles, listening to his minstrels who played German airs, and to the singing of Sir John Chandos. When the look-out in the tops reported the enemy in sight, the king and his company drank to one another’s health, the trumpet was sounded, and the whole line stood out. All battles at that time, whether on land or sea, were finally settled by stroke of sword. The English steered to board the Spaniards. The king’s own ship was run into by one of the enemy with such violence that both were damaged, and she began to sink. The Spaniard stood on, and the “Cog Thomas” was laid alongside another, which was carried by boarding. It was high time, for the king and his following had barely reached the deck of the Spaniard before the “Cog Thomas” went to the bottom. Other Spaniards were taken, but the fight was hot. La Cerda’s crossbowmen did much execution, and the higher-built Spaniards were able to drop bars of iron or other weights on the lighter English vessels, by which they were damaged. The conflict was continued till twilight. At the close the large English vessel called “La Salle du Roi,” which carried the king’s household, and was

commanded by the Fleming, Robert of Namur, afterwards a knight of the Garter, was grappled by a big Spaniard, and was being dragged off by him. The crew called loudly for a rescue, but were either not heard or, if heard, could not be helped. The “Salle du Roi” would have been taken if a Flemish squire of Robert of Namur, named Hannequin, had not performed a great feat of arms. He boarded the Spaniard and cut the halyards of her mainsail with his sword. The Spanish ship was taken. King Edward is said to have captured 14 of the enemy. What his own loss was is not stated, but as his own vessel, and also the vessel carrying the Black Prince, were sunk, and from the peril of “La Salle du Roi,” we may conclude that the English fleet suffered heavily. There was no pursuit, and a truce was made with the Basque towns the next year.

The battle with “the Spaniards on the sea” is a very typical example of a medieval sea-fight, when the ships were of the size of a small coaster or a fishing smack, were crowded with men, and when the personal prowess of a single knight or squire was an important element of strength.

The only real authority for the battle is Froissart, who was at different times in the service of King Edward or of his wife, Philippa of Hainaut, and of the counts of Namur. He repeated what was told him by men who had been present, and dwells as usual on the “chivalry” of his patrons. See his *Chroniques*, iv. 91.

(D. H.)

ESPALIER (a French word, derived from the Ital. *spalliera*, something to rest the *spalla* or shoulder against; the word is ultimately the same as *épaulière*, a shoulder-piece), a lattice-work or row of stakes, originally shoulder high, on which fruit trees, shrubs and flowers, particularly roses and creepers, are trained. Espaliers are usually made of larch or other wood, iron and metal rails being too great conductors of heat and cold. The advantage of this method of training is that the fruit, &c, is more easily got at, and while protected from wind, is freely exposed to sun and air, and not so open to extreme changes of temperature as when trained on a wall. (See HORTICULTURE.)

ESPARTERO, BALDOMERO (1792-1879), duke of Vitoria, duke of Morella, prince of Vergara, Count Luchana, knight of the Toison d’Or, &c. &c., Spanish soldier and statesman, was born at Granatulu, a town of the province of Ciudad Real, on the 27th of February 1792. He was the ninth child of a carter, who wanted to make him a priest, but the lad at fifteen enlisted in a battalion of students to fight against the armies of Napoleon I. In 1811 Espartero was appointed a lieutenant of Engineers in Cadiz, but having failed to pass his examination he entered a line regiment. In 1815 he went to America as a captain under General Morillo, who had been made commander-in-chief to quell the risings of the colonies on the Spanish Main. For eight years Espartero distinguished himself in the struggle against the colonists. He was several times wounded, and was made major and colonel on the battlefields of Cochabamba and Sapachni. He had to surrender to Sucre at the final battle of Ayacucho, which put an end to Castilian rule. He returned to Spain, and, like most of his companions in arms, remained under a cloud for some time. He was sent to the garrison town of Logroño, where he married the daughter of a rich landowner, Doña Jacinta Santa Cruz, who eventually survived him. Henceforth Logroño became the home of the most prominent of the Spanish political generals of the 19th century. Espartero became in 1832, on the death of King Ferdinand VII., one of the most ardent defenders of the rights of his daughter, Isabella II. The government sent him to the front, directly the Carlist War broke out, as commandant of the province of Biscay, where he severely defeated the Carlists in many encounters. He was quickly promoted to a divisional command, and then made a lieutenant-general. At times he showed qualities as a *guerillero* quite equal to those of the Carlists, like Zumalacarregui and Cabrera, by his daring marches and surprises. When he had to move large forces he was greatly superior to them as an organizer and strategist, and he never disgraced his successes by cruelty or needless severity. Twice he obliged the Carlists to raise the siege of Bilbao before he was appointed commander-in-chief of the northern army on the 17th of September 1836, when the tide of war seemed to be setting in favour of the pretender in the Basque provinces and Navarre, though Don Carlos had lost his ablest lieutenant, the Basque Zumalacarregui. His military duties at the head of the principal national army did not prevent Espartero from showing for the first time his political ambition. He displayed such radical and reforming inclinations that he laid the foundations of his popularity among the lower and middle classes, which lasted more than a quarter of a century, during which time the Progressists, Democrats and advanced Liberals ever looked to him as a leader and adviser. In November 1836 he again forced the Carlists to raise the siege of Bilbao. His troops included the British legion under Sir de Lacy Evans. This success turned the tide of war against Don Carlos, who vainly attempted a raid towards Madrid. Espartero was soon at his heels, and obliged him to hurry northwards, after several defeats. In 1839 Espartero carefully opened up negotiations with Maroto and the principal Carlist chiefs of the Basque provinces. These ended in

their accepting his terms under the famous convention of Vergara, which secured the recognition of their ranks and titles for nearly 1000 Carlist officers. Twenty thousand Carlist volunteers laid down their arms at Vergara; only the irreconcilables led by Cabrera held out for a while in the central provinces of Spain. Espartero soon, however, in 1840, stamped out the last embers of the rising, which had lasted seven years. He was styled “El pacificador de España,” was made a grandee of the first class, and received two dukedoms.

During the last three years of the war Espartero, who had been elected a deputy, exercised from his distant headquarters such influence over Madrid politics that he twice hastened the fall of the cabinet, and obtained office for his own friends. At the close of the war the queen regent and her ministers attempted to elbow out Espartero and his followers, but a *pronunciamiento* ensued in Madrid and other large towns which culminated in the marshal’s accepting the post of prime minister. He soon became virtually a dictator, as Queen Christina took offence at his popularity and resigned, leaving the kingdom very soon afterwards. Directly the Cortes met they elected Espartero regent by 179 votes to 103 in favour of Arguelles, who was appointed guardian of the young queen. For two years Espartero ruled Spain in accordance with his Radical and conciliatory dispositions, giving special attention to the reorganization of the administration, taxation and finances, declaring all the estates of the church, congregations and religious orders to be national property, and suppressing the *diezma*, or tenths. He suppressed the Republican risings with as much severity as he did the military *pronunciamientos* of Generals Concha and Diego de Leon. The latter was shot in 773
Madrid. Espartero crushed with much energy a revolutionary rising in Barcelona, but on his return to Madrid was so coldly welcomed that he perceived that his prestige was on the wane. The advanced Progressists coalesced with the partisans of the ex-regent Christina to promote *pronunciamientos* in Barcelona and many cities. The rebels declared Queen Isabel of age, and, led by General Narvaez, marched upon Madrid. Espartero, deeming resistance useless, embarked at Cadiz on the 30th of July 1843 for England, and lived quietly apart from politics until 1848, when a royal decree restored to him all his honours and his seat in the senate. He retired to his house in Logroño, which he left six years later, in 1854, when called upon by the queen to take the lead of the powerful Liberal and Progressist movement which prevailed for two years. The old marshal vainly endeavoured to keep his own Progressists within bounds in the Cortes of 1854-1856, and in the great towns, but their excessive demands for reforms and liberties played into the hands of a clerical and reactionary court and of the equally retrograde governing classes. The growing ambition of General O’Donnell constantly clashed with the views of Espartero, until the latter, in sheer disgust, resigned his premiership and left for Logroño, after warning the queen that a conflict was imminent between O’Donnell and the Cortes, backed by the Progressist militia. O’Donnell’s *pronunciamiento* in 1856 put an end to the Cortes, and the militia was disarmed, after a sharp struggle in the streets of the capital. After 1856 Espartero resolutely declined to identify himself with active politics, though at every stage in the onward march of Spain towards more liberal and democratic institutions he was asked to take a leading part. He refused to allow his name to be brought forward as a candidate when the Cortes of 1868, after the Revolution, sought for a ruler. Espartero, strangely enough, adopted a laconic phrase when successive governments on their advent to power invariably addressed themselves to the venerable champion of liberal ideas. To all—to the Revolution of 1868, the Constituent Cortes of 1869, King Amadeus, the Federal Republic of 1873, the nameless government of Marshal Serrano in 1874, the Bourbon restoration in 1875—he simply said: “Cumplase la voluntad nacional” (“Let the national will be accomplished”). King Amadeus made him prince of Vergara. The Restoration raised a statue to him near the gate of the Retiro Park in Madrid. Spaniards of all shades, except Carlists and Ultramontanes, paid homage to his memory when he passed away at his Logroño residence on the 8th of January 1879. His tastes were singularly modest, his manners rather reserved, but always kind and considerate for humble folk. He was a typical Spanish soldier-politician, though he had more of the better traits of the soldier born and bred than of the arts of the statesman. His military instincts did not always make it easy for him to accommodate himself to courtiers and professional politicians.

(A. E. H.)

ESPARTO, or Spanish Grass, *Stipa tenacissima*, a grass resembling the ornamental feather-grass of gardens. It is indigenous to the south of Spain and the north of Africa (where it is known as Halfa or Alfa), and is especially abundant in the sterile and rugged parts of Murcia and Valencia, and in Algeria, flourishing best in sandy, ferruginous soils, in dry, sunny situations on the sea coast. Pliny (*N.H.* xix. 2) described what appears to have been the same plant under the name of *spartum*, whence the designation *campus spartarius* for the region surrounding New Carthage. It attains a height of 3 or 4 ft. The stems are cylindrical, and clothed with short hair, and grow in clusters of from 2 to 10 ft. in circumference; when young they serve as food for cattle, but after a few years’ growth acquire great toughness of texture. The leaves vary from 6 in. to 3 ft. in length, and are grey-green in colour; on account of their tenacity of fibre and flexibility they have for centuries been employed for the making of ropes, sandals, baskets, mats and other articles. Ships’ cables of esparto, being light, have the quality of floating on water, and have long been in use in the Spanish navy.

Esparto leaves contain 56% by weight of fibre, or about 10% more than straw, and hence have

come into requisition as a substitute for linen rags in the manufacture of paper. For this purpose they were first utilized by the French, and in 1857 were introduced into Great Britain. When required for paper-making the leaves should be gathered before they are quite matured; if, however, they are obtained too young, they furnish a paper having an objectionable semi-transparent appearance. The leaves are gathered by hand, and from 2 to 3 cwt. may be collected in a day by a single labourer. They are generally obtained during the dry summer months, as at other times their adherence to the stems is so firm as often to cause the uprooting of the plants in the attempt to remove them. Esparto may be raised from seed, but cannot be harvested for twelve or fifteen years after sowing.

Another grass, *Lygeum Spartum*, with stiff rush-like leaves, growing in rocky soil on the high plains of countries bordering on the Mediterranean, especially of Spain and Algeria, is also a source of esparto.

For the processes of the paper manufacturer esparto is used in the dry state, and without cutting; roots and flowers and stray weeds are first removed, and the material is then boiled with caustic soda, washed, and bleached with chlorine solution. Sundry experiments have been made to adapt esparto for use in the coarser textile fabrics. Messrs A. Edger and B. Proctor in 1877 directed attention to the composition of the slag resulting from the burning of esparto, which they found to be strikingly similar to that of average medical bottle glass, the latter yielding on analysis 66.3% of silica and 25.1% of alkalies and alkaline earths, and the slag 64.6 and 27.45% of the same respectively.

ESPERANCE, a small seaport on a fine natural harbour on the south coast of West Australia, 275 m. north-east from Albany. It is a summer resort, and in the neighbourhood are interesting caves. Its importance as a seaport is due to its being on the high road between the eastern states and the gold-fields, and the nearest place for the shipment of gold from the Coolgardie fields.

ESPERANTO, an artificial international auxiliary language (see Universal Languages), first published in 1887, seven years after the appearance of its predecessor Volapük (*q.v.*), which it has now completely supplanted. Its author was a Russian physician, Dr L. Zamenhof, born in 1859 at Bielostok, where the spectacle of the feuds of the four races—each speaking different languages—which inhabit it (Russians, Poles, Germans and Jews) at an early date suggested to him the idea of remedying the evil by the introduction of a neutral language, standing apart from the existing national languages. His first idea was to resuscitate some dead language. Then he tried to construct a new language on an a priori basis. At the same time he made what he appears to have considered the great discovery that the bulk of the vocabulary of a language consists not of independent roots, but of compounds and derivatives formed from a comparatively small number of roots.

At first he tried to construct his roots a priori by arbitrary combinations of letters. Then he fell back on the plan of taking his roots ready-made from existing languages, as the inventor of Volapük had done before him. But instead of taking them mainly from one language, he has selected them from the chief European languages, but not impartially. Like all inventors of artificial languages, he is more ready to experiment with foreign languages than with his own; and hence the Slavonic roots in Esperanto are much less numerous than those taken from the other European languages. Here his choice has been to some extent guided by considerations of internationality, although he has not fully grasped the importance of the principle of maximum internationality, so well worked out in the latest rival of Esperanto—Idiom Neutral (see Universal Languages). Thus he adopts a large number of international words—generally unaltered except in spelling—such as *teatr*, *tabak*, even when it would be easy to form equivalent terms from the roots already existing in the language. Where there is no one international word, he selects practically at random, keeping, however, a certain balance between the Romance words, taken chiefly from Latin (*tamen*) and French (*trotuar*), on the one hand, and the Germanic on the other hand, the latter being taken sometimes from German (*nur*, “only”), sometimes from English, the words being generally written more or less phonetically (*rajt* = right). Most of the Germanic words are badly chosen from the international point of view. Thus the German word quoted above would not be intelligible to any one ignorant of German. Indeed, from the international point of view all specially German words ought to be excluded, or else reduced to the common Germanic form; thus *trink* ought to be made into *drink*, the *t* being a specially German modification of the *d*, preserved not only in English but in all the remaining Germanic languages. This incongruous mixture of languages is not only jarring and repulsive, but adds greatly to the difficulty of mastering the vocabulary for the polyglot as well as the monolingual learner.

The inventor has taken great pains to reduce the number of his roots to a minimum; there are 2642 of them in his dictionary, the *Universala Vortaro* (from Ger. *Wort*, “word”), which does not include

such international words as *poezio*, *telefono*; these the learner is supposed to recognize and form without help. The most eccentric feature of the vocabulary, and the one to which it owes much of its brevity, is the extensive use of the prefix *mal-* to reverse the meaning of a word, as in *malamiko*, "enemy," and even *malbona*, "bad."

The phonology of the language is very simple. The vowels are only five in number, *a*, *e*, *i*, *o*, *u*, used without any distinction of quantity, as in Russian. There are six diphthongs, expressed by an unnecessarily complicated notation. The consonant-system is simple enough in itself, but is greatly complicated in writing by the excessive and mostly unnecessary use made of diacritical letters not only for simple sounds but also for consonant-groups. *c* is used for *ts*, as in Polish.

The grammar is, like that of Volapük, partly borrowed from existing languages, partly *a priori* and arbitrary. The use of the final vowels belongs to the latter category. The use of *-a* to indicate adjectives and of *-o* to indicate nouns as in *kara amiko*, "dear (male) friend," is a source of confusion to those familiar with the Romance languages, and has proved a bar to the diffusion of Esperanto among the speakers of these languages. On the other hand, the following paradigm will show how faithfully Esperanto can reproduce the defects of conventional European grammar:—

	Singular.	Plural.
Nominative	*la bona patro*	*la bonaj patroj*
Accusative	*la bonan patron*	*la bonajn patrojn.*

It is difficult to see why the accusative should be kept when all the other cases are replaced by prepositions.

The verb is better than the noun. Its inflections are *-as* present, *-is* preterite, *-os* future, *-us* conditional, *-u* imperative and subjunctive, *-i* infinitive, together with the following participles:—

	Active.	Passive.
Present	*-anta*	*-ata*
Preterite	*-inta*	*-ita*
Future	*-onta*	*-ota*

The inventor has followed the good example of his native language in using *esti*, "to be," as the auxiliary verb both in the passive, where it is combined with passive participles, and in the secondary tenses of the active (perfect, pluperfect, &c.), where it is of course combined with the active participles. The participles can be made into nouns and adverbs by changing the final *-a* into *-o* and *-e* respectively: thus *tenonto*, "the future holder," *perdinte*, "through having lost."

The table of the forty-five correlative pronouns, adjectives and adverbs is also elaborate and ingenious.

Much ingenuity is displayed in the syntax, as well as some happy simplifications. But, on the other hand, there is much in it that is fanciful, arbitrary and vague, as in the use of the definite article—where the author has unfortunately followed French rather than English usage—and in the moods of the verb.

The following specimens will show the general character of this easy-flowing but somewhat heavy and monotonous language—"bad Italian," as it is called by its detractors:—

> Patro nia, kiu estas en la ĉielo, sankta estu via nomo; venu regeco via; estu volo via, kiel en la ĉielo, tiel ankaŭ sur la tero. Panon nian ĉiutagan donu al ni hodiaŭ; kaj pardonu al ni ŝuldojn niajn, kiel ni ankaŭ pardonas al niaj ŝuldantoj; kaj ne konduku nin en tenton, sed liberigu nin de la malbono.

> Estimata Sinjoro. Per tiu ĉi libreto mi havas la honoron prezenti al vi la lingvon internacian Esperanto. Esperanto tute ne havas la intencon malfortigi la lingvon naturan de ia popolo. Ĝi devas nur servi por la rilatoj internaciaj kaj por tiuj verkoj aŭ produktoj, kiuj interesas egale la tutan mondon.

In summing up the merits and defects of Esperanto we must begin by admitting that it is the most reasonable and practical artificial language that has yet appeared. Its inventor has had the double advantage of being able to profit by the mistakes of his predecessors, and of being himself, by force of circumstances, a better linguist. It must further be admitted that he has made as good a use of these advantages as was perhaps possible without systematic training in scientific philology in its widest sense. This last defect explains why the enthusiasm which his work has excited in the great world of linguistic dilettantes has not been shared by the philologists: in spite of its superiority to Volapük, they see in it the same radical defects. Whether they are rash or not in predicting for it a similar fate, remains to be seen. The Esperantists, warned by the fate of Volapük, have adopted the wise policy of suppressing all internal disunion by submitting to the dictatorship of the inventor, and so presenting a united front to the enemy. One thing is clear: either Esperanto must be taken as it is without change, or else it must crumble to pieces; its failure to work out consistently the principle of the maximum of internationality for its root-words is alone enough to condemn it as hopelessly antiquated even from the narrow point of view which regards "international" as synonymous with "European"—a view which political development in the Far East has made equally obsolete.

ESPINAY, TIMOLÉON D' (1580-1644), French soldier, was the eldest of the four sons of François d'Espinay, seigneur de Saint Luc (1554-1597), and was himself marquis de Saint Luc. In 1603 he accompanied Sully in his embassy to London. In 1622, in his capacity as vice-admiral of France, he gained some advantages over the defenders of La Rochelle, obliging the Huguenot commander, Benjamin de Rohan, seigneur de Soubise, to evacuate the islands of Ré and Oléron. In 1627 he was named lieutenant-general of Guienne and marshal of France.

ESPINEL, VICENTE MARTINEZ (1551-1624), Spanish poet and novelist, was baptized on the 28th of December 1551, and educated at Salamanca. He was expelled from the university in 1572, and served as a soldier in Flanders, returning to Spain in 1584 or thereabouts. He took orders in 1587, and four years later became chaplain at Ronda, absented himself from his living, and was deprived of his cure; but his musical skill obtained for him the post of choirmaster at Plasencia. His *Diversas Rìmas* (1591) are undeniably good examples of technical accomplishment and caustic wit. Espinel, however, survives as the author of a clever picaresque novel entitled *Relaciones de la vida del Escudero Marcos de Obregón* (1618). It is, in many passages, an autobiography of Espinel with picturesque embellishments. Marcos is not a chivalresque "esquire," but an adventurer who seeks his fortune by attaching himself to great men; and the object of the author is to warn young men against such a life. Apart from the unedifying confessions of the hero, the book contains curious anecdotes concerning prominent contemporaries, and the episodical stories are told with great spirit; the style is extremely correct, though somewhat diffuse. Le Sage has not scrupled to borrow from *Marcos de Obregón* many of the incidents and characters in *Gil Blas*—a circumstance which induced Isla to give to his Spanish translation of Le Sage's work the jesting title, *Gil Blas restored to his Country and his Native Tongue*. In the 1775 edition of the *Siècle de Louis XIV.* Voltaire grossly exaggerates in saying that *Gil Blas* is taken entirely from *Marcos de Obregón*. Espinel was a clever musician and added a fifth string to the guitar. He revived the measure known as *décimas* or *espinelas*, consisting of a stanza of ten octosyllabic lines. Most of the poems which he left in manuscript remain unpublished owing to their licentious character.

BIBLIOGRAPHY.—J. Perez de Guzmán's edition of *Marcos de Obregón* (Barcelona, 1881) includes a valuable introduction; Léo Claretie, *Le Sage romancier* (Paris, 1890), discusses exhaustively the question of Le Sage's indebtedness to Espinel. For some previously unpublished poems see Pedro Salvá y Mallén, *Catálogo de la biblioteca de Salvá* (Valencia, 1872).

ESPIRITO SANTO, a maritime state of Brazil, bounded N. by Bahia, E. by the Atlantic Ocean, S. by Rio de Janeiro, and W. by Minas Geraes. Pop. (1890) 135,997; (1900) 209,783; area, 17,316 sq. m. With the exception of Sergipe it is the smallest of the Brazilian states. The western border of the state is traversed by low ranges of mountains forming a northward continuation of the Serra do Mar. The longest and most prominent of these ranges, which are for the most part the eastern escarpments of the great Brazilian plateau, is the Serra dos Aymores, which extends along fully two-thirds of the western frontier. Farther S. the ranges are much broken and extend partly across the state toward the seaboard; the more prominent are known as the Serra do Espigão, Serra da Chibata, Serra dos Pilões and Serra dos Purys. The eastern and larger part of the state belongs to the coastal plain, in great part low and swampy, with large areas of sand barrens, and broken by isolated groups and ranges of hills. With the exception of these sandy plains the country is heavily forested, even the mountain sides being covered with vegetation to their summits. The northern and southern parts are fertile, but the central districts are comparatively poor. The coastal plain comprises a sandy, unproductive belt immediately on the coast, back of which is a more fertile tertiary plain, well suited, near the higher country, to the production of sugar and cotton. The inland valleys and slopes are very fertile and heavily forested, and much of the Brazilian export of rosewood and other cabinet woods is drawn from this state. There is only one good bay on the coast, that of Espirito Santo, on which the port of Victoria is situated. The river-mouths are obstructed by sand bars and admit small vessels only. The principal rivers of the state are the Mucury, which rises in Minas Geraes and forms the boundary line with Bahia, the Itaunas, São Domingos, São Matheus, Doce, Timbuhy, Santa Maria, Jucú, Benevente, Itapemirim, and Itabapoana, the last forming the boundary line with Rio de Janeiro.

The Doce, São Matheus, and Itapemirim rise in Minas Geraes and flow entirely across the state. The lower courses of these rivers are generally navigable, that of the Rio Doce for a distance of 90 m. The climate of the coastal zone and deeper valleys is hot, humid and unhealthy, malarial fevers being prevalent. In the higher country the temperature is lower and the climate is healthy. Espirito Santo is almost exclusively agricultural, sugar-cane, coffee, rice, cotton, tobacco, mandioca and tropical fruits being the principal products. Agriculture is in a very backward condition, however, and the state is classed as one of the poorest and most unprogressive in the republic. The rivers and shallow coast waters are well stocked with fish, but there are no fishing industries worthy of mention. There are three railway lines in operation in the state—one running from Victoria to Cachoeira do Itapemirim (50 m.), and thence, by another line, to Santo Eduardo in Rio de Janeiro (58 m.), where connexion is made with the Leopoldina system running into the national capital, and a third running north-westerly from Victoria to Diamantina, Minas Geraes, about 450 m. The chief cities and towns of the state, with their populations in 1890, are Victoria, São Matheus (municipality, 7761) on a river of the same name 16 m. from the sea, Serra (municipality, 6274), Guarapary (municipality, 5310), a small port S. by W. of the capital, Conceicão da Barra (municipality, 5628), the port of São Matheus and Cachoeira do Itapemirim (4049), an important commercial centre in the south.

Espirito Santo formed part of one of the original captaincies which were given to Vasco Fernandes Coutinho by the Portuguese crown. The first settlement (1535) was at the entrance to the bay of Espirito Santo, and its name was afterwards given to the bay and captaincy. It once included the municipality of Campos, now belonging to the state of Rio de Janeiro.

The islands of Trinidade and Martim Vaz, which lie about 715 m. E. of Victoria, belong politically to this state. They are uninhabited, but considerable importance is attached to the former because Great Britain has twice attempted to take possession of it. It rises 1200 ft. above sea-level and is about 6 m. in circumference, but it has no value other than that of an ocean cable station. An excellent description of this singular island is to be found in E.F. Knight's *Cruise of the "Alerte"* (London, 1895).

ESPRONCEDA, JOSÉ IGNACIO JAVIER ORIOL ENCARNACIÓN DE (1808-1842), Spanish poet, son of an officer in the Bourbon regiment, was born at or near Almendralejo de los Barros on the 25th of March 1808. On the close of the war he was sent to the preparatory school of artillery at Segovia, and later became a pupil of the poet Lista, then professor of literature at St Matthew's College in Madrid. In his fourteenth year he had attracted his master's attention by his verses, and had joined a secret society. Sentenced to five years' seclusion in the Franciscan convent at Guadalajara, he began an epic poem entitled *Pelayo*, of which fragments survive. He escaped to Portugal and thence to England, where he found the famous Teresa whom he had met at Lisbon; here, too, he became a student of Shakespeare, Milton and Byron. In 1830 he eloped with Teresa to Paris, took part in the July revolution, and soon after joined the raid of Chapalangarra on Navarre. In 1833 he returned to Spain and obtained a commission in the queen's guards. This, however, he soon forfeited by a political song, and he was banished to Cuéllar, where he wrote a poor novel entitled *Sancho Saldaña ó el Castellano de Cuéllar* (1834). He took an active part in the revolutionary risings of 1835 and 1836, and, on the accession to power of the Liberal party in 1840, was appointed secretary of legation at the Hague; in 1842 he was elected deputy for Almería, and seemed likely to play a great part in parliamentary life. But his constitution was undermined, and, after a short illness, he died at Madrid on the 23rd of May 1842. His poems, first published in 1840, at once gained for him a reputation which still continues undiminished. The influence of Byron pervades Espronceda's life and work. It is present in an ambitious variant on the Don Juan legend, *El Estudiante de Salamanca*, Elvira's letter being obviously modelled on Julia's letter in *Don Juan*; the *Canción del Pirata* is suggested by *The Corsair*; and the Byronic inspiration is not wanting even in the noble fragment entitled *El Diablo Mundo*, based on the story of Faust. But in *El Mendigo*, in *El Reo de Muerte*, in *El Verdugo*, and in the sombre vehement lines, *A Jarifa en una orgía*, Espronceda approves himself the most potent and original lyrical poet produced by Spain during the 19th century.

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ESQUIRE (O. Fr. *escuyer*, Mod. Fr. *écuyer*, derived through the form *escudier* from Med. Lat. *scutarius*, "shield-bearer"), originally the attendant on a knight, whose helm, shield and lance he carried at the tournament or in the field of battle. The esquire ranked immediately below the knight

bachelor, and his office was regarded as the apprentice stage of knighthood. The title was regarded as one of function, not of birth, and was not hereditary. In time, however, its original significance was lost sight of, and it came to be a title of honour, implying a rank between that of knight and valet or gentleman, as it technically still remains. Thus in the later middle ages esquire (*armiger*) was the customary description of holders of knight's fees who had not taken up their knighthood, whence the surviving custom of entitling the principal landowner in a parish "the squire" (see SQUIRE). Camden, at the close of the 16th century, distinguished four classes entitled to bear the style: (1) The eldest sons of knights, and their eldest sons, in perpetual succession; (2) the eldest sons of the younger sons of peers, and their eldest sons, in like perpetual succession; (3) esquires created by royal letters patent or other investiture, and their eldest sons; (4) esquires by office, *e.g.* justices of the peace and others who bear any office of trust under the crown. To these the writer in the 3rd edition of the *Encyclopaedia Britannica* (1797) added Irish peers and the eldest sons of British peers, who, though they bear courtesy titles, have in law only the right to be styled esquires. Officers of the king's courts, and of the royal household, counsellors at law and justices of the peace he described as esquires only "by reputation"; and justices of the peace have the title only as long as they are in commission; while certain heads of great landed families are styled "esquires" by prescription. "But the meaner ranks of people," he adds indignantly, "who know no better, do often basely prostitute this title; and, to the great confusion of all rank and precedence, every man who makes a decent appearance, far from thinking himself in any way ridiculed by finding the superscription of his letters thus decorated, is fully gratified by such an address."

It is clear, however, that the title of esquire was very loosely used at a much earlier date. On this point Selden is somewhat scornfully explicit. "To whomsoever, either by blood, place in the State or other eminency, we conceive some higher attribute should be given, than that sole Title of Gentleman, knowing yet that he hath no other honorary title legally fixed upon him, we usually style him an *Esquire*, in such passages as require legally that his degree or state be mentioned; as especially in Indictments and Actions whereupon he may be outlawed. Those of other nations who are Barons or great Lords in their own Countries, and no knights, are in legal proceedings stiled with us, Esquires only. Some of our greatest Heralds have their divisions of Esquires applied to this day. I leave them as I see them, where they may easily be found." Coke, too, says that every one is entitled to be termed esquire who has the legal right to call himself a gentleman (2. *Institutes*, 688).

At the present time the following classes are recognized as esquires on occasions of ceremony or for legal purposes:—(1) All sons of peers and lords of parliament during their fathers' lives, and the younger sons of such peers, &c., after their fathers' deaths; the eldest sons of peers' younger sons, and their eldest sons for ever. (2) Noblemen of all other nations. (3) The eldest sons of baronets and knights. (4) Persons bearing arms and the title of esquire by letters patent. (5) Esquires of the Bath and their eldest sons. (6) Barristers-at-law. (7) Justices of the peace and mayors while in commission or office. (8) The holders of any superior office under the crown. (9) Persons styled esquires by the sovereign in their patents, commissions or appointments.[1] (10) Attorneys in colonies where the functions of counsel and attorney are united (in England solicitors are "gentlemen," not "esquires").

In practice, however, the title of esquire, now to all intents and purposes meaningless, is given to any one who "can bear the port, charge and countenance of a gentleman." The word has followed the same course as that of "gentleman" (*q.v.*), and for very similar reasons. It is still not customary in Great Britain to address *e.g.* a well-to-do person engaged in trade as esquire at his shop; it would be offensive not to do so at his private residence. In America, on the other hand, the use of the word "esquire" is practically obsolete, "Mr" ("Mister" or "Master," at one time the title special to a "gentleman") being the general form of address.

See Selden, *Titles of Honor* (1672); Camden, *Britannia* (ed. London, 1594); Coke, *Institutes*; *Enc. of the Laws of England*, s. "Esquire"; Du Cange, *Glossarium* (ed. 1886), s. "Scutarius," "Scutifer" and "Armiger"; *New English Dictionary*, s. "Esquire."

(W. A. P.)

1 In practice this means every one receiving such a patent, commission or appointment.

ESQUIROL, JEAN ÉTIENNE DOMINIQUE (1772-1840), French alienist, was born at Toulouse on the 3rd of February 1772. In 1794 he became a pupil of the military hospital of Narbonne, and subsequently studied in Paris at the Salpêtrière under P. Pinel, whose assistant he became. In 1811 he was chosen physician to the Salpêtrière, and in 1817 he began a course of lectures on the treatment of the insane, in which he made such revelations of the abuses existing in the lunatic asylums of France that the government appointed a commission to inquire into the subject. Esquirol in this and other ways greatly assisted Pinel's efforts for the introduction of humaner methods. The asylums of Rouen, Nantes and Montpellier were built in accordance with his plans. In 1823 he became inspector-general of the university of Paris for the faculties of medicine, and in 1826 chief physician of the asylum at Charenton. He died at Paris on the 13th of December 1840. Besides contributing to the *Dictionnaire des sciences médicales* and the *Encyclopédie des gens du monde*,

Esquirol wrote *Des maladies mentales, considérées sous les rapports médical, hygiénique, et médico-légal* (2 vols., Paris, 1838).

ESQUIROS, HENRI FRANÇOIS ALPHONSE (1812-1876), French writer, was born in Paris on the 23rd of May 1812. After some minor publications he produced *L'Évangile du peuple* (1840), an exposition of the life and character of Jesus as a social reformer. This work was considered an offence against religion and decency, and Esquiros was fined and imprisoned. He was elected in 1850 as a social democrat to the Legislative Assembly, but was exiled in 1851 for his opposition to the Empire. Returning to France in 1869 he was again a member of the Legislative Assembly, and in 1876 was elected to the senate. He died at Versailles on the 12th of May 1876. He turned to account his residence in England in *L'Angleterre et la vie anglaise* (5 vols., 1859-1869). Among his numerous works on social subjects may be noted:—*Histoire des Montagnards* (2 vols., 1847); *Paris, ou les sciences, les institutions et les mœurs au XIX^e^ siècle* (2 vols., 1847); and *Histoire des martyrs de la liberté* (1851).

ESS, JOHANN HEINRICH VAN (1772-1847), German Catholic theologian, was born at Warburg, Westphalia, on the 15th of February 1772. He was educated at the Dominican gymnasium of his native town, and in 1790 entered, as a novice, the Benedictine abbey of Marienmünster, in the bishopric of Paderborn. His Benedictine name was Leander. He was priest at Schwalenberg from 1799 to 1812, after which he became extraordinary professor of theology and joint-director of the teachers' seminary at Marburg. In 1818 he received the doctorate of theology and of canonical law. In 1807, in conjunction with his cousin Karl van Ess, he had published a German translation of the New Testament, and, as its circulation was discountenanced by his superiors, he published in 1808 a defence of his views, entitled *Auszüge aus den heiligen Vätern und anderen Lehrern der katholischen Kirche über das nothwendige und nützliche Bibellesen*. An improved edition of this tractate was published in 1816, under the title *Gedanken über Bibel und Bibellehre*, and in the same year appeared *Was war die Bibel den ersten Christen?* In 1822 he published the first part of a German translation of the Old Testament, which was completed in 1836. In 1822 he resigned his offices at Marburg in order to devote his whole time to the defence of his views regarding Bible reading by the people, and to endeavour to promote the circulation of the scriptures. He was associated first with the Catholic Bible Society of Regensburg, and then with the British and Foreign Bible Society. He died at Affolderbach in the Odenwald on the 13th of October 1847.

ESSAY, ESSAYIST (Fr. *essai*, Late Lat. *exagium*, a weighing or balance; *exigere*, to examine; the term in general meaning any trial or effort). As a form of literature, the essay is a composition of moderate length, usually in prose, which deals in an easy, cursory way with the external conditions of a subject, and, in strictness, with that subject, only as it affects the writer. Dr Johnson, himself an eminent essayist, defines an essay as "an irregular, undigested piece"; the irregularity may perhaps be admitted, but want of thought, that is to say lack of proper mental digestion, is certainly not characteristic of a fine example. It should, on the contrary, always be the brief and light result of experience and profound meditation, while "undigested" is the last epithet to be applied to the essays of Montaigne, Addison or Lamb. Bacon said that the Epistles of Seneca were "essays," but this can hardly be allowed. Bacon himself goes on to admit that "the word is late, though the thing is ancient." The word, in fact, was invented for this species of writing by Montaigne, who merely meant that these were experiments in a new kind of literature. This original meaning, namely that these pieces were attempts or endeavours, feeling their way towards the expression of what would need a far wider space to exhaust, was lost in England in the course of the eighteenth century. This is seen by the various attempts made in the nineteenth century to coin a word which should express a still smaller work, as distinctive in comparison with the essay as the essay is by the side of the monograph; none of these linguistic experiments, such as *essayette*, *essaykin* (Thackeray) and *essaylet* (Helps) have taken hold of the language. As a matter of fact, the journalistic word *article* covers the lesser form of essay, although not exhaustively, since the essays in the monthly and quarterly reviews, which are fully as extended as an essay should ever be, are frequently termed "articles," while many "articles" in newspapers, dictionaries and encyclopaedias are in no sense essays. It may be said that the idea of a detached work is combined with the word "essay," which

should be neither a section of a disquisition nor a chapter in a book which aims at the systematic development of a story. Locke's *Essay on the Human Understanding* is not an essay at all, or cluster of essays, in this technical sense, but refers to the experimental and tentative nature of the inquiry which the philosopher was undertaking. Of the curious use of the word so repeatedly made by Pope mention will be made below.

The essay, as a species of literature, was invented by Montaigne, who had probably little suspicion of the far-reaching importance of what he had created. In his dejected moments, he turned to rail at what he had written, and to call his essays "inepties" and "sottises." But in his own heart he must have been well satisfied with the new and beautiful form which he had added to literary tradition. He was perfectly aware that he had devised a new thing; that he had invented a way of communicating himself to the world as a type of human nature. He designed it to carry out his peculiar object, which was to produce an accurate portrait of his own soul, not as it was yesterday or will be to-morrow, but as it is to-day. It is not often that we can date with any approach to accuracy the arrival of a new class of literature into the world, but it was in the month of March 1571 that the essay was invented. It was started in the second story of the old tower of the castle of Montaigne, in a study to which the philosopher withdrew for that purpose, surrounded by his books, close to his chapel, sheltered from the excesses of a fatiguing world. He wrote slowly, not systematically; it took nine years to finish the two first books of the essays. In 1574 the manuscript of the work, so far as it was then completed, was nearly lost, for it was confiscated by the pontifical police in Rome, where Montaigne was residing, and was not returned to the author for four months. The earliest imprint saw the light in 1580, at Bordeaux, and the Paris edition of 1588, which is the fifth, contains the final text of the great author. These dates are not negligible in the briefest history of the essay, for they are those of its revelation to the world of readers. It was in the delightful chapters of his new, strange book that Montaigne introduced the fashion of writing briefly, irregularly, with constant digressions and interruptions, about the world as it appears to the individual who writes. The *Essais* were instantly welcomed, and few writers of the Renaissance had so instant and so vast a popularity as Montaigne. But while the philosophy, and above all the graceful stoicism, of the great master were admired and copied in France, the exact shape in which he had put down his thoughts, in the exquisite negligence of a series of essays, was too delicate to tempt an imitator. It is to be noted that neither Charron, nor Mlle de Gournay, his most immediate disciples, tried to write essays. But Montaigne, who liked to fancy that the Eyquem family was of English extraction, had spoken affably of the English people as his "cousins," and it has always been admitted that his genius has an affinity with the English. He was early read in England, and certainly by Bacon, whose is the second great name connected with this form of literature. It was in 1597, only five years after the death of Montaigne, that Bacon published in a small octavo the first ten of his essays. These he increased to 38 in 1612 and to 58 in 1625. In their first form, the essays of Bacon had nothing of the fulness or grace of Montaigne's; they are meagre notes, scarcely more than the headings for discourses. It is possible that when he wrote them he was not yet familiar with the style of his predecessor, which was first made popular in England, in 1603, when Florio published that translation of the *Essais* which Shakespeare unquestionably read. In the later editions Bacon greatly expanded his theme, but he never reached, or but seldom, the freedom and ease, the seeming formlessness held in by an invisible chain, which are the glory of Montaigne, and distinguish the typical essayist. It would seem that at first, in England, as in France, no lesser writer was willing to adopt a title which belonged to so great a presence as that of Bacon or Montaigne. The one exception was Sir William Cornwallis (*d.* 1631), who published essays in 1600 and 1617, of slight merit, but popular in their day. No other English essayist of any importance appeared until the Restoration, when Abraham Cowley wrote eleven "Several Discourses by way of Essays," which did not see the light until 1668. He interspersed with his prose, translations and original pieces in verse, but in other respects Cowley keeps much nearer than Bacon to the form of Montaigne. Cowley's essay "Of Myself" is a model of what these little compositions should be. The name of Bacon inspires awe, but it is really not he, but Cowley, who is the father of the English essay; and it is remarkable that he has had no warmer panegyrists than his great successors, Charles Lamb and Macaulay. Towards the end of the century, Sir George Mackenzie (1636-1691) wrote witty moral discourses, which were, however, essays rather in name than form. Whenever, however, we reach the eighteenth century, we find the essay suddenly became a dominant force in English literature. It made its appearance almost as a new thing, and in combination with the earliest developments of journalism. On the 12th of April 1709 appeared the first number of a penny newspaper, entitled the *Tatler*, a main feature of which was to amuse and instruct fashionable readers by a series of short papers dealing with the manifold occurrences of life, *quicquid agunt homines*. But it was not until Steele, the founder of the *Tatler*, was joined by Addison that the eighteenth-century essay really started upon its course. It displayed at first, and indeed it long retained, a mixture of the manner of Montaigne with that of La Bruyère, combining the form of the pure essay with that of the character-study, as modelled on Theophrastus, which had been so popular in England throughout the seventeenth century. Addison's early *Tatler* portraits, in particular such as those of "Tom Folio" and "Ned Softly," are hardly essays. But Steele's "Recollections of Childhood" is, and here we may observe the type on which Goldsmith, Lamb and R.L. Stevenson afterwards worked. In January 1711 the *Tatler* came to an end, and was almost immediately followed by the *Spectator*, and in 1713 by the *Guardian*. These three newspapers are storehouses of admirable and typical essays, the majority of them written by Steele and Addison, who are the most celebrated eighteenth-century essayists in England. Later in the century, after the publication of other less successful experiments, appeared Fielding's essays in the *Covent Garden Journal* (1752) and Johnson's in the

Rambler (1750), the *Adventurer* (1752) and the *Idler* (1759). There followed a great number of polite journals, in which the essay was treated as "the bow of Ulysses in which it was the fashion for men of rank and genius to try their strength." Goldsmith reached a higher level than the Chesterfields and Bonnel Thorntons had dreamed of, in the delicious sections of his *Citizen of the World* (1760). After Goldsmith, the eighteenth-century essay declined into tamer hands, and passed into final feebleness with the pedantic Richard Cumberland and the sentimental Henry Mackenzie. The *corpus* of eighteenth-century essayists is extremely voluminous, and their reprinted works fill some fifty volumes. There is, however, a great sameness about all but the very best of them, and in no case do they surpass Addison in freshness, or have they ventured to modify the form he adopted for his lucubrations. What has survived of them all is the lightest portion, but it should not be forgotten that a very large section of the essays of that age were deliberately didactic and "moral." A great revival of the essay took place during the first quarter of the nineteenth century, and foremost in the history of this movement must always be placed the name of Charles Lamb. He perceived that the real business of the essay, as Montaigne had conceived it, was to be largely personal. The famous *Essays of Elia* began to appear in the *London Magazine* for August 1820, and proceeded at fairly regular intervals until December 1822; early in 1823 the first series of them were collected in a volume. The peculiarity of Lamb's style as an essayist was that he threw off the Addisonian and still more the Johnsonian tradition, which had become a burden that crushed the life out of each conventional essay, and that he boldly went back to the rich verbiage and brilliant imagery of the seventeenth century for his inspiration. It is true that Lamb had great ductility of style, and that, when he pleases, he can write so like Steele that Steele himself might scarcely know the difference, yet in his freer flights we are conscious of more exalted masters, of Milton, Thomas Browne and Jeremy Taylor. He succeeded, moreover, in reaching a poignant note of personal feeling, such as none of his predecessors had ever aimed at; the essays called "Dream Children" and "Blakesmoor" are examples of this, and they display a degree of harmony and perfection in the writing of the pure essay such as had never been attempted before, and has never since been reached. Leigh Hunt, clearing away all the didactic and pompous elements which had overgrown the essay, restored it to its old *Spectator* grace, and was the most easy nondescript writer of his generation in periodicals such as the *Indicator* (1819) and the *Companion* (1828). The sermons, letters and pamphlets of Sydney Smith were really essays of an extended order. In Hazlitt and Francis Jeffrey we see the form and method of the essay beginning to be applied to literary criticism. The writings of De Quincey are almost exclusively essays, although many of the most notable of them, under his vehement pen, have far outgrown the limits of the length laid down by the most indulgent formalist. His biographical and critical essays are interesting, but they are far from being trustworthy models in form or substance. In a sketch, however rapid, of the essay in the nineteenth century, prominence must be given to the name of Macaulay. His earliest essay, that on Milton, appeared in the *Edinburgh Review* in 1825, very shortly after the revelation of Lamb's genius in "Elia." No two products cast in the same mould could, however, be more unlike in substance. In the hands of Macaulay the essay ceases to be a confession or an autobiography; it is strictly impersonal, it is literary, historical or controversial, vigorous, trenchant and full of party prejudice. The periodical publication of Macaulay's Essays in the *Edinburgh Review* went on until 1844; when we cast our eyes over this mass of brilliant writing we observe with surprise that it is almost wholly contentious. Nothing can be more remarkable than the difference in this respect between Lamb and Macaulay, the former for ever demanding, even cajoling, the sympathy of the reader, the latter scanning the horizon for an enemy to controvert. In later times the essay in England has been cultivated in each of these ways, by a thousand journalists and authors. The "leaders" of a daily newspaper are examples of the popularization of the essay, and they point to the danger which now attacks it, that of producing a purely ephemeral or even momentary species of effect. The essay, in its best days, was intended to be as lasting as a poem or a historical monograph; it aimed at being one of the most durable and precious departments of literature. We still occasionally see the production of essays which have this more ambitious aim; within the last quarter of the nineteenth century the essays of R.L. Stevenson achieved it. His *Familiar Studies* are of the same class as those of Montaigne and Lamb, and he approached far more closely than any other contemporary to their high level of excellence. We have seen that the tone of the essay should be personal and confidential; in Stevenson's case it was characteristically so. But the voices which please the public in a strain of pure self-study are few at all times, and with the cultivation of the analytic habit they tend to become less original and attractive. It is possible that the essay may die of exhaustion of interest, or may survive only in the modified form of accidental journalism.

The essay, although invented by a great French writer, was very late in making itself at home in France. The so-called *Essais* of Leibnitz, Nicole, Yves Marie André and so many others were really treatises. Voltaire's famous *Essai sur les mœurs des nations* is an elaborate historical disquisition in nearly two hundred chapters. Later, the voluminous essays of Joseph de Maistre and of Lamennais were not essays at all in the literary sense. On the other hand, the admirable *Causeries du lundi* of Sainte-Beuve (1804-1869) are literary essays in the fulness of the term, and have been the forerunners of a great army of brilliant essay-writing in France. Among those who have specially distinguished themselves as French essayists may be mentioned Théophile Gautier, Paul de Saint-Victor, Anatole France, Jules Lemaître, Ferdinand Brunetière and Émile Faguet. All these are literary critics, and it is in the form of the analysis of manifestations of intellectual energy that the essay has been most successfully illustrated in France. All the countries of Europe, since the middle of the 19th century, have adopted this form of writing; such monographs or reviews, however, are not perfectly identical with the essay as it was conceived by Addison and Lamb. This last, it may be supposed, is a

definitely English thing, and this view is confirmed by the fact that in several European languages the word “essayist” has been adopted without modification.

In the above remarks it has been taken for granted that the essay is always in prose. Pope, however, conceived an essay in heroic verse. Of this his *Essay on Criticism* (1711) and his *Essay on Man* (1732-1734) are not good examples, for they are really treatises. The so-called *Moral Essays* (1720-1735), on the contrary, might have been contributed, if in prose, either to the *Spectator* or the *Guardian*. The idea of pure essays, in verse, however, did not take any root in English literature.

(E. G.)

ESSEG, Essegg or Essek (Hung. *Esszék*; Croatian *Osjek*), a royal free town, municipality, and capital of the county of Virovitica (*Veröcze*), in Croatia-Slavonia, on the right bank of the Drave, 9 m. W. of its confluence with the Danube, and 185 m. S. of Buda-Pest by rail. Pop. (1900) 24,930; chiefly Magyars and Croats, with a few Germans and Jews. At Esseg the Drave is crossed by two bridges, and below these it is navigable by small steamers. The upper town, with the fortress, is under military authority; the new town and the lower town, which is the headquarters of commerce, are under civil authority. The only buildings of note are the Roman Catholic and Orthodox churches, Franciscan and Capuchin monasteries, synagogue, gymnasium, modern school, hospital, chamber of commerce, and law-courts. Esseg has a thriving trade in grain, fruit, live-stock, plum-brandy and timber. Tanning, silk-weaving and glass-blowing are also carried on.

Esseg owes its origin to its fortress, which existed as early as the time of the Romans under the name of *Mursia*; though the present structure dates only from 1720. At the beginning of the Hungarian revolution of 1848 the town was held by the Hungarians, but on the 4th of February 1849 it was taken by the Austrians under General Baron Trebersberg.

ESSEN, a manufacturing town of Germany, in the Prussian Rhine province, 22 m. N.E. from Düsseldorf, on the main line of railway to Berlin, in an undulating and densely populated district. Pop. (1849) 8813; (1875) 54,790; (1905) 229,270. It lies at the centre of a network of railways giving it access to all the principal towns of the Westphalian iron and coal fields. Its general aspect is gloomy; it possesses few streets of any pretensions, though those in the old part, which are mostly narrow, present, with their grey slate roofs and green shutters, a picturesque appearance. Of its religious edifices (twelve Roman Catholic, one Old Catholic, six Protestant churches, and a synagogue) the minster, dating from the 10th century, with fine pictures, relics and wall frescoes, is alone especially remarkable. **This building** is very similar to the Pfalz-Kapelle (*capella in palatio*) at Aix-la-Chapelle. 779
Among the town’s principal secular buildings are the new Gothic town-hall, the post office and the railway station. There are several high-grade (classical and modern) schools, technical, mining and commercial schools, a theatre, a permanent art exhibition, and hospitals. Essen also has a beautiful public park in the immediate vicinity. The town originally owed its prosperity to the large iron and coal fields underlying the basin in which it is situated. Chief among its industrial establishments are the famous iron and steel works of Krupp (*q.v.*), and the whole of Essen may be said to depend for its livelihood upon this firm, which annually expends vast sums in building and supporting churches, schools, clubs, hospitals and philanthropic institutions, and in other ways providing for the welfare of its employees. There are also manufactories of woollen goods and cigars, dyeworks and breweries.

Essen was originally the seat of a Benedictine nunnery, and was formed into a town about the middle of the 10th century by the abbess Hedwig. The abbess of the nunnery, who held from 1275 the rank of a princess of the Empire, was assisted by a chapter of ten princesses and countesses; she governed the town until 1803, when it was secularized and incorporated with Prussia. In 1807 it came into the possession of the grand dukes of Berg, but was transferred to Prussia in 1814.

See Funcke, *Geschichte des Fürstenthums und der Stadt Essen* (Elberfeld, 1851); Kellen, *Die Industriestadt Essen in Wort und Bild* (Essen, 1902); and A. Shadwell, *Industrial Efficiency* (London, 1906).

ESSENES, a monastic order among the Jews prior to Christianity. Their first appearance in history is in the time of Jonathan the Maccabee (161-144 B.C.). How much older they may have been we have no means of determining, but our authorities agree in assigning to them a dateless antiquity. The

name occurs in Greek, in the two forms Ἐσσηνοί and Ἐσσαῖοι. Ἐσσηνοί is used by Josephus fourteen times, Ἐσσαῖοι six, but the latter is the only form used by Philo (ii. 457, 471, 632). Ἐσσηνοί is also used by Synesius and Hippolytus, and its Latin equivalent by Pliny and Solinus; Ἐσσαῖοι by Hegesippus and Porphyry. In Epiphanius we find the forms Ὀσσαῖοι, Ὀσσηνοί, and Ἰεσσαῖοι. There is a place named Essa mentioned by Josephus (Ant. xiii. 15, § 3), from which the name may have been formed, just as the Christians were originally called Ναζαρηνοί or Ναζωραῖοι, from Nazara. This etymology, however, is not much in favour now. Lightfoot explains the name as meaning "the silent ones," others as meaning "physicians." Perhaps there is most authority in favour of deriving it from the Syriac חסיך, which in the emphatic state becomes חסיא, so that we have a Semitic correspondence to both the Greek forms Ἐσσηνοί and Ἐσσαῖοι. This etymology makes the word mean "pious." It has also been urged in excuse for Philo's absurd derivation from ὅσιος.

The original accounts we have of them are confined to three authors—Philo, Pliny the Elder, and Josephus. Philo describes them in his treatise known as *Quod omnis probus liber* (§§ 12, 13; ii. 457-460), and also in his "Apology for the Jews," a fragment of which has been preserved by Eusebius (*Praep. Ev.* viii. 11, 12). Pliny (*N.H.* v. 17) has a short but striking sketch of them, derived in all probability from Alexander Polyhistor, who is mentioned among the authorities for the fifth book of his *Natural History*. This historian, of whom Eusebius had a very high opinion (*Praep. Ev.* ix. 17, § 1), lived in the time of Sulla. Josephus treats of them at length in his *Jewish War* (ii. 8), and more briefly in two passages of his *Antiquities* (xiii. 5, § 9; xviii. 1, § 5). He has also interesting accounts of the prophetic powers possessed by three individual members of the sect—Judas (*B.J.* i. 3, § 5; *Ant.* xiii. 11, § 2), Menahem (*Ant.* xv. 10, § 5), and Simon (*B.J.* ii. 7, § 3; *Ant.* xvii. 13, § 3). Besides this he mentions an Essene Gate in Jerusalem (*B.J.* v. 4, § 2) and a person called John the Essene, one of the bravest and most capable leaders in the war against the Romans (*B.J.* ii. 20, § 4; iii. 2, § 1). Josephus himself made trial of the sect of Essenes in his youth; but from his own statement it appears that he must have been a very short time with them, and therefore could not have been initiated into the inner mysteries of the society (*De vita sua*, 2). After this the notices that we have of the Essenes from antiquity are mere reproductions, except in the case of Epiphanius (died A.D. 402), who, however, is so confused a writer as to be of little value. Solinus, who was known as "Pliny's Ape," echoed the words of his master about a century after that writer's death, which took place in A.D. 79. Similarly Hippolytus, who lived in the reign of Commodus (A.D. 180-192), reproduced the account of Josephus, adding a few touches of his own. Porphyry (A.D. 233-306) afterwards did the same, but had the grace to mention Josephus in the context. Eusebius quoted the account as from Porphyry, though he must have known that *he* had derived it from Josephus (*Praep. Ev.* ix. 3, §§ 1, 13). But Porphyry's name would impress pagan readers. There is also a mention of the Essenes by Hegesippus (Eus. *H.E.* iv. 22) and by Synesius in his life of Dio Chrysostom. It has been conjectured that the Clementine literature emanated from Essenes who had turned Christian. (See EBIONITES.)

The Essenes were an exclusive society, distinguished from the rest of the Jewish nation in Palestine by an organization peculiar to themselves, and by a theory of life in which a severe asceticism and a rare benevolence to one another and to mankind in general were the most striking characteristics. They had fixed rules for initiation, a succession of strictly separate grades within the limits of the society, and regulations for the conduct of their daily life even in its minutest details. Their membership could be recruited only from the outside world, as marriage and all intercourse with women were absolutely renounced. They were the first society in the world to condemn slavery both in theory and practice; they enforced and practised the most complete community of goods. They chose their own priests and public office-bearers, and even their own judges. Though their prevailing tendency was practical, and the tenets of the society were kept a profound secret, it is perfectly clear from the concurrent testimony of Philo and Josephus that they cultivated a kind of speculation, which not only accounts for their spiritual asceticism, but indicates a great deviation from the normal development of Judaism, and a profound sympathy with Greek philosophy, and probably also with Oriental ideas. At the same time we do our Jewish authorities no injustice in imputing to them the patriotic tendency to idealize the society, and thus offer to their readers something in Jewish life that would bear comparison at least with similar manifestations of Gentile life.

There is some difficulty in determining how far the Essenes separated themselves locally from their fellow-countrymen. Josephus informs us that they had no single city of their own, but that many of them dwelt in every city. While in his treatise *Quod omnis*, &c., Philo speaks of their avoiding towns and preferring to live in villages, in his "Apology for the Jews" we find them living in many cities, villages, and in great and prosperous towns. In Pliny they are a perennial colony settled on the western shore of the Dead Sea. On the whole, as Philo and Josephus agree in estimating their number at 4000 (Philo, *Q.O.P.L.* § 12; Jos. *Ant.* xviii. 1, § 5), we are justified in suspecting some exaggeration as to the many cities, towns and villages where they were said to be found. As agriculture was their favourite occupation, and as their tendency was to withdraw from the haunts and ordinary interests of mankind, we may assume that with the growing confusion and corruption of Jewish society they felt themselves attracted from the mass of the population to the sparsely peopled districts, till they found a congenial settlement and free scope for their peculiar view of life by the shore of the Dead Sea. While their principles were consistent with the neighbourhood of men, they were better adapted to a state of seclusion.

The Essenes did not renounce marriage because they denied the validity of the institution or the necessity of it as providing for the continuance of the human race, but because they had a low

opinion of the character of women (Jos. *B.J.* ii. 8, § 2; Philo, “Apol. for the Jews” in Eus. *Praep. Ev.* viii. 11, § 8). They adopted children when very young, and brought them up on their own principles. Pleasure generally they rejected as evil. They despised riches not less than pleasure; neither poverty nor wealth was observable among them; at initiation every one gave his property into the common stock; every member in receipt of wages handed them over to the funds of the society. In matters of dress the asceticism of the society was very pronounced. They regarded oil as a defilement, even washing it off if anointed with it against their will. They did not change their clothes or their shoes till they were torn in pieces or worn completely away. The colour of their garments was always white. Their daily routine was prescribed for them in the strictest manner. Before the rising of the sun they were to speak of nothing profane, but offered to it certain traditional forms of prayer as if beseeching it to rise. Thereafter they went about their daily tasks, working continuously at whatever trade they knew till the fifth hour, when they assembled, and, girding on a garment of linen, bathed in cold water. They next seated themselves quietly in the dining hall, where the baker set bread in order, and the cook brought each a single dish of one kind of food. Before meat and after it grace was said by a priest. After dinner they resumed work till sunset. In the evening they had supper, at which guests of the order joined them, if there happened to be any such present. Withal there was no noise or confusion to mar the tranquillity of their intercourse; no one usurped more than his share of the conversation; the stillness of the place oppressed a stranger with a feeling of mysterious awe. This composure of spirit was owing to their perfect temperance in eating and drinking. Not only in the daily routine of the society, but generally, the activity of the members was controlled by their presidents. In only two things could they take the initiative, helpfulness and mercy; the deserving poor and the destitute were to receive instant relief; but no member could give anything to his relatives without consulting the heads of the society. Their office-bearers were elected. They had also their special courts of justice, which were composed of not less than a hundred members, and their decisions, which were arrived at with extreme care, were irreversible. Oaths were strictly forbidden; their word was stronger than an oath. They were just and temperate in anger, the guardians of good faith, and the ministers of peace, obedient to their elders and to the majority. But the moral characteristics which they most earnestly cultivated and enjoined will best appear in their rules of initiation. There was a novitiate of three years, during which the intending member was tested as to his fitness for entering the society. If the result was satisfactory, he was admitted, but before partaking of the common meal he was required to swear awful oaths, that he would reverence the deity, do justice to men, hurt no man voluntarily or at the command of another, hate the unjust and assist the just, and that he would render fidelity to all men, but especially to the rulers, seeing that no one rules but of God. He also vowed, if he should bear rule himself, to make no violent use of his power, nor outshine those set under him by superior display, to make it his aim to cherish the truth and unmask liars, to be pure from theft and unjust gain, to conceal nothing from his fellow-members, nor to divulge any of their affairs to other men, even at the risk of death, to transmit their doctrines unchanged, and to keep secret the books of the society and the names of the angels.

Within the limits of the society there were four grades so distinct that if any one touched a member of an inferior grade he required to cleanse himself by bathing in water; members who had been found guilty of serious crimes were expelled from the society, and could not be received again till reduced to the very last extremity of want or sickness. As the result of the ascetic training of the Essenes, and of their temperate diet, it is said that they lived to a great age, and were superior to pain and fear. During the Roman war they cheerfully underwent the most grievous tortures rather than break any of the principles of their faith. In fact, they had in many respects reached the very highest moral elevation attained by the ancient world; they were just, humane, benevolent, and spiritually-minded; the sick and aged were the objects of a special affectionate regard; and they condemned slavery, not only as an injustice, but as an impious violation of the natural brotherhood of men (Philo ii. 457). There were some of the Essenes who permitted marriage, but strictly with a view to the preservation of the race; in other respects they agreed with the main body of the society.

It will be apparent that the predominant tendency of the society was practical. Philo tells us expressly that they rejected logic as unnecessary to the acquisition of virtue, and speculation on nature as too lofty for the human intellect. Yet they had views of their own as to God, Providence, the soul, and a future state, which, while they had a practical use, were yet essentially speculative. On the one hand, indeed, they held tenaciously by the traditional Judaism: blasphemy against their lawgiver was punished with death, the sacred books were preserved and read with great reverence, though not without an allegorical interpretation, and the Sabbath was most scrupulously observed. But in many important points their deviation from the strait path of Judaic development was complete. They rejected animal sacrifice as well as marriage; the oil with which priests and kings were anointed they accounted unclean; and the condemnation of oaths and the community of goods were unmistakable innovations for which they found no hint or warrant in the old Hebrew writings. Their most singular feature, perhaps, was their reverence for the sun. In their speculative hints respecting the soul and a future state, we find another important deviation from Judaism, and the explanation of their asceticism. They held that the body is mortal, and its substance transitory; that the soul is immortal, but, coming from the subtlest ether, is lured as by a sorcery of nature into the prison-house of the body. At death it is released from its bonds, as from long slavery, and joyously soars aloft. To the souls of the good there is reserved a life beyond the ocean, and a country oppressed by neither rain, nor snow, nor heat, but refreshed by a gentle west wind blowing continually from the sea (cf. Hom. *Od.* iv. 566-568), but to the wicked a region of wintry darkness and of unceasing torment. Josephus tells us too that the Essenes believed in fate; but in what sense, and

what relation it bore to Divine Providence, does not appear.

The above evidence has left students in doubt as to whether Essenism is to be regarded as a pure product of the Jewish mind or as due in part to some foreign influence. On the one hand it might be maintained that the Essenes out-Pharisee'd the Pharisees. They had in common with that sect their veneration for Moses and the Law, their Sabbatarianism, their striving after ceremonial purity, and their tendency towards fatalism. But if the Pharisees abstained from good works on the Sabbath, the Essenes abstained even from natural necessities (Jos. *B.J.* ii. 8, § 9); if the Pharisees washed, the Essenes bathed before dinner; if the Pharisees ascribed some things to Fate, the Essenes ascribed all (Jos. *Ant.* xiii. 5, § 9). But on the other hand the Essenes avoided marriage, which the Pharisees held in honour; they offered no animal-sacrifices in the Temple; they refrained from the use of oil, which was customary among the Pharisees (Luke vii. 46); above all, they offered prayers to the sun, after the manner denounced in Ezekiel (viii. 16). These and other points of divergences are not explained by Ritschl's interesting theory that Essenism was an organized attempt to carry out the idea of "a kingdom of priests and an holy nation" (Ex. xix. 6).

Granting then that some foreign influence was at work in Essenism, we have four theories offered to us—that this influence was Persian, Buddhist, Pythagorean, or lastly, as maintained by Lipsius, that of the surrounding Syrian heathenism. Each of these views has had able advocates, but it must not be supposed that they are mutually exclusive. If we consider how Philo, while remaining a devout Jew in religion, yet managed to assimilate the whole Stoic philosophy, we can well believe that the Essenes might have been influenced, as Zeller maintained that they were, by Neo-Pythagoreanism. But as Pythagoras himself came from Samos, and his doctrines have a decidedly Oriental tinge, it may very well be that both he and the Essenes drew from a common source; for there is no need to reject, as is so commonly done, the statements of our authorities as to the antiquity of the Essenes. 781
This common source we may believe with Lightfoot to have been the Persian religion, which we know to have profoundly influenced that of Israel, independently of the Essenes.

The fact that the Pharisees and Sadducees so often figure in the pages of the New Testament, while the Essenes are never mentioned, might plausibly be interpreted to show that the New Testament emanated from the side of the Essenes. So far as concerns the Epistle of St James this interpretation would probably be correct. That work contains the doctrine common to the Essenes with Plato, and suggestive of Persian Dualism, that God is the author of good only. There are also certain obvious points of resemblance between the Essenes and the early Christians. Both held property in common; both had scattered communities which received guests one from the other; both avoided a light use of oaths; both taught passive obedience to political authority. The list might be enlarged, but it would not necessarily prove more than that the early Christians shared in the ideas of their age. Christianity was to some extent a popularization of Essenism, but there is little reason for believing that Jesus himself was an Essene. De Quincey's contention that there were no Essenes but the early Christians is now a literary curiosity.

The original sources of our knowledge of the Essenes have been mentioned at the beginning of this paper; the best modern discussions of them are to be found in such works as Zeller's *Philosophie der Griechen*, vol. iii.; Ewald, *Geschichte d. V. Israël*, iii. 419-428; Reuss, *La Théologie chrétienne au siècle apostolique*, i. 122-131; Keim, *Life of Jesus of Nazara*, vol. i.; Lightfoot on the Colossians; Lucius, *Der Essenismus in seinem Verhältniss zum Judenthum*; Wellhausen, *Israelitische und jüdische Geschichte*; Ed. Schürer, *The Jewish People in the Time of Jesus Christ*, div. ii. vol. ii. § 30. The copious bibliography in Conybeare's edition of Philo's *De vita contemplativa* bears upon the Essenes as well as upon the Therapeutes. For a specially Jewish view of the Essenes see Kohler's article in the *Jewish Encyclopaedia*. They are there regarded as being "simply the rigorists among the Pharisees." But we are also told that "the Pharisees characterized the Essene as 'a fool who destroyed the world.'"

(T. K.; St G. S.)

ESSENTUKI, a watering-place of south Russia, in the government of Terek, 11 m. by rail W. from Pyatigorsk; altitude, 2096 ft. Its alkaline and sulphur-alkaline mineral waters, similar to those of Ems, Selters and Vichy, are much visited in summer. The climate shows great variations in temperature. Pop. (1897) 9974.

ESSEQUIBO, or Essequebo, one of the three settlements of British Guiana, taking its name from the river Essequibo. (See Guiana.)

ESSEX, EARLS OF. The first earl of Essex was probably Geoffrey de Mandeville (*q.v.*), who became earl about 1139, the earldom being subsequently held by his two sons, Geoffrey and William, until the death of the latter in 1189. In 1199 Geoffrey Fitzpeter or Fitzpiers (d. 1213), who was related to the Mandevilles through his wife Beatrice, became earl of Essex, and on the death of Geoffrey's son William in 1227 the earldom reverted for the second time to the crown. Then the title to the earldom passed by marriage to the Bohuns, earls of Hereford, and before 1239 Humphrey de Bohun (d. 1275) had been recognized as earl of Essex. With the earldom of Hereford the earldom of Essex became extinct in 1373; afterwards it was held by Thomas of Woodstock, duke of Gloucester, a son of Edward III. and the husband of Eleanor de Bohun; and from Gloucester it passed to the Bourchiers, Henry Bourchier (d. 1483), who secured the earldom in 1461, being one of Gloucester's grandsons. The second and last Bourchier earl was Henry's grandson Henry, who died early in 1540. A few weeks before his execution in 1540 Thomas Cromwell (*q.v.*) was created earl of Essex; then in 1543 William Parr, afterwards marquess of Northampton, obtained the earldom by right of his wife Anne, a daughter of the last Bourchier earl. Northampton lost the earldom when he was attainted in 1553; and afterwards it passed to the famous family of Devereux, Walter Devereux, who was created earl of Essex in 1572, being related to the Bourchiers. Robert, the 3rd and last Devereux earl, died in 1646. In 1661 Arthur Capel was created earl of Essex, and the earldom is still held by his descendants.

ESSEX, ARTHUR CAPEL, 1ST[1] EARL OF (1632-1683), English statesman, son of Arthur, 1st Baron Capel of Hadham (*c.* 1641), executed in 1649, and of Elizabeth, daughter and heir of Sir Charles Morrison of Cashiobury in Hertfordshire, was baptized on the 28th of January 1632. In June 1648, then a sickly boy of sixteen, he was taken by Fairfax's soldiers from Hadham to Colchester, which his father was defending, and carried every day round the works with the hope of inducing Lord Capel to surrender the place. At the restoration he was created Viscount Malden and earl of Essex (20th of April 1661), with special remainder to the male issue of his father, and was made lord-lieutenant of Hertfordshire and a few years later of Wiltshire.[2]

He early showed himself antagonistic to the court, to Roman Catholicism, and to the extension of the royal prerogative, and was coupled by Charles II. with Holles as "stiff and sullen men," who would not yield against their convictions to his solicitations. In 1669 he was sent as ambassador to King Christian V. of Denmark, in which capacity he gained credit by refusing to strike his flag to the governor of Kronborg. In 1672 he was made a privy councillor and lord-lieutenant of Ireland. He remained in office till 1677, and his administration was greatly commended by Burnet and Ormonde,[3] the former describing it "as a pattern to all that come after him." He identified himself with Irish interests, and took immense pains to understand the constitution and the political necessities of the country, appointing men of real merit to office, and maintaining an exceptional independence from solicitation and influence. He held a just balance between the Roman Catholics, the English Church and the Presbyterians, protecting the former as far as public opinion in England would permit, and governing the native Irish with firmness and moderation. The purity and patriotism of his administration were in strong contrast to the hopeless corruption prevalent in that at home and naturally aroused bitter opposition, as an obstacle to the unscrupulous employment of Irish revenues for the satisfaction of the court and the king's expenses. In particular he came into conflict with Lord Ranelagh, to whom had been assigned the Irish revenues on condition of his supplying the requirements of the crown, and whose accounts Essex refused to pass. He opposed strongly the lavish gifts of forfeited estates to court favourites and mistresses, prevented the grant of Phoenix Park to the duchess of Cleveland, and refused to encumber the administration by granting reversions. Finally the intrigues of his enemies at home, and Charles's continual demands for money, which Ranelagh undertook to satisfy, brought about his recall in April 1677. He immediately joined the country party and the opposition to Danby's government, and on the latter's fall in 1679 was appointed a commissioner of the treasury, and the same year a member of Sir William Temple's new-modelled council. He followed the lead of Halifax, who advocated not the exclusion of James, but the limitation of his sovereign powers, and looked to the prince of Orange rather than to Monmouth as the leader of Protestantism, incurring thereby the hostility of Shaftesbury, but at the same time gaining the confidence of Charles. He was appointed by Charles together with Halifax to hear the charges against Lauderdale. In July he wrote a wise and statesmanlike letter to the king, advising him to renounce his project of raising a new company of guards. Together with Halifax he urged Charles to summon the parliament, and after his refusal resigned the treasury in November, the real cause being, according to one account,[4] a demand upon the treasury by the duchess of Cleveland for £25,000, according to another "the niceness of touching French money," "that makes my Lord Essex's squeasy stomach that it can no longer digest his employment."[5]

Subsequently his political attitude underwent a change, the exact cause of which is not clear—probably a growing conviction of the dangers threatened by a Roman Catholic sovereign of the character of James. He now, in 1680, joined Shaftesbury's party and supported the Exclusion Bill, and on its rejection by the Lords carried a motion for an association to execute the scheme of expedients

promoted by Halifax. On the 25th of January 1681 at the head of fifteen peers he presented a petition to the king, couched in exaggerated language, requesting the abandonment of the session of parliament at Oxford. He was a jealous prosecutor of the Roman Catholics in the popish plot, and voted for Stafford's attainder, on the other hand interceding for Archbishop Plunket, implicated in the pretended Irish plot. He, however, refused to follow Shaftesbury in his extreme courses, declined participation in the latter's design to seize the Tower in 1682, and on Shaftesbury's consequent departure from England became the leader of Monmouth's faction, in which were now included Lord Russell, Algernon Sidney, and Lord Howard of Escrick. Essex took no part in the wilder schemes of the party, but after the discovery of the Rye House Plot in June 1683, and the capture of the leaders, he was arrested at Cashiobury and imprisoned in the Tower. His spirits and fortitude appear immediately to have abandoned him, and on the 13th of July he was discovered in his chamber with his throat cut. His death was attributed, quite groundlessly, to Charles and James, and the evidence points clearly if not conclusively to suicide, his motive being possibly to prevent an attainder and preserve his estate for his family. He was, however, undoubtedly a victim of the Stuart administration, and the antagonism and tragic end of men like Essex, deserving men, naturally devoted to the throne, constitutes a severe indictment of the Stuart rule.

He was a statesman of strong and sincere patriotism, just and unselfish, conscientious and laborious in the fulfilment of public duties, blameless in his official and private life. Evelyn describes him as "a sober, wise, judicious and pondering person, not illiterate beyond the rule of most noblemen in this age, very well versed in English history and affairs, industrious, frugal, methodical and every way accomplished"; and declares he was much deplored, few believing he had ever harboured any seditious designs.[6] He married Lady Elizabeth Percy, daughter of Algernon, 10th earl of Northumberland, by whom, besides a daughter, he had an only son Algernon (1670-1710), who succeeded him as 2nd earl of Essex.

Bibliography.—See the Lives in the *Dict. of Nat. Biography* and in *Biographia Britannica* (Kippis), with authorities there collected; Essex's Irish correspondence is in the *Stow Collection* in the British Museum, Nos. 200-217, and selections have been published in *Letters written by Arthur Capel, Earl of Essex* (1770) and in the *Essex Papers* (Camden Society, 1890), to which can now be added the *Calendars of State Papers, Domestic*, which contain a large number of his letters and which strongly support the opinion of his contemporaries concerning his unselfish patriotism and industry; see also *Somers Tracts* (1813), x., and for other pamphlets relating to his death the catalogue of the British Museum.

1 *i.e.* in the Capel line.

2 *Hist. MSS. Comm. ser.*; *Duke of Beaufort's MSS.* 45.

3 *Life of Ormonde*, by T. Carte, viii. 468 (1851), vol. iv. p. 529.

4 *Hist. MSS. Comm.* 7th Rep. app. 477b.

5 *Ib.* 6th Rep. app. 741b.

6 *Diary and Corresp.* (1850), ii. 141, 178.

ESSEX, ROBERT DEVEREUX, 2nd[1] Earl of (1566-1601), son of the 1st Devereux earl, was born at Netherwood, Herefordshire, on the 19th of November 1566. He entered the university of Cambridge and graduated in 1581. In 1585 he accompanied his stepfather, the earl of Leicester, on an expedition to Holland, and greatly distinguished himself at the battle of Zutphen. He now took his place at court, where so handsome a youth soon found favour with Queen Elizabeth, and in consequence was on bad terms with Raleigh. In 1587 he was appointed master of the horse, and in the following year was made general of the horse and installed knight of the Garter. On the death of Leicester he succeeded him as chief favourite of the queen, a position which injuriously affected his whole subsequent life, and ultimately resulted in his ruin. While Elizabeth was approaching the mature age of sixty, Essex was scarcely twenty-one. Though well aware of the advantages of his position, and somewhat vain of the queen's favour, his constant attendance on her at court was irksome to him beyond all endurance; and when he could not make his escape to the scenes of foreign adventure after which he longed, he varied the monotony of his life at court by intrigues with the maids of honour. He fought a duel with Sir Charles Blount, a rival favourite of the queen, in which the earl was disarmed and slightly wounded in the thigh.

In 1589, without the queen's consent, he joined the expedition of Drake and Sir John Norris against Spain, but in June he was compelled to obey a letter enjoining him at his "uttermost peril" to return immediately. In 1590 Essex married the widow of Sir Philip Sidney, but in dread of the queen's anger he kept the marriage secret as long as possible. When it was necessary to avow it, her rage at first knew no bounds, but as the earl did "use it with good temper," and "for her majesty's better satisfaction was pleased that my lady should live retired in her mother's house," he soon came to be "in very good favour." In 1591 he was appointed to the command of a force auxiliary to one formerly

sent to assist Henry IV. of France against the Spaniards; but after a fruitless campaign he was finally recalled from the command in January 1592. For some years after this most of his time was spent at court, where he held a position of unexampled influence, both on account of the favour of the queen and from his own personal popularity. In 1596 he was, after a great many “changes of humour” on the queen’s part, appointed along with Lord Howard of Effingham, Raleigh and Lord Thomas Howard, to the command of an expedition, which was successful in defeating the Spanish fleet, capturing and pillaging Cadiz, and destroying 53 merchant vessels. It would seem to have been shortly after this exploit that the beginnings of a change in the feelings of the queen towards him came into existence. On his return she chided him that he had not followed up his successes, and though she professed great pleasure at again seeing him in safety, and was ultimately satisfied that the abrupt termination of the expedition was contrary to his advice and remonstrances, she forbade him to publish anything in justification of his conduct. She doubtless was offended at his growing tendency to assert his independence, and jealous of his increasing popularity with the people; but it is also probable that her strange infatuation regarding her own charms, great as it was, scarcely prevented her from suspecting either that his professed attachment had all along been somewhat alloyed with considerations of personal interest, or that at least it was now beginning to cool. Francis Bacon, at that time his most intimate friend, endeavoured to prevent the threatened rupture by writing him a long letter of advice; and although perseverance in a long course of feigned action was for Essex impossible, he for some time attended pretty closely to the hints of his mentor, so that the queen “used him most graciously.” In 1597 he was appointed master of the ordnance, and in the following year he obtained command of an expedition against Spain, known as the Islands or Azores Voyage. He gained some trifling successes, but as the Plate fleet escaped him he failed of his main purpose; and when on his return the queen met him with the usual reproaches, he retired to his home at Wanstead. This was not what Elizabeth desired, and although she conferred on Lord Howard of Effingham the earldom of Nottingham for services at Cadiz, the main merit of which was justly claimed by Essex, she ultimately held out to the latter the olive branch of peace, and condescended to soothe his wounded honour by creating him earl marshal of England. That, nevertheless, the irritated feelings neither of Essex nor of the queen were completely healed was manifested shortly afterwards in a manner which set propriety completely at defiance. In a discussion on the appointment of a lord deputy to Ireland, Essex, on account of some taunting words of Elizabeth, turned his back upon her with a gesture indicative not only of anger but of contempt, and when she, unable to control her indignation, slapped him on the face, he left her presence swearing that such an insult he would not have endured even from Henry VIII.

In 1599, while Ulster was in rebellion under the earl of Tyrone, the office of lieutenant and governor-general of Ireland was conferred on Essex, and a large force put at his command. His 783
campaign was an unsuccessful one, and by acting in various ways in opposition to the commands of the queen and the council, agreeing with Tyrone on a truce in September, and suddenly leaving the post of duty with the object of privately vindicating himself before the queen, he laid himself open to charges more serious than that of mere incompetency. For these misdemeanours he was brought in June 1600 before a specially constituted court, deprived of all his high offices, and ordered to live a prisoner in his own house during the queen’s pleasure. Chiefly through the intercession of Bacon his liberty was shortly afterwards restored to him, but he was ordered not to return to court. For some time he hoped for an improvement in his prospects, but when he was refused the renewal of his patent for sweet wines, hope was succeeded by despair, and half maddened by wounded vanity, he made an attempt (Feb. 7, 1601) to incite a revolution in his behalf, by parading the streets of London with 300 retainers, and shouting, “For the queen! a plot is laid for my life!” These proceedings awakened, however, scarcely any other feelings than mild perplexity and wonder; and finding that hope of assistance from the citizens was vain, he returned to Essex House, where after defending himself for a short time he surrendered. After a trial—in which Bacon, who prosecuted, delivered a speech against his quondam friend and benefactor, the bitterness of which was quite unnecessary to secure a conviction entailing at least very severe punishment—he was condemned to death, and notwithstanding many alterations in Elizabeth’s mood, the sentence was carried out on the 25th of February 1601.

Essex was in person tall and well proportioned, with a countenance which, though not strictly handsome, possessed, on account of its bold, cheerful and amiable expression, a wonderful power of fascination. He was a patron of literature, and himself a poet. His carriage was not very graceful, but his manners are said to have been “courtly, grave and exceedingly comely.” He was brave, chivalrous, impulsive, imperious sometimes with his equals, but generous to all his dependants and incapable of secret malice; and these virtues, which were innate and which remained with him to the last, must be regarded as somewhat counterbalancing, in our estimation of him, the follies and vices created by temptations which were exceptionally strong.

See Hon. W.B. Devereux, *Lives of the Earls of Essex* (1853); and *Bacon and Essex*, by E.A. Abbott (1877). Also the article Bacon, Francis, and authorities there.

1 *i.e.* in the Devereux line.

ESSEX, ROBERT DEVEREUX, 3RD[1] EARL OF (1591-1646), son of the preceding, was born in 1591. He was educated at Eton and at Merton College, Oxford. Shortly after the arrival of James I. in London, Essex (whose title was restored, and the attainder on his father removed, in 1604) was placed about the prince of Wales, as a sharer both in his studies and amusements. At the early age of fifteen he was married to Frances Howard, daughter of the earl of Suffolk, but she was his wife only in name; during his absence abroad (1607-1609) she fell in love with Sir Robert Carr (afterwards earl of Somerset), and on her charging her husband with physical incapacity, the marriage was annulled in 1613. A second marriage which he contracted in 1631 with Elizabeth, daughter of Sir William Paulet, also ended unhappily. From 1620 to 1623 he served in the wars of the Palatinate, and in 1625 he was vice-admiral of a fleet which made an unsuccessful attempt to capture Cadiz. In 1639 he was lieutenant-general of the army sent by Charles against the Scottish Covenanters; but on account of the irresolution of the king no battle occurred, and the army was disbanded at the end of the year. Essex was discharged "without ordinary ceremony," and refused an office which at that time fell vacant, "all which," says Clarendon, "wrought very much upon his rough, proud nature, and made him susceptible of some impressions afterwards which otherwise would not have found such easy admission." Having taken the side of the parliament against Charles, he was, on the outbreak of the civil war in 1642, appointed to the command of the parliamentary army. At the battle of Edgehill he remained master of the field, and in 1643 he captured Reading, and relieved Gloucester; but in the campaign of the following year, on account of his hesitation to fight against the king in person, nearly his whole army fell into the hands of Charles. In 1645, on the passing of the self-denying ordinance, providing that no member of parliament should hold a public office, he resigned his commission; but on account of his past services his annuity of £10,000 was continued to him for life. He died on the 14th of September 1646, of a fever brought on by over-exertion in a stag-hunt in Windsor Forest; his line becoming extinct.

See the "Life of Robert Earl of Essex," by Robert Codrington, M.A., printed in *Hart. Misc.*; Clarendon's *History of the Rebellion*, and Hon. W.B. Devereux, *Lives of the Earls of Essex* (1853).

1 *i.e.* in the Devereux line.

ESSEX, WALTER DEVEREUX, 1ST[1] EARL OF (1541-1576), the eldest son of Sir Richard Devereux, was born in 1541. His grandfather was the 2nd Baron Ferrers, who was created Viscount Hereford in 1550 and by his mother was a nephew of Henry Bourchier, a former earl of Essex. Walter Devereux succeeded as 2nd Viscount Hereford in 1558, and in 1561 or 1562 married Lettice, daughter of Sir Francis Knollys. In 1569 he served as high marshal of the field under the earl of Warwick and Lord Clinton, and materially assisted them in suppressing the northern insurrection. For his zeal in the service of Queen Elizabeth on this and other occasions, he in 1572 received the Garter and was created earl of Essex, the title which formerly belonged to the Bourchier family. Eager to give proof of "his good devotion to employ himself in the service of her majesty," he offered on certain conditions to subdue and colonize, at his own expense, a portion of the Irish province of Ulster, at that time completely under the dominion of the rebel O'Neills, under Sir Brian MacPhelim and Tirlogh Luineach, with the Scots under their leader Sorley Boy MacDonnell. His offer, with certain modifications, was accepted, and he set sail for Ireland in July 1573, accompanied by a number of earls, knights and gentlemen, and with a force of about 1200 men. The beginning of his enterprise was inauspicious, for on account of a storm which dispersed his fleet and drove some of his vessels as far as Cork and the Isle of Man, his forces did not all reach the place of rendezvous till late in the autumn, and he was compelled to entrench himself at Belfast for the winter. Here, by sickness, famine and desertions, his troops were diminished to little more than 200 men. Intrigues of various sorts, and fighting of a guerilla type, followed with disappointing results, and Essex had difficulties both with the deputy Fitzwilliam and with the queen. Essex was in straits himself, and his offensive movements in Ulster took the form of raids and brutal massacres among the O'Neills; in October 1574 he treacherously captured MacPhelim at a conference in Belfast, and after slaughtering his attendants had him and his wife and brother executed at Dublin. Elizabeth, instigated apparently by Leicester, after encouraging Essex to prepare to attack the Irish chief Tirlogh Luineach, suddenly commanded him to "break off his enterprise"; but, as she left him a certain discretionary power, he took advantage of it to defeat Tirlogh Luineach, chastise Antrim, and massacre several hundreds of Sorley Boy's following, chiefly women and children, discovered hiding in the caves of Rathlin. He returned to England in the end of 1575, resolved "to live henceforth an untroubled life"; but he was ultimately persuaded to accept the offer of the queen to make him earl marshal of Ireland. He arrived in Dublin in September 1576, and three weeks afterwards died of dysentery. There were suspicions that he had been poisoned by Leicester, who shortly after his death married his widow, but these were not confirmed by the post-mortem examination. The endeavours of Essex to better the condition of Ireland were a dismal failure; and the massacres of the O'Neills and of the Scots of Rathlin leave a dark stain on his reputation.

See Sidney Lee's article in the *Dict. Nat. Biog.; Lives of the Devereux Earls of Essex*, by Hon. Walter

B. Devereux (1853); Froude's *History of England*, vol. x.; J.S. Brewer, *Athenaeum* (1870), part i. pp. 261, 326.

1 *i.e.* in the Devereux line.

ESSEX, an eastern county of England, bounded N. by Cambridgeshire and Suffolk, E. by the North Sea, S. by the Thames, dividing it from Kent, W. by the administrative county of London and by Hertfordshire. Its area is 1542 sq. m. Its configuration is sufficiently indicated by the direction of its rivers. Except that in the N.W. the county includes the heads of a few valleys draining northward to the Cam and so to the Great Ouse, all the streams, which are never of great size, run southward and eastward, either into the Thames, or into the North Sea by way of the broad, shallow estuaries which ramify through the flat coast lands. The highest ground lies consequently in the north-west, between the Cam basin and the rivers of the county. Its principal southward extension is that between the Lea (which with its tributary the Stort forms a great part of the western boundary) and the Roding, and east of the Roding valley. The other chief rivers may be specified according to their estuaries, following the coast northward from Shoeburyness at the Thames mouth. That of the Roach ramifies among several islands of which Foulness is the largest, but its main branch joins the Crouch estuary. Next follows the Blackwater, which receives the Chelmer, the Brain and other streams. Following a coast of numerous creeks and islets, with the large island of Mersea, the Colne estuary is reached. The Colne and Blackwater may be said to form one large estuary, as they enter the sea by a well-marked common mouth, 5 m. in width, between Sales Point and Colne Point. There is a great irregular inlet (Hamford Water) receiving no large stream, W. of the Naze promontory, and then the Stour, bounding the county on the north, joins its estuary to that of the Orwell near the sea. There are several seaside watering-places in favour owing to their proximity to London, of which Southend-on-Sea above the mouth of the Thames, Clacton-on-Sea, Walton-on-the-Naze, and Dovercourt adjoining Harwich are the chief. These and other stations on the estuaries are also in favour with yachtsmen. The sea has at some points seriously encroached upon the land within historic times. The low soft cliffs at various points are liable to give way against the waves; in other parts dykes and embankments are necessary to prevent inundation. Inland, that is apart from the flat coast-district, the country is pleasantly undulating and for the most part well wooded. It was formerly, indeed, almost wholly forested, the great Waltham Forest stretching from Colchester to the confines of London. Of this a fragment is preserved in Epping Forest (see Epping) between the Lea and the Roding. On the other side of the Roding Hainault Forest is traceable, but was disafforested in 1851. The oak is the principal tree; a noteworthy example was that of Fairlop in Hainault, which measured 45 ft. in girth, but was blown down in 1820.

Geology.—The geological structure of the county is very simple: the greater part is occupied by the London clay with underlying Reading beds and Thanet sands, with here and there small patches of Bagshot gravels on elevated tracts, as at High Beech, Langdon Hill, Brentwood and Rayleigh; and occasionally the same beds are represented by the large boulder-like Sarsen stones on the lower ground. In the north, the chalk, which underlies the Tertiary strata over the whole county, appears at the surface and forms the downs about Saffron Walden, Birdbrook and Great Yeldham; it is brought up again by a small disturbance at Grays Thurrock where it is quarried on a large scale for lime, cement and whiting. Small patches of Pleistocene Red Crag rest upon the Eocene strata at Beaumont and Oakley, and are very well exposed at Walton-on-the-Naze where they are very fossiliferous. Most of the county is covered by a superficial deposit of glacial drifts, sands, gravel and in places boulder clay, as at Epping, Dunmow and Hornchurch where the drift lies beneath the Thames gravel. An interesting feature in relation to the glacial drift is a deep trough in the Cam valley revealed by borings to be no less than 340 ft. deep at Newport; this ancient valley is filled with drift. In the southern part of the county are broad spreads of gravel and brick earth, formed by the Thames; these have been excavated for brick-making and building purposes about Ilford, Romford and Grays, and have yielded the remains of hippopotamus, rhinoceros and mammoth. More recent alluvial deposits are found in the valley at Walthamstow and Tilbury, in which the remains of the beaver have been discovered.

The roads of this county with a clay soil foundation were for generations repaired with flints picked by women and children from the surface of the fields. Gravel is difficult of access. With the exception of chalk for lime (mainly obtained at Ballingdon in the north and Grays in the south), septaria for making cement, and clay for bricks, the underground riches of the county are meagre.

Agriculture.—As an agricultural county Essex ranks high. Some four-fifths of the total area is under cultivation, and about one-third of that area is in permanent pasture. Wheat, barley and oats, in that relative order, are the principal grain crops, Essex being one of the chief grain-producing counties. The wheat and barley are in particularly high favour, the wheat of various standard species being exported for seed purposes, while the barley is especially useful in malting. Beans and peas are largely grown, as are vegetables for the London market. Hop-growing was once important. From the comparative dryness of the climate Essex does not excel in pasturage, and winter grazing receives the more attention. The numbers of cattle increase steadily, and store bullocks are introduced in

large numbers from Norfolk, Lincolnshire, Ireland and Wales. Of sheep there are but few distinct flocks, and the numbers decrease. Pigs are generally of a high-class Berkshire type.

Other Industries.—The south-west of the county, being contiguous to London, is very densely populated, and is the seat of large and varied industries. For example, there are numbers of chemical works, the extensive engine shops and works of the Great Eastern railway at Stratford, government powder works in the vicinity of Waltham Abbey, and powder stores at Purfleet on the Thames. The extensive water-works for east London, by the Lea near Walthamstow, may also be mentioned. The docks at Plaistow and Tilbury on the Thames employ many hands. Apart from this industrial district, there are considerable engineering works, especially for agricultural implements, at Chelmsford, Colchester and elsewhere; several silk works, as at Braintree and Halstead; large breweries, as at Brentwood, Chelmsford and Romford; and lime and cement works at Grays Thurrock. The oyster-beds of the Colne produce the famous Colchester natives, and there are similar beds in the Crouch and Roach, for which Burnham-on-Crouch is the centre; and in the Blackwater (Maldon).

Communications.—Railway communications are supplied principally by the Great Eastern railway, of which the main line runs by Stratford, Ilford, Romford, Brentwood, Chelmsford, Witham, Colchester, and Manningtree. The Cambridge and northern line of this company, following the Lea valley, does not touch the county until it diverges along the valley of the Stort. The chief branches are those to Southend and Burnham, Witham to Maldon, Colchester to Brightlingsea, to Clacton and to Walton, and Manningtree to Harwich, on the coast; and Witham to Braintree and Bishop’s Stortford, and Mark’s Tey to Sudbury and beyond, inland; while there are several branch lines among the manufacturing and residential suburbs in the south-west, to Walthamstow and Buckhurst Hill, Chigwell, Loughton, Epping, Ongar, &c. The London, Tilbury & Southend railway, following the Thames, serves the places named, and the Colne Valley railway runs from Chappel junction near Mark’s Tey by Halstead to Haverhill.

On the Thames, besides the great docks at Plaistow (Victoria and Albert) and the deep-water docks at Tilbury, the principal calling places for vessels are Grays, Purfleet and Southend, while Barking on the Roding has also shipping trade, and the Lea affords important water-connexions. Elsewhere, the principal port is Harwich, at the mouth of the Stour, one of the chief ports of England for European passenger traffic. Other towns ranking as lesser estuarine ports are: Brightlingsea and Wivenhoe on the Colne, forming a member of the Cinque Port of Sandwich; Colchester, Maldon on the Blackwater, and Burnham-on-Crouch. The Stour, Chelmer, and Lea and Stort are the principal navigable inland waterways.

Population and Administration.—The area of the ancient county is 986,975 acres, with a population in 1891 of 785,445 and in 1901 of 1,085,771. The area of the administrative county is 979,532 acres. The county contains nineteen hundreds. It is divided into eight parliamentary divisions, and it also includes the parliamentary boroughs of Colchester and West Ham, the latter consisting of two divisions. Each of these returns one member. The county divisions are—Northern or Saffron Walden, North-eastern or Harwich, Eastern or Maldon, Western or Epping, Mid or Chelmsford, South-eastern, Southern or Romford, South-western or Walthamstow, returning one member each. The municipal boroughs are—Chelmsford (12,580), Colchester (38,373), East Ham (96,018), Harwich (10,070), Maldon(5565), Saffron Walden (5896), Southend-on-Sea (28,857), and one county borough, West Ham (267,358). The following are the other urban districts—Barking Town (21,547), Braintree (5330), Brentwood (4932), Brightlingsea (4501), Buckhurst Hill (4786), Burnham-on-Crouch (2919), Chingford (4373), Clacton (7456), Epping (3789), Frinton-on-Sea (644), Grays Thurrock (13,834), Halstead (6073), Ilford (41,234), Leigh-on-Sea (3667), Leyton (98,912), Loughton (4730), Romford (13,656), Shoeburyness (4081), Waltham Holy Cross (6549), Walthamstow (95,131), Walton-on-the-Naze (2014), Wanstead (9179), Witham (3454), Wivenhoe (2560), Woodford (13,798). Essex is in the South-eastern circuit, and assizes are held at Chelmsford. The boroughs of Harwich and Southend-on-Sea have separate commissions of the peace, and the boroughs of Colchester, Maldon, Saffron Walden and West Ham have, in addition, separate courts of quarter sessions. The county is ecclesiastically within the diocese of St Albans (with a small portion within that of Ely) and is divided into two archdeaconries; containing 452 parishes or districts wholly or in part. There are 399 civil parishes.

There is a military station and depot for recruits at Warley, and a garrison at Tilbury. At Shoeburyness there are a school of gunnery and an extensive ground for testing government artillery of the largest calibre.

History (see also below under Essex, Kingdom of).—Essex probably originated as a shire in the time of Æthelstan. According to the Domesday Survey it comprised nineteen hundreds, corresponding very closely in extent and in name with those of the present day. The additional half-hundred of Thunreslan on the Suffolk border has disappeared; Witbrictesherna is now Dengie; and the liberty of Havering-atte-Bower appears to have been taken out of Becontree. Essex and Hertfordshire were under one sheriff until the time of Elizabeth. At the time of the Survey Count Eustace held a vast fief in Essex, and the court of the Honour of Boulogne was held at Witham. Bentry Heath in Dagenham, Hundred Heath in Tendring and Castle Hedingham in Hinckford were the meeting-places of their respective hundreds. The stewardship of the forest of Essex was held by the earls of Oxford until deprived of it for adherence to the Lancastrian cause. In 1421 certain parts of Essex inherited by Henry V. from his mother were brought under the jurisdiction of the duchy of Lancaster.

Essex was part of the see of London from the time of the foundation of the bishopric in the 7th century. The archdeaconries are first mentioned in 1108; that of Essex extended over the south of the county and in 1291 included eight deaneries; the north of the county was divided between the archdeaconries of Middlesex and Colchester, comprising three and six deaneries respectively. Colchester was constituted a suffragan bishopric by Henry VIII. In 1836 Essex was transferred to the diocese of Rochester, with the exception of nine parishes which remained in London. In 1845 the archdeacon of Middlesex ceased to exercise control in Essex, and the deaneries were readjusted. In 1875 Essex was transferred to the newly created diocese of St Albans, and in 1877 the archdeaconry of Essex was subdivided into eighteen deaneries and that of Colchester into sixteen.

Owing to its proximity to the capital Essex was intimately associated with all the great historical struggles. The nobility of Essex took a leading part in the struggle for the charter, and of the twenty-four guardians of the charter, four were Essex barons. The castles of Pleshey, Colchester, and Hedingham were held against the king in the Barons' War of the reign of Henry III., and 5000 Essex men joined the peasant rising of 1381. During the Wars of the Roses the Lancastrian cause was supported by the de Veres, while the Bourchiers and Lord Fitz-Walter were among the Yorkist leaders. Several Essex men were concerned in the Gunpowder Plot, and in the Civil War of the 17th century the county rendered valuable aid to the parliament.

After the Conquest no Englishman retained estates in Essex of any importance, and the chief lay barons at the time of the Survey were Geoffrey de Mandeville and Aubrey de Vere. The de Veres, earls of Oxford, were continuously connected with the county until the extinction of the title two centuries ago. Pleshey was the stronghold of the Mandevilles, and, although the house became extinct in 1189, its descendants in the female line retained the title of earls of Essex. The Honour of Hatfield Peverel held by Ranulf Peverel after the Conquest escheated to the crown in the reign of Henry I., and in the same reign the fief of Robert Gernon passed to the house of Mountfichet.

Essex has always been mainly an agricultural county, and the ordinary agricultural pursuits were carried on at the time of the Domesday Survey, which also mentions salt-making, wine-making, bee-culture and cheese-making, while the oyster fisheries have been famous from the earliest historic times. The woollen industry dates back to Saxon times, and for many centuries ranked as the most important industry. Cloth-weaving was introduced in the 14th century, and in the 16th century Colchester was noted for its "bays and says." Colchester also possessed a valuable leather industry in the 16th century, at which period Essex was considered an exceptionally wealthy and prosperous county; Norden, writing in 1594, describes it as "moste fatt, frutefull, and full of all profitable things." The decline of the cloth industry in the 17th century caused great distress, but a number of smaller industries began to take its place. Saffron-culture and silk-weaving were extensively carried on in the 17th century, and the 18th century saw the introduction of the straw-plait industry, potash-making, calico-printing, malting and brewing, and the manufacture of Roman cement.

The county returned four members to parliament in 1290. From 1295 it returned two members for the county and two for Colchester. Maldon acquired representation in 1331 and Harwich in 1604. Under the Reform Act of 1832 the county returned four members in four divisions. Under the Representation of the People Act of 1868 Maldon and Harwich each lost one member, and the county returned six members in three divisions.

Antiquities.—It is supposed by many antiquaries that Saxon masonry can be detected in the foundations of several of the Essex churches, but, with the exception of Ashingdon church tower, believed to have been erected by Canute after his victory over Edmund Ironside, there is no obviously recognizable building belonging to that period. This is probably to be in part ascribed to the fact that the comparative scarcity of stone and the unusual abundance of timber led to the extensive employment of the latter material. Several of the Essex churches, as Blackmore, Mountnessing, Margaretting, and South Benfleet, have massive porches and towers of timber; and St Andrew's church, Greenstead, with its walls of solid oak, continues an almost unique example of its kind. Of the four round churches in England one is in Essex at Little Maplestead; it is both the smallest and the latest. The churches of South Weald, Hadleigh, Blackmore, Heybridge and Hadstock may be mentioned as containing Norman work; with the church of Castle Hedingham for its fine Transitional work; Southchurch, Danbury and Boreham as being partly Early English; Ingatestone, Stebbing and Tilty for specimens of Decorated architecture; and Messing, Thaxted, Saffron Walden, and the church of St Peter ad Vincula at the small town of Coggeshall, near Colchester, as specimens of Perpendicular. Stained glass windows have left their traces in several of the churches, the finest remains being those of Margaretting, which represent a tree of Jesse and the daisy or herb Margaret. Paintings have evidently been largely used for internal decoration: a remarkable series, probably of the 12th century, but much restored in the 14th, exists in the chancel of Copford church; and in the church at Ingatestone there was discovered in 1868 an almost unique fresco representation of the seven deadly sins. The oldest brasses preserved in the county are those of Sir William Fitz-Ralph at Pebmarsh, about 1323; Richard of Beltown, at Corringham, 1340; Sir John Gifford, at Bowers Gifford, 1348; Ralph de Kneyton, at Aveley, 1370; Robert de Swynbourne, at Little Horkesley, 1391; and Sir Ingelram de Bruyn, at South Ockendon, 1400. The brass of Thomas Heron, aged 14, at Little Ilford, though dating only from 1517, is of interest as a picture of a schoolboy of the period. Ancient wooden effigies are preserved at Danbury, Little Leighs and Little Horkesley.

Essex was rich in monastic foundations, though the greater number have left but meagre ruins

behind. The Benedictines had an abbey at Saffron Walden, nunneries at Barking and Wickes, and priories at Earl's or Monk's Colne and Castle Hedingham; the Augustinian canons had an abbey at Waltham (see Waltham Abbey; the portion remaining shows Norman work of the finest character), priories at Thoby, Blackmore, Bicknacre, Little Leighs, Little Dunmow and St Osyth (see Brightlingsea); there were Cistercian abbeys at Coggeshall, Stratford and Tilty; the Cluniac monks were settled at Prittlewell, the Premonstratensians at Beleigh Abbey, and the Knights Hospitallers at Little Maplestead. Barking Abbey is said to date its first origin from the 7th century; most of the others arose in the 12th and 13th centuries. Besides the keep at Colchester there is a fine Norman castle at Castle Hedingham, and two dilapidated round towers still stand at Hadleigh near Southend. Ongar, the house of the de Lacys, and Pleshey, the seat of the earls of Essex, have left only mounds. Havering-atte-Bower, the palace that was occupied by many queens, is replaced by a modern house; Wickham, the mansion of the bishops of London, no longer stands. New Hall, which was successively occupied by Henry VIII., Elizabeth, the earl of Essex, George Villiers, duke of Buckingham, and Cromwell, is now a nunnery of the order of the Holy Sepulchre. Audley End, the mansion of Lord Braybrooke, is a noble example of the domestic architecture of the Jacobean period; Layer Marney is an interesting proof of the Italian influences that were at work in the time of Wolsey. Horeham Hall was built by Sir John Cutt in the reign of Henry VII., and Gosfield Hall is of about the same date.

See Norden, *Speculi Britanniae Pars: an Hist. and Geogr. Descrip. of the County of Essex* (1594) (edited for the Camden Society by Sir Henry Ellis, 1840, from the original MS. in the Marquis of Salisbury's library at Hatfield); Nicholas Tindal, *Hist. of Essex* (1720); N. Salmon, *The Hist. and Antiq. of Essex* (London, 1740)—based on the collections of James Strangman of Hadleigh (v. *Trans. of Essex Arch. Soc.* vol. ii.); P. Morant, *Hist. and Antiq. of the County of Essex* (London, 1768); P. Muilman, *New and Complete Hist. of Essex from a late Survey, by a Gentleman* (Chelmsford, 6 vols., 1770-1772, London, 1779); Elizabeth Ogbourne, *Hist. of Essex* (London, part i., 1814); *Excursions through Essex, illustrated with one hundred engravings* (2 vols., London, 1818); T. Wright, *Hist. and Topography of Essex* (1831); W. Berry, *Pedigrees of Families in Essex* (1841); A. Suckling, *Memorials of the Antiquities, &c., of the County of Essex* (London, 1845); W. Andrews (ed.), *Bygone Essex* (London, 1892); J.T. Page (ed.), *Essex in the Days of Old* (London, 1898); *Victoria County History, Essex; Transactions of the Essex Arch. Soc.* from 1858. An account of various MS. collections connected with the county is given by H.W. King in vol. ii. of the *Transactions* (1863).

ESSEX, KINGDOM OF, one of the kingdoms into which Anglo-Saxon Britain was divided, properly the land of the East Saxons. Of its origin and early history we have no record except the bare statement of Bede that its settlers were of the Old Saxon race. In connexion with this it is interesting to notice that the East Saxon dynasty claimed descent from Seaxneat, not Woden. The form Seaxneat is identical with Saxnot, one of three gods mentioned in a short continental document probably of Old Saxon origin. Bede does not mention this kingdom in his narrative until 604, the year of the consecration of Mellitus to the see of London. The boundaries of Essex were in later times the rivers Stour and Thames, but the original limits of the kingdom are quite uncertain; towards the west it probably included most if not the whole of Hertfordshire, and in the 7th century the whole of Middlesex. In 604 we find Essex in close dependence upon Kent, being ruled by Saberht, sister's son of Æthelberht, under whom the East Saxons received Christianity. The three sons of Saberht, however, expelled Mellitus from his see, and even after their death in battle against the West Saxons, Eadbald of Kent was unable to restore him. In the year 653 we find North-umbrian influence paramount in Essex, for King Sigeberht at the instance of Oswio became a Christian and received Cedd, the brother of St Chad, in his kingdom as bishop, Tilbury and *Ythanceastere* (on the Blackwater) being the chief scenes of his work. Swithhelm, the successor of Sigeberht, was on terms of friendship with the East Anglian royal house, King Æthelwald being his sponsor at his baptism by Cedd. It was probably about this time that Erconwald, afterwards bishop of London, founded the monastery of Barking. Swithhelm's successors Sigehere and Sebbe were dependent on Wulfhere, the powerful king of Mercia, who on the apostasy of Sigehere sent Bishop Jaruman to restore the faith. There are grounds for believing that an East Saxon conquest of Kent took place in this reign. A forged grant of Ceadwalla speaks of the fall of Kent before Sigehere as a well-known event; and in a Kentish charter dated 676 a king of Kent called Swebhard grants land with the consent of his father King Sebbe. In 692 or 694 Sebbe abdicated and received the monastic vows from Waldhere, the successor of Erconwald at London. His sons Sigeheard and Swefred succeeded him as kings of Essex, Sigehere being apparently dead. As the laws of Ine of Wessex speak of Erconwald as "my bishop," it is possible that the influence of Wessex for a short time prevailed in Essex; but a subsequent charter of Swefred is approved by Coenred of Mercia, and Offa, the son of Sigehere, accompanied the same king to Rome in 709. From this time onwards the history of Essex is almost a blank. In 743 or 745 Æthelbald of Mercia is found granting privileges at the port of London, and perhaps the western portion of the kingdom had already been annexed, for henceforward London is frequently the meeting-place of the Mercian council. The violent death of Selred, king of Essex, is mentioned in the *Saxon Chronicle* under the year 746; but we have no more information of historical importance until the defeat of the Mercian king Beornwulf in 825, when Essex, together with Kent, Sussex and Surrey, passed into the hands of Ecgbert, king of Wessex. After 825 we hear of no more kings of Essex, but occasionally of

earls. About the year 870 Essex passed into the hands of the Danes and was left to them by the treaty between Alfred and Guthrum. It was reconquered by Edward the Elder. The earldom in the 10th century apparently included several other counties, and its most famous holder was the ealdorman Brihtnoth, who fell at the battle of Maldon in 991.

The following is a list of kings of Essex of whom there is record: Saberht (d. *c.* 617); three sons of Saberht, including probably Saweard and Seaxred; Sigeberht (Parvus); Sigeberht II.; Swithhelm (d. *c.* 664); Sigehere (reigned perhaps 664-689); Sebbe, son of Seaxred (664-694); Sigeheard (reigning in 693-694); Swefred (reigning in 693-694 and in 704); the two last being sons of Sebbe; Swebriht (d. 738); Selred (d. 746); Swithred, grandson of Sigeheard (succ. 746); Sigeric, son of Selered (abd. 798); Sigered, son of Sigeric (reigning in 823).

See Bede, *Hist. Eccl.*, edited by C. Plummer (Oxford, 1896), ii. 3, 5; *Saxon Chronicle* (Earle and Plummer, Oxford, 1899), *s.a.* 823, 894, 904, 913, 921, 994; William of Malmesbury, *Gesta Regum*, Rolls Series (ed. Stubbs, 1887-1889); *Simeon of Durham, s.a.* 746 (ed. T. Arnold, 1882) and appendix, *s.a.* 738; Florence of Worcester (ed. B. Thorpe, London, 1848-1849); H. Sweet, *Oldest English Texts*, p. 179 (London, 1885).

(F. G. M. B.)

ESSLINGEN, a town of Germany, in the kingdom of Württemberg, in a fertile district on the Neckar, 9 m. S.E. from Stuttgart, on the railway to Ulm. Pop. (1905) 29,750. It is surrounded by medieval walls with towers and bastions, and has thirteen suburbs, one lying on an island in the river. On a commanding height above the town lies the old citadel. The inner town has an old (1430) and a new Rathaus, the latter, formerly a palace, an exceedingly handsome edifice. The church of Our Lady (Frauenkirche) is a fine Gothic building of the 15th century, and has a beautifully sculptured doorway and a lattice spire 240 ft. high. The church of St Dionysius dated from the 13th century, and possesses a fine screen and a ciborium of 1486. Esslingen possesses several schools, a theatre and a richly endowed hospital, while its municipal archives contain much valuable literature bearing especially on the period of the Reformation. The town has railway, machine and electrical works; cloth, gloves and buttons are also manufactured here, and there are spinning-mills. There is a large lithographic establishment, and a considerable trade is done in wine and fruit, the wines of Esslingen being very famous.

Esslingen, which dates from the 8th century, became a town in 886. It was soon a place of importance; it became a free imperial city in 1209 and was surrounded with walls by order of the emperor Frederick II. Its liberty was frequently threatened by the rulers of Württemberg, but it did not become part of that country until 1802.

See K.H.S. Pfaff, *Geschichte der Reichsstadt Esslingen* (Esslingen, 1852); and Ströhmfeld, *Esslingen in Wort und Bild* (Esslingen, 1902).

ESTABLISHMENT (O. Fr. *establissement*, Fr. *établissement*, late Norm. Fr. *establishement*, from O. Fr. *establir*, Fr. *établir*, Lat. *stabilire*, to make stable), generally the act of establishing or fact of being established, and so by transference a thing established. Thus we may speak of the establishment (*i.e.* setting up) of a business, the “long establishment” of a business, and of the manager of “the establishment.” In a special sense the word is applied, with something of all the three above-mentioned connotations, to certain religious bodies in their relation to the state. It is with this latter that the present article is concerned.

Perhaps the best definition which can be given, and which will cover all cases, is that establishment implies the existence of some definite and distinctive relation between the state and a religious society (or conceivably more than one) other than that which is shared in by other societies of the same general character. Of course, a certain relationship must needs exist between the state and every society, religious or secular, by virtue of the sovereignty of the state over each and all of its members. Every society must possess certain principles or perform certain acts, and the state may make the profession of such principles unlawful, or impose a penalty upon the performance of such acts; and, moreover, every society is liable before the law as to the fulfilment of its obligations towards its members and the due administration of its property should it possess any. With all this establishment has nothing to do. It is not concerned with what pertains to the religious society *qua* society, or with what is common to all religious societies, but with what is exceptional. It denotes any special connexion with the state, or privileges and responsibilities before the law, possessed by one religious society to the exclusion of others; in a word, establishment is of the nature of a monopoly. But it does not imply merely privilege. The state and the Church have mutual obligations towards one

another: each is, to some extent, tied by the existence of this relationship, and each accepts the limitations for the sake of the advantages which accrue to itself. The state does so in view of what it believes to be the good of all its members; for "the true end for which religion is established is not to provide for the true faith, but for civil utility" (Warburton), even if the latter be held to be implied in the former. On the other hand, the Church accepts these relations for the facilities which they involve, *i.e.* for its own benefit. It will be seen that this definition excludes, and rightly, many current presuppositions. Establishment affirms the *fact*, but does not determine the precise *nature*, of the connexion between the state and the religious society. It does not tell us, for example, when or how it began, whether it is the result of an unconscious growth (as with the Gallican Church previous to the French Revolution), or of a determinate legislative act (as with the same Church re-established by the Concordat of 1801). It does not tell us whether an endowment of the religious society by the state is included; what particular privileges are enjoyed by the religious society; and what limitations are placed upon the free exercise of its life. These things can only be ascertained by actual inquiry; for the conditions are precisely similar in no two cases.

To proceed to details. At the present day there is no established religion in the United States, the German empire as a whole, Holland, Belgium, France and Austria-Hungary (saving, indeed, "the rights of the sovereign arising from ecclesiastical dignity"[1]); whereas there are religious establishments in Russia, Greece, Sweden, Norway, Denmark, Prussia,[2] Spain, Portugal and even in Italy, as well as in England and Scotland. These, however, differ greatly amongst themselves. In Russia the "Orthodox Catholic Eastern" is the state religion. The emperor is, by the fundamental laws of the empire, "the sovereign defender and protector of the dogmas of the dominant faith, who maintains orthodoxy and holy discipline within the Church," although, of course, he cannot modify either its dogmas or its outward order. Further, "the autocratic (*i.e.* imperial) power acts in the ecclesiastical administration by means of the Most Holy Ruling Synod, created by it"; and all the officers of the Church are appointed by it. The enactments of the Synod do not become law till they have received the emperor's sanction, and are then published, not in its name but in his; and a large part of the revenues of the Church is derived from state subsidies. In Greece "the dominant religion (Ἡ ἐπικρατοῦσα θρησκεία) is that of the Eastern Orthodox Church of Christ"; and although toleration is otherwise complete, no proselytism from the Church of Greece is allowed. The king swears to protect it, but no powers pertain to him with regard to it such as those which the tsar enjoys; the present king is not a member of it, but his successors must be. In Sweden, Lutheranism was adopted as the state religion by the synod of Upsala (*Upsala möte*) in 1593, and the king must profess it. The "Lutheran Protestant Church" retains an episcopal order, and is supported out of its own revenues. Archbishops and bishops are chosen by the king out of those names submitted to him, and he also nominates to royal peculiars. The ecclesiastical law (*Kyrkolag*), first constituted in 1686, is part of the law of the state, but may not be modified or abrogated without consent of a General Synod; and although *ad interim* interpretations of that law may be given by the king on the advice of the Supreme Court, since 1866 these have been subject to review and rejection by the next General Synod. In Norway the "Evangelical-Lutheran" is the "official religion," but the Church is supported by the state, its property having been secularized. It is also more subject to the king, who by the constitution is to "regulate all that concerns divine service and the clergy," and to see that the prescribed order is carried out. It is much the same in Denmark, where, however, the "Evangelical-Lutheran Church" has since the fundamental constitutional law of the 5th of June 1849 been officially described as the National Church (*Folkekirche*) instead of the State Church (*Statskirche*) as formerly, and the constitution provides for its regulation by further legislation, which has not yet been passed. For Prussia, see under that heading; it need only be added that self-government still tends to increase, but that the emperor William II. has exercised his office as *summus episcopus* more freely than most of his predecessors. In Spain the "Catholic, Apostolic and Roman" religion is that of the state, "the nation binds itself to maintain its worship and its ministers," and the rites of any other religion are only permitted in private. The patriarch of the Indies and the archbishops are senators by right, and the king may nominate others from amongst the bishops; only laymen may sit in the chamber of deputies. Convents were suppressed, and their property confiscated, in 1835 and 1836; in 1859 the remaining ecclesiastical property was exchanged for untransferable government securities and the support of the clergy of the State Church is assured by an unrepealed law previous to the present constitution. In Portugal it is much the same, but all the home bishops sit in the upper chamber as peers (*Pares do Reino*) by right, and there is no restriction on membership of the chamber of deputies. A more important point is that the king confers all ecclesiastical benefices and nominates the bishops, instead of their being chosen, as in Spain, by agreement between the civil power and the papacy. In Italy, in spite of the feud between the papacy and the civil power, the fact remains that, by the *Statuto fondamentale*, "the Catholic, Apostolic and Roman religion is the sole religion of the state," and the king may nominate "archbishops and bishops of the state" to be senators. The *Legge sulle prerogative del Summo Pontifice*, &c., or "Law of Guarantees," by which the papal prerogatives are secured, has been declared by the Council of State to be a fundamental law; and while many civil restrictions upon the activities of the Church are removed by it, outside Rome and the suburbicarian dioceses the royal *exequatur* is still required before a bishop is installed. Moreover, the bulk of Church property having been secularized, the Italian clergy receive a stipend from the state.

Establishment is, of course, a distinctively English term, but it implies precisely the same thing as "Staatsreligion" or "église dominante" does elsewhere, neither more nor less. It denotes the

Church and State in Britain.

existence of a special relationship between Church and state without defining its precise nature. The statement that the Church of England or the Scottish Kirk is "established by law" denotes that it has a peculiar status before the law; but that is all. (*a*) There is no basis whatever for the once popular assumption that the word "established" as applied to the Church means "created," or the like; on the contrary, the modern use of the word in this sense is a misleading perversion. To *establish* is to make firm or stable; and a thing cannot be established unless it is already in existence. A few examples will make it clear that this is the true sense of the word, and that in which it is used here. "Stablish the thing, O God, that thou hast wrought in us" (Ps. lxviii. 28, P.B.; A.V. and R.V. "strengthen") implies that the thing is already wrought; it could not be "stablished" else. "Stablish your hearts" (Jas v. 8) implies that the hearts are already in existence. "Until he had her settled in her raine With safe assuraunce and establishment" (*Faerie Queene*, v. xi. 35) would have been impossible unless the reign had already begun. This is the meaning of the words in many Tudor acts of parliament, "be it enacted, ordained and established," or the like (21 Hen. VIII. c. 1; 27 Hen. VIII. c. 28, s. 9; 28 Hen. VIII. c. 13 [Ireland]; 28 Hen. VIII. c. 18 [Ireland]; 33 Hen. VIII. c. 27; 1 Eliz. c. 1, ss. 15, 17; 1 Eliz. c. 4, s. 4); that which is then and there enacted is to be valid for the future. (*b*) Nor is it necessarily implied that establishment is a process completed once for all. Every law touching the Church slightly alters its conditions; everything that affects the relations of Church and state may be regarded as a measure of establishment or the reverse. When the two Houses of Parliament, in an address to William III. after his coronation, spoke of their proposed measures of toleration, the king said in his reply, "I do hope that the ease which you design to Dissenters will contribute very much to the establishment of the Church" (Cobbett, *Parl. Hist.* v. 218). And Defoe (in 1702) published an ironical tract with the title, *The Shortest Way with the Dissenters, or Proposals for the Establishment of the Church*. (*c*) Nor is it necessarily implied that there was any specific time at which establishment took place. Such may indeed be the case, as with the Kirk in Scotland; but it certainly cannot be said that the English Church was established at any particular time, or by any particular legislative act. There were, no doubt, periods when the existing relations between Church and state were modified or re-defined, notably in the 16th and 17th centuries; but the relations themselves are far older. In fact, they existed from the very first: the English Church and state grew up side by side, and from the beginning they were in close relations with one another. But although the state of things which it represented was there from the first, the term "established" or "established by law" only came into use at a later date. Until there was some other religious society to be compared with it such a distinctive epithet would have had no point. As, however, there arose religious societies which had no status before the law, it became more natural; and yet more so when the formularies of the Church came to be "established" by civil sanctions (the Books of Common Prayer by 5 and 6 Edw. VI. c. 1, s. 4, &c; the Articles by 13 Eliz. c. 12; the new Ordinal by 13 and 14 Car. II. c. 4, title). Accordingly the Church itself came to be spoken of as established by law; first, it would seem, in the Canons of 1604, and subsequently in many statutes (Act of Settlement, 6 Anne, c. 8 and c. 11, &c). In all such cases the Church is described as already established, not as being established by the particular canon or statute. In other words, the constitutional status of the Church is affirmed, but nothing is said as to how it arose.

The legislative changes of the 16th and 17th centuries brought "establishment" into greater prominence and greatly modified its conditions, but a moment's thought will show that it did not begin then. If, *e.g.*, all post-Reformation ecclesiastical statutes were non-existent, the relations between Church and state would be very different, but there would still be an "establishment." The bishops would sit in the House of Lords, the clergy would tax themselves in convocation, the Church courts would possess coercive jurisdiction, and so on. The present relations of Church and state in England may be briefly summed up as follows:—(1) *The personal relation of the crown to the Church,* including (*a*) restraints upon the action of convocation (formulated by 25 Hen. VIII. c. 19); (*b*) nomination of bishops, &c. (25 Hen. VIII. c. 20); (*c*) power of supervision as visitor, long disused (26 Hen. VIII. c. 1; 1 Eliz. c. 1, s. 17); (*d*) power of receiving appeals as the fount of civil justice (25 Hen. VIII. c. 19, &c). In connexion with these, it must be borne in mind that (*a*) the holder of the crown receives coronation from the church and takes an oath having reference to it (1 Will. III. c. 6), and (*b*) the crown is held on the condition of communion with the Church of England (Act of Settlement; the conditions of communion are laid down in the Prayer Book, which itself is sanctioned by law). (2) *The relation of the Church to the crown in parliament.* No change has been permitted in its doctrine or formularies without the sanction of an act of parliament. (3) *Privileges of the Church and clergy.* Of these may be mentioned (*a*) the coercive jurisdiction of the Church courts; (*b*) the right of bishops to sit in the House of Lords. It need hardly be said that establishment in England does not include an endowment of the Church by the state. Nothing of the kind ever took place on any large scale, and the grants for Church purposes in the 18th century are comparable with the *regium donum* to Nonconformists.

The position of the Church of Ireland until its disestablishment (see below) was not dissimilar. With Scotland the case is different. The establishment of the Kirk was an entirely new process, carried out by a more or less definite series of legislative and administrative acts. The Convention of Estates which met at Edinburgh in 1560 ordered the drawing up of a new Confession of Faith, which was done in four days by a committee of preachers, and on the 24th of August it passed three acts, one abolishing the pope's authority and all jurisdiction of Catholic prelates, another repealing the old statutes in favour of the Old Church, the third forbidding the celebrating and hearing of mass under penalty of imprisonment, exile and death. The intention was to make a clean sweep of the Old

Church, which was denounced as “the Kirk Malignant.”[3] The new model thus set up was confirmed by the Scottish act of 1567, c. 6, which declared it to be “the onely true and halie kirk of Jesus Christ within this realme.” Again, after the revolution of 1688 had put an end to the attempts of the Stuart kings to impose the episcopal model on Scotland, by the act of 1690, c. 5, the crown and estates “ratifie and establish the Confession of Faith, ... as also they do establish, ratifie and confirm the Presbyterian government and discipline.” The “Act of Security” of 1705, as incorporated in the Act of Union 1706, speaking of it “as now by law established,” says that “Her Majesty ... doth hereby establish and confirm” it, and finally declares this act, “with the Establishment therein contained,” to be “a fundamental and essential condition of the Union.” Nevertheless, the conditions of establishment in the Scottish Kirk are much easier than those of the Church of England. It is bound by the statutes sanctioning its doctrine and order, but within these limits its legislative and judicial freedom is unimpaired. A royal commissioner is present at the meetings of the general assembly, but he need not be a member of the Kirk; and there is no constitutional tie between the crown and the Kirk such as there is in England. There is what may accurately be described as a state endowment, the bulk of the property of the Old Church having been conferred upon the Scottish Kirk.

Not unnaturally the organization of Anglican Churches in the colonies was followed in some cases by their establishment, which included endowment. It was so, for example, in the East and West Indies; and the disestablishment of the West Indian Church in 1868 was followed, in 1873, by a re-establishment of the Church in Barbados by the colonial legislature. India is the only other part of the empire (outside Great Britain) in which there is to-day a religious establishment.

The Colonies.

Disestablishment is in theory the annulling of establishment; but since an established Church is usually rich, disestablishment generally includes disendowment, even where there is no state endowment of religion. It is, in short, the abrogation of establishment, coupled with such a confiscation of Church property as the state thinks good in the interests of the community. The disestablishment of the West Indian Church in 1868 has already been referred to; in 1869 the Irish Church Disestablishment Bill was passed. Private bills relating to Scotland have more than once been brought forward. In 1895 the Liberal government introduced a suspensory bill, intended as the preliminary step towards disestablishing and disendowing the Church in Wales; it was withdrawn, however, in the same session, and the question of Welsh disestablishment slumbered until in 1906 a royal commission was appointed by the Liberal government to inquire into the subject, and in 1909 a bill was introduced on much the same lines as in 1895.

Disestablishment.

The case of the Irish Church will illustrate the process of disestablishment, although, of course, the precise details would vary in other cases. The Irish Church Act was passed in 1869 by Gladstone’s first government, after considerable opposition, and provided that from January 1, 1871, the union created by statute between the Churches of England and Ireland should be dissolved, and the Church of Ireland should “cease to be established by law.” Existing ecclesiastical corporations were dissolved, and their rights ceased, compensation being given to all individuals and their personal precedence being secured for life. All rights of patronage, including those of the crown, were abolished, with compensation in the case of private patrons; and the archbishops and bishops ceased to have the right of summons to the House of Lords. All laws restraining the freedom of action of the Church were repealed; the ecclesiastical law, however, to subsist by way of contract amongst the members of the Church (until altered by a representative body). Provision was made for the incorporation by charter of the representative body of the Church, should such a body be found, with power to hold landed property. All existing ecclesiastical property was vested in a commission, which was to give compensation for life interests, to transfer to the new representative body the churches, glebe houses, and £500,000 in compensation for endowments by private persons since 1660, and to hold the rest for such purposes as parliament might thereafter determine.

Authorities.—F.R. Dareste, *Les Constitutions modernes* (Paris, 1891); H. Geffcken, *Church and State*, trans. by E.F. Taylor (London, 1877); P. Schaff, *Church and State in the United States* (Papers of the American Hist. Association, vol. ii. No. 4), (New York, 1888); L. Minghetti, *Stato e Chiesa* (Milan, 1878), French translation, with Introd. by E. de Laveleye (Paris, 1882); C. Cadorna, *Religione, diritto, libertà* (Milan, 1893); F. Nippold, *Die Theorie der Trennung von Kirche und Staat* (Bern, 1881); W. Warburton, *Alliance between Church and State* (London, 1741) (*Works*, vol. iv., ed. Hurd, London, 1788); *Church Problems* (ed. by H.H. Henson) (London, 1900); Essays on “Establishment” and “Disendowment”; W.R. Anson, *Law and Custom of the Constitution*, vol. ii. chap. ix. (Oxford, 1892); Phillimore, *Ecclesiastical Law* (London, 1895); J.S. Brewer, *Endowments and Establishment of the Church of England* (ed. by L.T. Dibdin, London, 1885); A.T. Innes, *Law of Creeds in Scotland* (Edinburgh, 1867); E.A. Freeman, *Disestablishment and Disendowment* (London, 1883); G. Harwood, *Disestablishment* (London, 1876); *Annales de l’école libre des Sciences politiques*, tom. i. (Paris, 1885), art. “La Séparation de l’Église et de l’État en Angleterre,” by L. Ayral.

(W. E. Co.)

1 In effect this involves the establishment of all religious denominations, for none can exist without the express authorization of the state, and all are subject to more or less interference on its part. Thus the emperor-king is, in his capacity of head of the state, technically “bishop” of the Evangelical Church, the constitution of which was fixed by an imperial patent in 1866 and modified by. another in 1891 (see Herzog-Hauck, *Realencykl.* ed. 1904, *s.* “Österreich”).—[Ed.]

2 Also in the other German Protestant states. The relations of the Roman Catholic Church with the various governments are settled by separate concordats with the papacy (see Concordat).

3 Andrew Lang, *Hist. of Scotland*, ii. p. 75 ff. Compare with this the position of the reformers generally in England, where even so stout a Puritan as William Harrison (*Description of England*, 1570) does not dream of separating the organic life of the Church of England from that of the pre-Reformation Church. (Ed).

ESTABLISHMENT OF A PORT, the technical expression for the time that elapses between the moon's transit across the meridian at new or full moon at a given place and the time of high water at that place. The interval (constant at any one place) may vary from 6 mins. (Harwich) to 11 hrs. 45 mins. (North Foreland). At London Bridge it is 1 hr. 58 mins. (See also Tide.)

ESTAING, CHARLES HECTOR, Comte d' (1729-1794), French admiral, was born at the château of Ruvel, Auvergne, in 1729. He entered the army as a colonel of infantry, and in 1757 he accompanied count de Lally to the East Indies, with the rank of brigadier-general. In 1759 he was made prisoner at the siege of Madras, but was released on parole. Before the ratification of his exchange he obtained command of some vessels, and conducted various naval attacks against the English; and having, on his return to France in 1760, fallen accidentally into their hands, he was, on the ground of having broken his parole, thrown into prison at Portsmouth, but as the charge could not be properly substantiated he was soon afterwards released. In 1763 he was named lieutenant-general in the navy, and in 1777 vice-admiral; and in 1778 he obtained the command of a fleet intended to assist the United States against Great Britain. He sailed on the 13th of April, and between the 11th and the 22nd of July, blockaded Howe at Sandy Hook, but did not venture to attack him, though greatly superior in force. In concert with the American generals, he planned an attack on Newport, preparatory to which he compelled the British to destroy some war vessels that were in the harbour; but before the concerted attack could take place, he put to sea against the English fleet, under Lord Howe, when owing to a violent storm, which arose suddenly and compelled the two fleets to separate before engaging in battle, many of his vessels were so shattered that he found it necessary to put into Boston for repairs. He then sailed for the West Indies on the 4th of November. After a feeble attempt to retake Santa Lucia from Admiral Barrington, he captured St Vincent and Grenada. On the 6th of July 1779 he fought a drawn battle with Admiral John Byron, who retired to St Christopher. Though superior in force, D'Estaing would not attack the English in the roadstead, but set sail to attack Savannah. All his attempts, as well as those of the Americans, against the town were repulsed with heavy loss, and he was finally compelled to retire. He returned to France in 1780. He was in command of the combined fleet before Cadiz when the peace was signed in 1783; but from that time his chief attention was devoted to politics. In 1787 he was elected to the assembly of the notables; in 1789 he was appointed commandant of the national guard; and in 1792 he was chosen admiral by the National Assembly. Though in favour of national reform he continued to cherish a strong feeling of loyalty to the royal family, and on the trial of Marie Antoinette in 1793 bore testimony in her favour. On this account, and because of certain friendly letters which had passed between him and the queen, he was himself brought to trial, and was executed on the 28th of April 1794.

See *Marins et soldats français en Amérique*, by the Viscomte de Noailles (1903); Beatson, *Naval and Military Memoirs of Great Britain*, vol. v.

ESTATE (through O. Fr. *estat*, mod. *état*, from Lat. *status*, state, condition, position, *stare*, to stand), the state or condition in which a man lives, now chiefly used poetically and in such phrases as "man's estate," or "of high estate"; "state" has superseded most of the uses of the word except (1) in property and (2) in constitutional law.

1. In the law of property the word is employed in several senses. In the widest sense a man's estate comprises his entire belongings; so much of it as consists of land and certain other interests associated therewith is his "real estate"; the rest is his "personal estate." The word is more particularly applied to interests in land, and in popular and general use "an estate" means the land itself. The strict technical meaning of "an estate" is an interest in lands, and this conception lies at the root of the English theory of property in land. "The first thing that the student has to do," says Joshua Williams (*Law of Real Property*), "is to get rid of the idea of absolute ownership. Such an idea

is quite unknown to the English law. No man is in law the absolute owner of lands. He can only hold an estate in them." That is, the notion of tenure, of holding by a tenant from a lord, prevails. The last lord of all from whom all land was ultimately held was the king. Persons holding directly from the king and granting to others were the king's tenants *in capite*, and were the mesne lords of their tenants.

Estates in land may be classified according to (1) the quantity of their interest or duration, (2) the time of enjoyment, and (3) the number and connexion of the tenants. According to (1), an estate may be either a freehold of inheritance or a freehold not of inheritance. A freehold of inheritance may be (*a*) an estate in fee simple, which is the largest estate a man can hold in English law, and comes close to the idea of absolute ownership, repudiated by Williams; an estate in fee simple is inheritable by a man's heirs generally, he has full powers of disposition over it, and may alienate the whole or part. (*b*) It may also be in limited fees, which are again subdivided into (i.) qualified or base fee, (ii.) fee conditional, so called at the common law, afterwards, on the passing of the statute *De Donis Conditionalibus*, fee tail, which may be general as to the heirs of a man's body, or special, as to the heirs *male* (or *female*) of his body. A freehold not of inheritance may be either (1) conventional, as an estate for life, which may be either an estate for one's own life or for the life of another (*pur autre vie*); (2) legal, or created by operation of law, as tenancy in tail after possibility of issue extinct (*i.e.* where an estate is given to a man and the heirs of his body by his present wife, and the wife dies without issue, the husband becomes tenant in tail after possibility of issue extinct); tenancy by curtesy (see Curtesy); tenancy in dower (see Dower).

Estates not of freehold or less than freehold are subdivided into (i.) estates for years (often called estates for a term of years, the instrument creating it being termed a *lease* or demise, and the estate itself a *leasehold interest*); (ii.) estates at will, that is, where lands or tenements are let by one man to another to have and to hold at the will of the lessor; (iii.) estates at sufferance, where one comes into possession of land under a lawful title, and continues in possession after his title has determined.

According to (2), estates are either in possession or in expectancy. Estates in expectancy are either (*a*) in remainder, which may be vested or contingent, or (*b*) in reversion (see Remainder, Reversion).

According to (3), estates may be either (i.) in severalty, that is, the holding of an estate by a person in his own right only, without any other person being joined or connected with him in point of interest therein; (ii.) estates in joint tenancy (see Joint); (iii.) coparcenary (*q.v.*); and (iv.) tenancy in common, where two or more hold the same land, by several and distinct titles, but with unity of possession. (See also Real Property.)

2. In constitutional law an estate is an order or class having a definite share as such in the body politic, and participating either directly or by its representatives in the government. The system of representation by estates took its rise in western Europe during the 13th century, at a time when the feudal system was being broken up through various causes, notably the growing wealth and power of the towns. In the feudal council the clergy and the territorial nobles had alone had a voice; but the 13th century, to quote Stubbs (*Const. Hist.* ii. 168, ed. 1875), "turns the feudal council into an assembly of estates, and draws the constitution of the third estate from the ancient local machinery which it concentrates." This is, allowing for differences of detail, true of other countries as well as England. To the two estates already existing, clergy and nobles, is added a third, that of the commons (burgesses and knights of the shire) in England, that of the *roturiers* in France (known as the *tiers état*). This division into three estates became the norm, but it was not universal, nor inevitable.[1] Even in England there was a tendency to create other estates, the king for instance treating with the merchants separately for grants of money to be raised by taxing the general body of merchants in the country; and there was a similar tendency on the part of the lawyers. But for the accident of their sitting and voting together, the burgesses and knights of the shire would also have formed separate estates. In Aragon the cortes contained four estates (*brazos* or arms), the clergy, the great barons (*ricos hombres*), the minor barons (knights or *infanzones*), and the towns. The Swedish diet had also four—clergy, barons, burghers and peasants.

The system of estates, based on the medieval conception of society as divided into definite orders, formed the basis of whatever constitutional forms survived in Europe till the French Revolution. In England, of course, it had early become obscured, the House of Commons representing the whole nation outside the narrow order of the peers. The creation of an estate of lesser nobles or landowners had been prevented by the fusion of the knights of the shire with the burgesses; the spiritual estate was ruled out by the determination of the clergy to deliberate and tax themselves in their own convocation, leaving the bishops, as spiritual peers, to represent their interests in parliament.

The phrase "the three estates of the realm" still survives, but to most men it conveys no clear meaning. The erroneous conception early arose—Hallam says it was current among the popular lawyers of the 17th century—that the "three estates" were king, lords and commons, as representing the three great divisions of legislative authority. Such a conception might be possible in Hungary, where the crown of St. Stephen symbolizes not so much the royal power as the co-ordination of the powers of all the organs of the state, including the king; but in England the king represents the whole nation and in no sense a separate interest within it, which is the essence of an estate. The phrase "three estates" as applied to the English constitution at present is, in fact, misleading. It is now usually understood of the lords spiritual, the lords temporal, and the commons.

The conception of the “three estates of the realm” as the great divisions of legislative authority led in England to the coining of the phrase “fourth estate,” to indicate some power of corresponding magnitude in the state distinct from them. Fielding thus spoke of “the mob,” and Hazlitt of Cobbett; but the phrase is now usually applied to the press, a usage originating in a speech by Burke (Carlyle, *Hero-worship*, Lect. v.).

In the constitutional struggles of the European continent, from the Revolution onward, the rival theories of representation by estates and of popular representation have played a great part. The crucial moment of the French Revolution was when the vote according to “order” was rejected and the estates of the clergy and nobles were merged with the *tiers état*, the states-general thus becoming the National Assembly. This was the precedent followed, generally speaking, during the 19th century in the other countries in which constitutional government was established. In most of 791
them the medieval estates lingered on in provincial diets (*Landtage*),[2] and the famous Article XIII. of the Federal Act (*Bundesakte*) of Vienna decreed that “assemblies of estates” should be set up, wherever not already existing, in the German states. The efforts of Metternich and the statesmen of his school were directed, not so much to abolishing the constitutional model, as to establishing it, if need were, on traditional and conservative lines. This is what was meant by the famous reply of the emperor Francis I. to the Magyar deputation; “All the world is playing the fool and demanding fanciful constitutions.” When the need for making constitutional concessions became urgent, the attempt was accordingly made to base them on the system of estates. But the central diet convoked in 1847 by Frederick William IV. to Berlin, technically a concentration of provincial estates, quickly converted itself as Metternich had prophesied—into a national assembly; and precisely the same thing happened in the case of the first Austrian parliament in 1848. In Hungary the revolution was in some respects more conservative in character. The March Laws of 1848 preserved the general character of the House of Magnates, comparable to the British House of Lords, but converted the Lower House from what was practically representative of the estate of the lesser nobles into a national representative assembly. Of all the sovereign states of Europe only the grand-duchies of Mecklenburg still (1909) retain the ancient system of estates untouched. The diet, which is common to the two duchies, consists of the *Ritterschaft*, in which all tenants in chivalry (*Rittergutsbesitzer*), whether noble or non-noble, have a voice, and the *Landschaft*, which consists of the chief magistrates of the towns. The former is taken as representative of the peasant proprietors and copy-holders (*Hintersassen*), the latter of the burghers.

The plural form ESTATES or STATES (Fr. *états*, Ger. *Stände*) is the name commonly given to an assembly of estates (*assemblée des états*, *Ständeversammlung*). When such an assembly is not merely local or provincial it is called the estates-general or states-general (*états généraux*), *e.g.* in France the assembly of the deputies of the three estates of the realm as distinct from the provincial estates which met periodically in the so-called *pays d’états*.

For further details about the estates in England and elsewhere see W. Stubbs, *Constitutional History*, vol. ii. (1896); H. Hallam, *The Middle Ages* (1855); F.W. Maitland, *Constitutional History of England* (1908); A. Luchaire, *Histoire des institutions monarchiques de la France* (1883-1885); G. Waitz, *Deutsche Verfassungsgeschichte* (Kiel, 1865-1878); and A.S. Rait, *The Scottish Parliament* (1901). See also REPRESENTATION.

1 In Scotland the three estates were the prelates, the tenants-in-chief and the burgesses, the third estate joining the others for the first time about the beginning of the 14th century. In 1428 commissioners of shires, men elected by the minor tenants-in-chief, were ordered to appear in parliament; the greater tenants-in-chief then coalesced with the prelates and the three estates were the lords, clerical and lay, the commissioners of shires and the burgesses. From 1640 to 1660 parliament was reorganized, the prelates being excluded, but at the Restoration the old order was re-established. The Scottish parliament was accustomed to depute much of its work to a committee, composed of members from each of the three orders, and the committee of the estates was very prominent during the struggle between Charles I. and his people.

2 These diets are, wherever they still exist, survivals of the “parliaments” of separate territorial units.

ESTATE AND HOUSE AGENTS. A person exercising the calling of a house agent in England is required, under a penalty of £20, to take out yearly a licence upon which £2 is charged as a duty of excise, unless he is licensed as an auctioneer or appraiser, or is an agent employed in the management of landed estates, or a solicitor or conveyancer who has taken out his annual certificate as such. In this connexion a person is deemed to be a house agent if he advertises for sale or for letting, or in any way negotiates for the selling or letting of any furnished house or part of any furnished house (any storey or flat rated and let as a separate tenement being for this purpose a house); subject, however, to the qualification that no one is to be deemed to be a house agent by reason of his letting, or offering to let, or in any way negotiating for the letting of, any house the annual rent or value of which does not exceed £25.

A house agent who is merely instructed to act in the usual way of his calling has no authority to

bind his employer by a contract. His business is to endeavour to find a person willing to become a purchaser or tenant and then to communicate his offer to the owner. Unless express authority is given to the agent to sell or let, and for that purpose to enter into a binding contract, the principal reserves his right to accept or refuse the offer. As a rule, a house or estate agent has no authority to receive payment on behalf of the principal. Where he is employed to procure a tenant, he must use reasonable diligence to ascertain that the person to whom the property is let through his agency is fit to be a tenant. He does not, however, in any way guarantee the payment of the rent. A house agent may not, for or in expectation of payment, prepare any deed relating to the sale or letting of real or personal estate. There is, however, no similar prohibition as to agreements not under seal, and it is a common practice for house agents to charge for the preparation of them.

House agents are usually remunerated by way of commission. The scale adopted by the Institute of Estate and House Agents embodies the rates usually charged. In the absence of express provision upon the subject between the principal and the agent, commission is payable only when the latter has found a purchaser or tenant. If, however, he had found a person willing to buy or take property upon the terms upon which the principal intimated to him his willingness to sell or let it, the principal will be liable to pay the amount of the commission, even though in fact he refuses or is unable to sell or let it. Where the agent can show that he has brought about a sale or tenancy he will be entitled to the commission notwithstanding the fact that another agent has been paid, or has recovered in an action, commission in respect of the same sale or tenancy. The agent's authority may be revoked at any time; but, where he has already performed the service for which he was employed, the principal cannot defeat his right to be paid the amount of the commission by subsequently revoking his authority. If the agent is unsuccessful in finding a purchaser or tenant, as the case may be, he will not, as a rule, have any right to remuneration for his efforts in the matter.

Most auctioneers, in addition to holding auctions, carry on the business of house and estate agency. The number of licences issued to house agents and appraisers in England for the year ended 31st March 1899 was 4429, and for the year ended 31st March 1909, 4618. The number of licences issued to auctioneers in England for the corresponding periods was 6389 and 6543 respectively.

(H. Ha.)

ESTATE DUTY. For purposes of the national revenue in the United Kingdom, the Finance Act 1894 imposed on all property passing by death after the 1st of August 1894 a duty called estate duty, in lieu of certain other duties previously payable. The objects of the act were—(1) simplification of the death duties and equalization as between real and personal property, and (2) aggregation of all the property passing on a death, and taxation at rates graduated according to the value of the whole. Before the act a duty (probate duty) was taken on the free personal property of deceased persons in the hands of the executor or administrator, without regard to the subsequent distribution. The legacy and succession duties were levied on distribution of the property passing on the death, from the persons taking any property under the will or intestacy of the deceased, or under settlement, or by devolution of title on his death. These two latter duties were mutually exclusive, and together covered practically all property passing by death. They were levied at rates graduated according to consanguinity. In 1888 an attempt was made to equalize the rates of the death duties as between property which paid the probate and legacy duties, and property which paid succession duty only. But the Finance Act 1894 replaced the probate duty by a duty extending to all property real or personal passing on or by reference to death, whether by disposition of the deceased or not, without regard to its tenure or destination. The Finance Acts of 1907 and 1909-1910 increased the scale of duties laid down in 1894.

For this purpose all property passing on a death is aggregated to form one estate, on the capital value of which the duty is charged, at rates graduated from 1 to 15% according to the aggregate value. Besides the property of which the deceased was competent to dispose at his death, the aggregated estate includes property in which he had an interest ceasing on his death, from the cesser of which a benefit accrues, or which was disposed of by him within twelve months of death, or at any time, with reservation of an interest to himself. The extent to which property is deemed to pass on the cesser of a limited interest is measured by the proportion of the income to which the interest extended, without regard to the tenure of the deceased or his successor. Property may therefore be included in the aggregate estate at its capital value owing to the passing of a life-interest only, the property being settled so that the absolute ownership does not pass at all. But when the duty has once been paid on property passing under a settlement, the property does not again become chargeable until it passes on the death of a person who is or has been competent to dispose of it. To compensate for this advantage, when property passing under a settlement made after the act pays the estate duty, a further duty of 2% (settlement estate duty) is taken, except where the only subsequent life-interest is that of the wife or husband of the deceased.

The rate of duty being fixed according to the aggregate capital value of the whole estate, the charge is distributed according to the different modes of disposition of the property comprised in the estate. The duty on the personalty which passes to the executor as such is paid by him, as the probate

duty was, and comes out of the general estate. For the other property passing, trustees, or any person to whom it passes for a beneficial interest in possession, are made accountable, and are required to bring in an account of the property and pay the duty. The duty is a first charge on such property, and, when it is paid by a person having a life-interest only, he may charge the *corpus* of the property with it. The duty on real property included in an account is payable by eight yearly or sixteen half-yearly instalments, becoming due twelve months after the death, and bearing interest at 3% from that date. On other property, except in a few special cases, the duty bears interest at 3% from the date of the death. When the estate duty has been paid no further duty is chargeable on property comprised in the estate which passes to lineal relations of the deceased. But on property passing to collaterals or strangers legacy or succession duty, as the case may be, is payable by the devisees or successors, at a rate (which is the same whichever duty be payable) fixed according to consanguinity.

For a detailed account of the provisions of the act of 1894 and subsequent amending acts, and of the practical working of the duty, reference is made to Austen-Cartmell, *Finance Acts* (1894-1907); Hanson, *Death Duties* (London, 1904); Soward, *Handbook to the Estate Duty* (4th ed., London, 1900); and to the reports of the commissioners of Inland Revenue for 1894-1895 and subsequent years.

ESTCOURT, RICHARD (1668-1712), English actor, began by playing comedy parts in Dublin. His first London appearance was in 1704 as Dominick, in Dryden's *Spanish Friar*, and he continued to take important parts at Drury Lane, being the original Pounce in Steele's *Tender Husband* (1705), Sergeant Kite in Farquhar's *Recruiting Officer*, and Sir Francis Gripe in Mrs Centlivre's *Busybody*. He was an excellent mimic and a great favourite socially. Estcourt wrote a comedy, *The Fair Example, or the Modish Citizen* (1703), and *Prunella* (1704), an interlude.

ESTE, one of the oldest of the former reigning houses of Italy. It is in all probability of Lombard origin, and descended, according to Muratori, from the princes who governed in Tuscany in Carolingian times. The lordship of the town of Este was first acquired by Alberto Azzo II., who also bore the title of marquis of Italy[1] (d. *c.* 1097); he married Kunitza or Kunegonda, sister of Welf or Guelph III., duke of Carinthia. Welf died without issue, and was succeeded by Welf IV., son of Kunitza, who married a daughter of Otto II., duke of Bavaria, and who obtained the duchy of Bavaria in 1070. Through him the house of Este became connected with the princely houses of Brunswick and Hanover, from which the sovereigns of England are descended. The Italian titles and estates were inherited by Folco I. (1060-1135), son of Alberto Azzo by his second wife Gersende, daughter of Herbert I., count of Maine.[2] The house of Este played a great part in the history of medieval and Renaissance Italy, and it first comes to the front in the wars between the Guelphs and Ghibellines; as leaders of the former party its princes received at different times Ferrara, Modena, Reggio and other fiefs and territories.

Obizzo I., son of Folco, was the first to bear the title of marquis of Este. He entered into the Guelphic league against the emperor Frederick I., and was comprehended in the treaty of Venice of 1177 by which municipal *podestàs* (foreigners chosen as heads of cities to administer justice impartially) were instituted. He was elected podestà of Padua in 1178, and in 1184 he was reconciled with Frederick, who created him marquis of Genoa and Milan, a dignity somewhat similar to that of imperial vicar. By the marriage of his son Azzo to the heiress of the Marchesella family (the story that she was carried off to prevent her marrying an enemy of the Este is a pure legend), he came to acquire great influence in Ferrara, although he was opposed by the hardly less powerful house of Torelli.

Obizzo died in 1194 and Azzo V. having predeceased him, the marquisate devolved on his grandson Azzo VI. (1170-1212), who became head of the Guelph party, and to him the people of Ferrara sacrificed their liberty by making him their first lord (1208). But during his lifetime civil war raged in the city, between the Este and the Torelli, each party being driven out again and again. Azzo (also called Azzolino) died in 1212 and was succeeded by Aldobrandino I., who in 1213 concluded a treaty with Salinguerra Torelli, the head of that house, to divide the government of the city between them. On his death in 1215 he was succeeded by his brother Azzo VII. (1205-1264), surnamed Novello, but Salinguerra Torelli usurped all power in Ferrara and expelled Azzo (1222). In 1240 Pope Gregory IX. determined on another war against the emperor Frederick II., but deemed it wise to begin by crushing the chief Ghibelline houses. Thus Azzo found himself in league with the pope and various Guelph cities in his attempt to regain Ferrara. That town underwent a four months' siege, and was at last compelled to surrender; Salinguerra was sent to Venice as a prisoner, and Azzo ruled in Ferrara once more. The Ghibelline party was annihilated, but the city enjoyed peace and happiness within,

although her citizens took part in the wars raging outside. The Guelph cause triumphed, Frederick being defeated several times, and after his death Azzo helped in crushing the terrible Eccelino da Romano (*q.v.*) who upheld the imperial cause, at the battle of Cassano (1259). He died in 1264 and was succeeded by Obizzo II. (1240-1293) his grandson, who in 1288 received the lordship of Modena, and that of Reggio in 1289. He was a capable but cruel ruler, and while professing devotion to the Guelph cause, did homage to the German king Rudolph I. when he descended into Italy.

Obizzo II. died in 1293 and was succeeded by his son Azzo VIII., but the latter's brothers, Aldobrandino and Francesco, who were to have shared in the government, were expelled and became his bitter enemies. The misgovernment of Azzo led to the revolt of Reggio and Modena, which shook off his yoke. Enemies arose on all sides, and he spent his last years in perpetual fighting. He died in 1308, and having no legitimate children, his brothers, his natural son Fresco, and others disputed the succession. A papal legate was appointed, and though the Este returned they were placed under pontifical tutelage.

The history of the house now becomes involved and of little interest until we come to Nicholas III. (1384-1441), who exercised sway over Ferrara, Modena, Parma and Reggio, waged many wars, was made general of the army of the Church, and in his later years governor of Milan, where he died, not without suspicion of poison. To him succeeded Lionello (1407-1450), a wise and virtuous ruler and a patron of literature and art; then Borso (1413-1471), his brother, who was created duke of Modena and Reggio by the emperor Frederick III., and duke of Ferrara by the pope. In spite of the wars by which all Italy was torn, Ferrara enjoyed a period of peace and prosperity under Borso; he patronized literature, established a printing-press at Ferrara, surrounded himself with learned men, and his court was of unparalleled splendour. He also protected industry and commerce, and ruled with great wisdom. His brother Ercole I. (1431-1505), who succeeded him in 1471, was less fortunate, and had to engage in a war with Venice, owing to a dispute about the salt monopoly, with the result that by the peace of 1484 he was forced to cede the district of Polesine to the republic. But the last years of his life were peaceful and prosperous, so that afterwards men looked back to the days of Ercole I. as to a golden age; his capital was noted both for its luxury and as the resort of men eminent in literature and art. Boiardo the poet was his minister, and Ariosto obtained his patronage.

Ercole's daughter Beatrice d'Este (1475-1497), duchess of Milan, one of the most beautiful and accomplished princesses of the Italian Renaissance, was bethrothed at the age of five to Lodovico Sforza (known as *il Moro*), duke of Bari, regent and afterwards duke of Milan, and was married to him in January 1491. She had been carefully educated, and availed herself of her position as mistress of one of the most splendid courts of Italy to surround herself with learned men, poets and artists, such as Niccolò da Correggio, Bernardo Castiglione, Bramante, Leonardo da Vinci and many others. In 1492 she visited Venice as ambassador for her husband in his political schemes, which consisted chiefly in a desire to be recognized as duke of Milan. On the death of Gian Galeazzo Sforza, Lodovico's usurpation was legalized, and after the battle of Fornovo (1495) both he and his wife took part in the peace congress of Vercelli between Charles VIII. of France and the Italian princes, at which Beatrice showed great political ability. But her brilliant career was cut short by death through childbirth, on the 3rd of January 1497. She belongs to the best class of Renaissance women, and was one of the culture influences of the age; to her patronage and good taste are due to a great extent the splendour of the Castello of Milan, of the Certosa of Pavia and of many other famous buildings in Lombardy.

Her sister Isabella d'Este (1474-1539), marchioness of Mantua, was carefully educated both in letters and in the arts like Beatrice, and was married when barely sixteen to Francesco Gonzaga, marquis of Mantua (1490). She showed great diplomatic and political skill, especially in her negotiations with Cesare Borgia (*q.v.*), who had dispossessed Guidobaldo da Montefeltro, duke of Urbino, the husband of her sister-in-law and intimate friend Elisabetta Gonzaga (1502). She received the deposed duke and duchess, as well as other princes in the same condition, at her court of Mantua, which was one of the most brilliant in Italy, and like her sister she gathered together many eminent men of letters and artists, Raphael, Andrea Mantegna and Giulio Romano being among those whom she employed. Both she and her husband were greatly influenced by Baldassare Castiglione (1478-1529), author of *Il Cortigiano*, and it was at his suggestion that Giulio Romano was summoned to Mantua to enlarge the Castello and other buildings. Isabella was "undoubtedly, among all the princesses of the 15th and 16th centuries, the one who most strikingly and perfectly personified the aspirations of the Renaissance" (Eugène Müntz); but her character was less attractive than that of her sister, and in her love of collecting works of art she showed a somewhat grasping nature, being ever anxious to cut down the prices of the artists who worked for her.

To Ercole I. succeeded his son Alphonso I. (1486-1534), the husband of Lucrezia Borgia (*q.v.*), daughter of Pope Alexander VI. During nearly the whole of his reign he was engaged in the Italian wars, but by his diplomatic skill and his military ability he was for many years almost always successful. He was gifted with great mechanical skill, and his artillery was of world-wide reputation. On the formation of the league of Cambrai against Venice in 1508, he was appointed to the supreme command of the papal troops by Julius II.; but after the Venetians had sustained a number of reverses they made peace with the pope and joined him against the French. Alphonso was invited to co-operate in the new combination, and on his refusal war was declared against him; but although he began by losing Modena and Reggio, he subsequently inflicted several defeats on the papal troops. He fought on the side of the French at the battle of Ravenna (1512), from which, although victorious,

they derived no advantage. Soon afterwards they retired from Italy, and Alphonso, finding himself abandoned, tried to make his peace with the pope, through the mediation of Fabrizio Colonna. He went to Rome for the purpose and received absolution, but on discovering that Julius meant to detain him a prisoner, he escaped in disguise, and the pope's death in 1513 gave him a brief respite. But Leo X. proved equally bent on the destruction of the house of Este, when he too was cut off by death. Alphonso availed himself of the troubles of the papacy during the reign of the equally hostile Clement VII. to recapture Reggio (1523) and Modena (1527), and was confirmed in his possession of them by the emperor Charles V., in spite of Clement's opposition.

He died in 1534, and was succeeded by his son Ercole II. (1508-1559), who married Renée, daughter of Louis XII. of France, a princess of Protestant proclivities and a friend of Calvin. On joining the league of France and the papacy against Spain, Ercole was appointed lieutenant-general of the French army in Italy. The war was prosecuted, however, with little vigour, and peace was made with Spain in 1558. The duke and his brother, Cardinal Ippolito the Younger, were patrons of literature and art, and the latter built the magnificent Villa d' Este at Tivoli. He was succeeded by Alphonso II. (1533-1597), remembered for his patronage of Tasso, whom he afterwards imprisoned. He reorganized the army, enriched the public library, encouraged agriculture, but was extravagant and dissipated. With him the main branch of the family came to an end, and although at his death he bequeathed the duchy to his cousin Cesare (1533-1628), Pope Clement VIII., renewing the Church's hostility to the house of Este, declared that prince to be of illegitimate birth (a doubtful contention), and by a treaty with Lucrezia, Alphonso's sister, Ferrara was made over to the Holy See. Cesare held Modena and Reggio, but with him the Estensi cease to play an important part in Italian politics. For two centuries this dynasty had been one of the greatest powers in Italy, and its court was perhaps the most splendid in Europe, both as regards pomp and luxury and on account of the eminent artists, poets and scholars which it attracted.

The subsequent heads of the family were: Alphonso III., who retired to a monastery in 1629 and died in 1644; Francis I. (1610-1658), who commanded the French army in Italy in 1647; Alphonso IV. (1634-1662), the father of Mary Beatrice, the queen of James II. of England, who fought in the French army during the Spanish War, and founded the picture gallery of Modena; Francis II. (1660-1694), who originated the Este library, also at Modena, and founded the university; Rinaldo (1655-1737), through whose marriage with Charlotte Felicitas of Brunswick-Lüneburg the long-separated branches of the house of Este were reunited; Francis III. (1698-1780), who married the daughter of the regent Philip of Orleans. Francis III. wished to remain neutral during the war between Spain and Austria (1740), but the imperialists having occupied and devastated his duchy, he took the Spanish side and was appointed *generalissimo* of the Spanish army in Italy. He was re-established in his possessions by the treaty of Aix-la-Chapelle (1748), and on being reconciled with the empress Maria Theresa, he received from her the title of governor of Lombardy in 1754. With his son Ercole III. Rinaldo (1727-1803), who at the peace of Campoformio lost his duchy, the male line of the Estensi came to an end. His only daughter, Marie Beatrice (d. 1829), was married to the archduke Ferdinand, third son of the emperor Francis I. Ferdinand was created duke of Breisgau in 1803, and at his death in 1806 he was succeeded by his son Francis IV. (*q.v.*), to whom the duchy of Modena was given at the treaty of Vienna in 1814. He died in 1846 and was succeeded by Francis V. (*q.v.*), who lost his possessions by the events of 1859. With his death in 1875 the title and estates passed to the archduke Francis Ferdinand, heir to the Austro-Hungarian throne. The children of Lady Augusta Murray, daughter of the earl of Dunmore, by her marriage with Augustus Frederick, duke of Sussex, sixth son of George III. of Great Britain, assumed the old name of d' Este, and claimed recognition as members of the royal family; but as the marriage was in violation of the royal marriages act of 1773, it was declared invalid, and their claims were set aside.

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(L. V.*)

1 *i.e.* Margrave of the Empire (*marchio Sancti Imperii*) in Italy. (See MARQUESS.)

2 Another son of Azzo and Gersende became count of Maine as Hugh III. (d. 1131).

ESTE (anc. *Ateste, q.v.*), a town and episcopal see of Venetia, Italy, in the province of Padua, 20 m. S.S.W. of it by rail. Pop. (1901) 8671 (town); 10,779 (commune). It lies 49 ft. above sea-level below the southern slopes of the Euganean Hills. The external walls of the castle still rise above the town on the N., but the interior is now occupied by the cattle-market. A fragment of the once enormous Palazzo Mocenigo, of the 16th century, is now occupied by the important archaeological museum (see Ateste). The cathedral was erected in 1690-1720, on the site of an older building destroyed by an earthquake in 1688. S. Martino is a church in the Lombard Romanesque style. The archives in the Palazzo Comunale are important.

After the Roman period the history of Este is a blank until the Lombard period, in which it was dependent on Monselice. In the 10th century the family of Este (see above) established itself in the castle above the town. At the end of the 13th century Padua, which had already captured Este more than once, became definitely mistress of it. When the Carrara family succumbed in 1405, Este voluntarily surrendered to Venice and was allowed its independence, under a podestà; and thenceforth it followed the fortunes of Venetia.

ESTÉBANEZ CALDERÓN, SERAFÍN (1799-1867), a Spanish author, best known by the pseudonym of “El Solitario,” was born at Málaga on the 27th of December 1799. His first literary effort was *El Listón verde*, a poem signed “Safinio” and written to celebrate the revolution of 1820. He was called to the bar, and settled for some time at Madrid, where he published a volume of verses in 1831 under the assumed name of “El Solitario.” He obtained an exaggerated reputation as an Arabic scholar, and played a minor part in the political movements of his time. He died at Madrid on the 5th of February 1867. His most interesting work, *Escenas andaluzas* (1847), is in a curiously affected style, the vocabulary being partly archaic and partly provincial; but, despite its eccentric mannerisms, it is a vivid record of picturesque scenes and local customs. Estébanez Calderón is also the author of an unfinished history, *De la conquista y pérdida de Portugal* (1883), issued posthumously under the editorship of his nephew, Antonio Cánovas del Castillo.

ESTELLA, a town of northern Spain, in the province of Navarre, on the left bank of the river Ega, 15 m. W.S.W. of Pamplona. Pop. (1900) 5736. Estella, which occupies the site of a Roman town of uncertain name, contains several monasteries and churches, a medieval citadel, and a college which was formerly a university. Its principal industries are the manufacture of woollen and linen fabrics and brandy-making; and it has a considerable trade in fruit, wine and cattle. Estella commands several defiles on the roads from Castile and Aragon, and on that account occupies a position of considerable strategic importance. It was long the headquarters of Don Carlos, who was proclaimed king here in 1833. In 1873 it was the chief stronghold of the Carlists, and in 1874, when driven from other places, they succeeded in retiring to Estella. On the 16th of February 1876 the Carlists in the town surrendered unconditionally. For an account of the Carlist rising see Spain: *History*.

ESTERHÁZY OF GALÁNTHA, a noble Magyar family. Its origin has been traced, not without some uncertainty, to Salamon of Estoras, whose sons Péter and Illyés divided their patrimony in 1238. Péter founded the family of Zerházy, and Illyés that of Illyesházy, which became extinct in the male line in 1838. The first member of the family to emerge definitely into history was Ferencz Zerházy (1563-1594), vice lord-lieutenant of the county of Pressburg, who took the name of Esterházy when he was created *Freiherr* of Galántha, an estate acquired by the family in 1421. His eldest son, Dániel (d. 1654), founded the house of Czesznek, the third, Pál (d. 1641), the line of Zólyom (Altsohl), and the fourth, Miklós, that branch of the family which occupies the most considerable place in Hungarian history, that of Fraknó or Forchtenstein.

This Miklós [Nicholas] Esterházy of Galántha (1582-1645) was born at Galántha on the 8th of April 1582. His parents were Protestants, and he himself, at first, followed the Protestant persuasion; but he subsequently went over to Catholicism and, along with Cardinal Pázmány, his most serious rival at court, became a pillar of Catholicism, both religiously and politically, and a worthy opponent of the two great Protestant champions of the period, Gabriel Bethlen and George I. Rákóczy. In 1611 he married Orsolyá, the widow of the wealthy Ferencz Mágocsy, thus coming into possession of her gigantic estates, and in 1622 he acquired Fraknó. Matthias II. made him a baron (1613), count of

Beregh (1617), and lord-lieutenant of the county of Zólyom and *magister curiae regiae* (1618). At the coronation of Ferdinand II., when he officiated as grand-standard-bearer, he received the order of the Golden Fleece and fresh donations. At the diet of Sopron, 1625, he was elected palatine of Hungary. As a diplomatist he powerfully contributed to bring about the peace of Nikolsburg (1622) and the peace of Linz (1645) (see HUNGARY: *History*). His political ideal was the consolidation of the Habsburg dynasty as a means towards freeing Hungary from the Turkish yoke. He himself, on one occasion (1623), defeated the Turks on the banks of the Nyitra; but anything like sustained operations against them was then impossible. He was also one of the most eminent writers of his day. He died at Nagy-Heflán on the 11th of September 1645, leaving five sons.

See *Works of Nicholas Esterházy*, with a biography by Ferencz Toldi (Hung.) (Pest, 1852); *Nicholas Count Esterházy, Palatine of Hungary* (a biography, Hung.) (Pest, 1863-1870).

His third son PÁL [Paul] (1635-1713), prince palatine, founded the princely branch of the family of Esterházy. He was born at Kis Marton (Eisenstadt) on the 7th of September 1635. In 1663 he fought, along with Miklós Zrinyi, against the Turks, and distinguished himself under Montecuculi. In 1667 he was appointed commander-in-chief in south Hungary, where he defeated the malcontents at Leutschau and György. In 1681 he was elected palatine. In 1683 he participated in the deliverance of Vienna from the Turks, and entered Buda in 1686 at the head of 20,000 men. Thoroughly reactionary, and absolutely devoted to the Habsburgs, he contributed more than any one else to the curtailing of the privileges of the Magyar gentry in 1687, when he was created a prince of the Empire, with (in 1712) succession to the first-born of his house. His “aulic tendencies” made him so unpopular that his offer of mediation between the Rákóczy insurgents and the government was rejected by the Hungarian diet, and the negotiations, which led to the peace of Szatmár (see HUNGARY: *History*), were entrusted to János Pállfy. He died on the 26th of March 1713. He loved the arts and sciences, wrote several religious works, and was one of the chief compilers of the *Trophaeum Domus Inclytae Estoratianae*.

See Lajos Merényi, *Prince Paul Esterházy* (Hung.) (Budapest, 1895).

Prince PÁL ANTAL, grandson of the prince palatine Pál, was a distinguished soldier, who rose to the rank of field-marshal in 1758. On his death in 1762 he was succeeded by his brother.

Prince MIKLÓS JÓZSEF [Nicholas Joseph] (1714-1790), also a brilliant soldier, is perhaps best remembered as a patron of the fine arts. For his services in command of an infantry brigade at Kolin (1757) he was specially mentioned by Count Daun, and became one of the original members of the order of Maria Theresa. In 1762 he was appointed captain of Maria Theresa’s Hungarian body-guard, in 1764 *Feldzeugmeister*, and in 1768 field marshal. His other honours included the Golden Fleece and the grade of commander in the order of Maria Theresa. Joseph II. conferred the princely title, which had previously been limited to the eldest-born of the house, on all his descendants, male and female. Esterházy died in Vienna on the 28th of September 1790. He rebuilt in the Renaissance style Schloss Esterházy, the splendour of which won for it the name of the Hungarian Versailles. Haydn was for thirty years conductor of his private orchestra and general musical director, and many of his compositions were written for the private theatre and the concerts of this prince.

His grandson, Prince MIKLÓS [Nicholas] (1765-1833) was born on the 12th of December 1765. He began life as an officer in the guards, subsequently making the grand tour, which first awakened his deep interest in art. He quitted the army for diplomacy after reaching the rank of *Feldzeugmeister*, and was employed as extraordinary ambassador, on special occasions, when he displayed a magnificence extraordinary even for the Esterházys. He made at Vienna an important collection of paintings and engravings, which came into the possession of the Hungarian Academy at Budapest in 1865. At his summer palace of Kis Marton (Eisenstadt) he erected a monument to Haydn. His immense expenditure on building and the arts involved the family in financial difficulties for two generations. When the French invaded Austria in 1797, he raised a regiment of 1000 men at his own expense. In 1809, when Napoleon invited the Magyars to elect a new king to replace the Habsburgs, overtures were made to Prince Nicholas, who refused the honour and, further, raised a regiment of volunteers in defence of Austrian interests. He died at Como on the 24th of November 1833.

His son, Prince PÁL ANTAL [Paul Anthony] (1786-1866), entered the diplomatic service. In 1806 he was secretary of the embassy in London, and in 1807 worked with Prince Metternich in the same capacity in Paris. In 1810 he was accredited to the court of Dresden, where he tried in vain to detach Saxony from Napoleon, and in 1814 he accompanied his father on a secret mission to Rome. He took a leading part in all the diplomatic negotiations consequent upon the wars of 1813-1815, especially at the congress of Châtillon, and on the conclusion of peace was, at the express desire of the prince regent, sent as ambassador to London. In 1824 he represented Austria as ambassador extraordinary at the coronation of Charles X., and was the premier Austrian commissioner at the London conferences of 1830-1836. In 1842 he quitted diplomacy for politics and attached himself to “the free-principles party.” He was minister for foreign affairs in the first responsible Hungarian ministry (1848), but resigned his post in September because he could see no way of reconciling the court with the nation. The last years of his life were spent in comparative poverty and isolation, as even the Esterházy-Forchtenstein estates were unequal to the burden of supporting his fabulous extravagance and had to be placed in the hands of curators.

The cadet branch of the house of Fraknó, the members of which bear the title of count, was divided

into three lines by the sons of Ferencz Esterházy (1641-1683).

The eldest of these, Count Antal (1676-1722), distinguished himself in the war against Rákóczy in 1703, but changed sides in 1704 and commanded the left wing of the Kuruczis at the engagements of Nagyszombat (1704) and Vereskö (1705). In 1706 he defeated the imperialist general Guido Stahremberg and penetrated to the walls of Vienna. Still more successful were his operations in the campaign of 1708, when he ravaged Styria, twice invaded Austria, and again threatened Vienna, on which occasion the emperor Joseph narrowly escaped falling into his hands. In 1709 he was routed by the superior forces of General Sigbert Heister at Palota, but brought off the remainder of his arms very skilfully. In 1710 he joined Rákóczy in Poland and accompanied him to France and Turkey. He died in exile at Rodosto on the shores of the Black Sea. His son Bálint József [Valentine Joseph], by Anna Maria Nigrelli, entered the French army, and was the founder of the Hallewyll, or French, branch of the family, which became extinct in the male line in 1876 with Count Ladislas.

See *Count Esterházy's Campaign Diary* (Hung.), ed. by K. Thaly (Pest, 1901).

Count Bálint Miklós (1740-1805), son of Bálint József, was an enthusiastic partisan of the duc de Choiseul, on whose dismissal, in 1764, he resigned the command of the French regiment of which he was the colonel. It was Esterházy who conveyed to Marie Antoinette the portrait of Louis XVI. on the occasion of their betrothal, and the close relations he maintained with her after her marriage were more than once the occasion of remonstrance on the part of Maria Theresa, who never seems to have forgotten that he was the grandson of a rebel. At the French court he stood in high favour with the comte d'Artois. He was raised to the rank of maréchal de camp, and made inspector of troops in the French service in 1780. At the outbreak of the French Revolution, he was stationed at Valenciennes, where he contrived for a time to keep order, and facilitated the escape of the French *emigrés* by way of Namur; but, in 1790, he hastened back to Paris to assist the king. At the urgent entreaty of the comte d'Artois in 1791 he quitted Paris for Coblenz, accompanied Artois to Vienna, and was sent to the court of St Petersburg the same year to enlist the sympathies of Catherine II. for the Bourbons. He received an estate from Catherine II., and although the gift was rescinded by Paul I., another was eventually granted him. He died at Grodek in Volhynia on the 23rd of July 1805.

See *Mémoires*, ed. by E. Daudet (Fr.) (Paris, 1905), and *Lettres* (Paris, 1906).

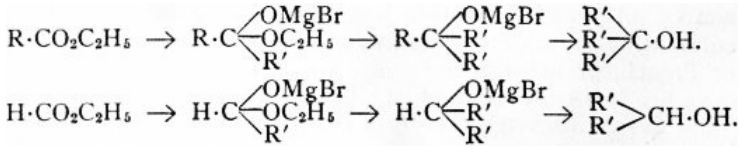
Two other sons of Count Ferencz (d. 1685), Ferencz and József, founded the houses of Dotis and Cseklész (Landschütz) respectively. Of their descendants, Count Móricz (1807-1890) of Dotis, Austrian ambassador in Rome until 1856, became in 1861 a member of the ministry formed by Anton Schmerling and in 1865 joined the clerical cabinet of Richard Belcredi. His bitter hostility to Prussia helped to force the government of Vienna into the war of 1866. His official career closed in 1866, but he remained one of the leaders of the clerical party.

See also Count János Esterházy, *Description of the Esterházy Family* (Hung., Budapest, 1901).

(R. N. B.)

ESTERS, in organic chemistry, compounds formed by the condensation of an alcohol and an acid, with elimination of water; they may also be considered as derivatives of alcohols, in which the hydroxylic hydrogen has been replaced by an acid radical, or as acids in which the hydrogen of the carboxyl group has been replaced by an alkyl or aryl group. In the case of the polybasic acids, all the hydrogen atoms can be replaced in this way, and the compounds formed are known as "neutral esters." If, however, some of the hydrogen of the acid remain undisplaced, then "acid esters" result. These acid esters retain some of the characteristic properties of the acids, forming, for example, salts, with basic oxides. Esters may be prepared by heating the silver salt of an acid with an alkyl iodide; by heating the alcohols or alcoholates with an acid chloride; by distilling the anhydrous sodium salt of an acid with a mixture of the alcohol and concentrated sulphuric acid; or by heating for some hours on the water bath, a mixture of an acid and an alcohol, with a small quantity of hydrochloric or sulphuric acids (E. Fischer and A. Speier, *Ber.*, 1896, 28, p. 3252).

The esters of the aliphatic and aromatic acids are colourless neutral liquids, which are generally insoluble in water, but readily dissolve in alcohol and ether. Many possess a fragrant odour and are prepared in large quantities for use as artificial fruit essences. They hydrolyse readily when boiled with solutions of caustic alkalies or mineral acids, yielding the constituent acid and alcohol. When heated with ammonia, they yield acid amides (*q.v.*). They form unstable addition products with sodium ethylate or methylate. With the Grignard reagent, they form addition compounds which on the addition of water yield tertiary alcohols, except in the case of ethyl formate, where a secondary alcohol is obtained.



N. Menschutkin (*Ber.*, 1882, 15, p. 1445; *Ann.*, 1879, 195, p. 334) examined the rate of esterification of many acids with alcohols. It was found that the normal primary alcohols were all esterified at about the same rate, the secondary alcohols more slowly than the primary, and the tertiary alcohols still more slowly. The investigation also showed that the nature of the acid used affected the result, for in an homologous series of acids it was found that as the molecule of the acid became more complex, the rate of esterification became less. The formation of an ester by the interaction of an acid with an alcohol is a "reversible" or "balanced" action, for as M. Berthelot and L. Péan de St Gilles (*Ann. Chim. Phys.*, 1862 (3), 65, p. 385 et seq.) have shown in the case of the formation of ethyl acetate from ethyl alcohol and acetic acid, a point of equilibrium is reached, beyond which the reacting system cannot pass, unless the system be disturbed in some way by the removal of one of the products of the reaction. V. Meyer (*Ber.*, 1894, 27, p. 510 et seq.) showed that in benzenoid compounds ortho-substituents exert a great hindering effect on the esterification of alcohols by acids in the presence of hydrochloric acid, this hindering being particularly marked when two substituents are present in the ortho positions to the carboxyl group. In such a case the ester is best prepared by the action of an alkyl halide on the silver salt of the acid, and when once prepared, can only be hydrolysed with great difficulty.

Ethyl formate, $H{\cdot}CO_2C_2H_5$, boils at 55° C. and has been used in the artificial preparation of rum. Ethyl acetate (acetic ether), $CH_3{\cdot}CO_2C_2H_5$, boils at 75° C. Isoamylisovalerate, $C_4H_9{\cdot}CO_2C_5H_{11}$, boils at 196° C. and has an odour of apples. Ethyl butyrate, $C_3H_7{\cdot}CO_2C_2H_5$, boils at 121° C. and has an odour of pineapple. The fats (*q.v.*) and waxes (*q.v.*) are the esters of the higher fatty acids and alcohols. The esters of the higher fatty acids, when distilled under atmospheric pressure, are decomposed, and yield an olefine and a fatty acid.

Esters of the mineral acids are also known and may be prepared by the ordinary methods as given above. The neutral esters are as a rule insoluble in water and distil unchanged; on the other hand, the acid esters are generally soluble in water, are non-volatile, and form salts with bases. *Ethyl hydrogen sulphate* (sulphovinic acid), $C_2H_5{\cdot}HSO_4$, is obtained by the action of concentrated sulphuric acid on alcohol. The ester is separated from the solution by means of its barium salt, and the salt decomposed by the addition of the calculated amount of sulphuric acid. It is a colourless oily liquid of strongly acid reaction; its aqueous solution decomposes on standing and on heating it forms diethyl sulphate and sulphuric acid. *Dimethyl sulphate*, $(CH_3)_2SO_4$, is a colourless liquid which boils at 187°-188° C., with partial decomposition. It is used as a methylating agent (F. Ullmann). Great care should be taken in using dimethyl and diethyl sulphates, as the respiratory organs are affected by the vapours, leading to severe attacks of pneumonia. *Ethyl nitrate*, $C_2H_5{\cdot}ONO_2$, is a colourless liquid which boils at 86.3° C. It is prepared by the action of nitric acid on ethyl alcohol (some urea being added to the nitric acid, in order to destroy any nitrous acid that might be produced in secondary reactions and which, if not removed, would cause explosive decomposition of the ethyl nitrate). It burns with a white flame and is soluble in water. When heated with ammonia it yields ethylamine nitrate, and when reduced with tin and hydrochloric acid it forms hydroxylamine (*q.v.*) (W.C. Lossen). *Ethyl nitrite*, $C_2H_5{\cdot}ONO$, is a liquid which boils at 18° C.; the crude product obtained by distilling a mixture of alcohol, sulphuric and nitric acids and copper turnings is used in medicine under the name of "sweet spirits of nitre." *Amyl nitrite*, $C_5H_{11}{\cdot}ONO$, boils at 96° C. and is used in the preparation of the anhydrous diazonium salts (E. Knoevenagel, *Ber.*, 1890, 23, p. 2094). It is also used in medicine.

ESTHER. The *Book of Esther*, in the Bible, relates how a Jewish maiden, Esther, cousin and foster-daughter of Mordecai, was made his queen by the Persian king Ahasuerus (Xerxes) after he had divorced Vashti; next, how Esther and Mordecai frustrated Haman's endeavour to extirpate the Jews; how Haman, the grand-vizier, fell, and Mordecai succeeded him; how Esther obtained the king's permission for the Jews to destroy all who might attack them on the day which Haman had appointed by lot for their destruction; and lastly, how the feast of Purim (Lots?) was instituted to commemorate their deliverance. Frequent incidental references are made to Persian court-usages (explanations are given in i. 13, viii. 8), while on the other hand the religious rites of the Jews (except fasting), and even Jerusalem and the temple, and the name of Israel, are studiously ignored. Even the name of God is not once mentioned, perhaps from a dread of its profanation during the Saturnalia of Purim. The early popularity of the book is shown by the interpolated passages in the Septuagint and the Old Latin versions.

The criticism of *Esther* began in the 18th century. As soon as the questioning spirit arose, the strangeness of many statements in the book leaped into view. A moderate scholar of our day can find no historical nucleus, and calls it a sort of historical romance.[1] The very first verses in the book

startle the reader by their exaggerations, *e.g.* a banquet lasting 180 days, "127 provinces." Farther on, the improbabilities of the plot are noticeable. Esther, on her elevation, keeps her Jewish origin secret (ii. 10; cf. vii. 3 ff.), although she has been taken from the house of her uncle, who is known to be a Jew (iii. 4; cf. vi. 13), and has remained in constant intercourse with him (ii. 11, 19, 20, 22; cf. iv. 4-17). We are further told that the grand-vizier was an Agagite or Amalekite (iii. 1, &c.); would the nobility of Persia have tolerated this? Or did Haman too keep his non-Persian origin secret? Also that Mordecai offered a gross affront to Haman, for which no slighter punishment would satisfy Haman than the destruction of the whole Jewish race (iii. 2-6). Of this savage design eleven months' notice is given (iii. 12-14); and when the danger has been averted by the cleverness of Esther, the provincial Jews are allowed to butcher 75,000, and those in the capital 800 of their Persian fellow-subjects (ix. 6-16).

It is urged, on the other hand, that the assembly mentioned in i. 3 may be that referred to by Herodotus (vii. 8) as having preceded the expedition against Greece. This hypothesis, however, requires us to suppose that Xerxes had returned from Sardis to Susa by the tenth month of the seventh year of his reign, which is barely credible. In the reckoning of 127 provinces (cf. Dan. vi. 1; 1 Esd. iii. 2) satrapies and sub-satrapies may be confounded. It is at any rate correct to include India among the provinces; this is justified, not only by Herodotus (iii. 94), but by the inscriptions of Darius at Persepolis and Naksh-i-Rustam. Herodotus again (vii. 8) confirms the custom referred to in Esth. ii. 12. But what authority can make the conduct of Mordecai credible? To-day the harem is impenetrable, while "any one declining to stand as the grand-vizier passes is almost beaten to death."[2] This, surely, is what a real Mordecai would have suffered from a real Haman. Even the capricious Xerxes would never have permitted the entire destruction of one of the races of the empire, nor would a vizier have proposed it.

Serious difficulties of another kind remain. Mordecai is represented as a fellow-captive of Jeconiah (597 B.C.), and grand-vizier in Xerxes's twelfth year (474 B.C.)! This is parallel to the strange statement in Tobit xiv. 15. And how can we find room for Esther as queen by the side of Amestris (Herod. vii. 14, ix. 112)? How, too, can a Jewess have been a legal queen (see Herod. iii. 84)? Then take the supposed Persian proper names. "Ahasuerus" may no doubt stand, but very few of the rest (see Nöldeke, *Ency. Bib.* col. 1402). As to the style, the general verdict is that it points to a late date (see Driver, *Introd.*[6], p. 484). Altogether, critics decline to date the book earlier than the 3rd or even 2nd century B.C.

So far we have only been carrying on 18th-century criticism. In more recent years, however, new lines of inquiry have been opened up. First of all by the great Semitic scholar Lagarde. His thesis (seldom defended now) was that Purim corresponds to Fūrdigan, the name of the old Persian New Year's and All Souls' festival held in spring, on which the Persians were wont to exchange presents (cf. Esth. ix. 19). In 1891 came a new explanation of Esther from Zimmern. It is true that in its earlier form his theory was very incomplete. But in justice to this scholar we may notice that from the first he looked for light to Babylonia, and that many other critics now take up the same position. There is 797
also another new point which has to be mentioned, viz. that, judging from our experience elsewhere, the Book of Esther has probably passed through various stages of development. Here, then, are two points which call for investigation, viz. (1) a possible mythological element in Esther, and (2) possible stages of development prior to that represented by the Hebrew text.

As to the first point. The Second Targum (on Esth. ii. 7) long ago declared that Esther was so called "because she was like the planet Venus." Recent scholars have expressed the same idea more critically. Esther is a modification of Ishtar, the name of the Babylonian goddess of fertility and of the planet Venus, whose myth must have been partially known to the Israelites even in pre-exilic times,[3] and after the fall of the state must have acquired a still stronger hold on Jewish exiles. A general knowledge of the myth of Marduk among the Israelites cannot indeed be proved. Singularly enough, the Babylonian colonists in the cities of Samaria are said to have made idols, not of Marduk, but of a deity called Succoth-benoth[4] (2 Kings xvii. 30). Nor does the Second Targum help us here; it gives a wild explanation of Mordecai as "pure myrrh." Still it is plain that the name of the god Marduk (Merodach) was known to the Jews, and the Cosmogony in Gen. i. is considered by critics to have ultimately arisen out of the myth of Marduk's conflict with the dragon (see Cosmogony). At any rate the name Mordecai (the vocalization is uncertain) looks very much like Marduk, which, with terminations added, often occurs in cuneiform documents as a personal name.[5] Add to this, that, according to Jensen, Ishtar in mythology was the cousin of Marduk, just as the legend represents Esther as the cousin of Mordecai.[6] The same scholar also accounts for Esther's other name Hadassah (Esth. ii. 7); *hadasshatu* in Babylonian means "bride," which may have been a title of Ishtar.

But we cannot stop short here. Unless the mythological key can also explain Haman and Vashti, it is of no use. Jensen, now followed by Zimmern, is equal to the occasion. Haman, he says, is a corruption of Hamman or Humman or Uman, the name of the chief deity of the Elamites, in whose capital (Susa) the scene of the narrative is laid, while Vashti is Mashti (or Vashti), probably the name of an Elamite goddess.

Following the real or fancied light of these names, Prof. Jensen holds that the Esther-legend is based on a mythological account of the victory of the Babylonian deities over those of Elam, which in plain prose means the deliverance of ancient Babylonia from its Elamite oppressors, and that such an account was closely connected with the Babylonian New Year's festival, called Zagmuk, just as the

Esther-legend is connected with the festival of Purim.

We are bound, however, to mention some critical objections. (1) The Babylonian festival corresponding to Purim was not the spring festival of Zagmuk, but the summer festival of Ishtar, which is probably the Sacaea of Berossus, an orgiastic festival analogous to Purim. (2) According to Jensen's theory, Mordecai, and not Esther, ought to be the direct cause of Haman's ruin. (3) No such Babylonian account as Jensen postulates can be indicated. (4) The identifications of names are hazardous. Fancy a descendant of Kish called Marduk, and an "Agagite" called Hamman! Elsewhere Mordecai (Ezra ii. 2; Neh. vii. 7) occurs among names which are certainly not Persian (Bigvai is no exception), and Haman (Tobit xiv. 10) appears as a nephew of Achiachar, which is not a Persian name. Esther, moreover, ought to be parallel to Judith; fancy likening the representative of Israel to the goddess Ishtar!

Next, as to the preliminary literary phases of Esther. Such phases are probable, considering the later phases represented in the Septuagint. There may have once existed in Hebrew a story of the deadly feud between Mordecai (if that be the original name) and Haman, with elements suggested by the story of the battle between the Supreme God and the dragon (see Cosmogony). As the legend stands, Mordecai and Esther seem to be in each other's way. In a passage (i. 5 in LXX.) only found in the Septuagint, but which may have belonged to the original Esther, reference is made to a dream of Mordecai respecting two great dragons, *i.e.* Mordecai and Haman (x. 7). This seems to confirm the view here mentioned. If so, however, there must also have been an Esther-legend, which was afterwards worked up with that of Mordecai. This is, in fact, the view of Erbt. Winckler takes a different line. Linguistic facts and certain points in the contents seem to him to show that our Esther is a work of the age of the Seleucidae; more precisely he thinks of the time of the revolt of Molon under Antiochus III. Of course there was a Book of Esther before this, and even in its redacted form our Esther reflects the period of three Persian kings, viz. Cyrus, Cambyses and Darius. Lastly, Cheyne (*Ency. Bib.* "Purim," § 7), while agreeing with Winckler that the book is based on an earlier narrative, holds that that earlier text differed more widely from the present in its geographical and historical setting than Winckler seems to suppose. The problem of the origin of the name Purim, however, can hardly be said to have received a final solution.

Bibliography.—Kuenen, *History of Israel*, iii. (1875), 148-153; Lagarde, *Purim* (1887); Zimmern in Stade's *Zeitschrift*, xi. (1891), pp. 157-169, and *Keilinschriften und das Alte Testament*(3), 485, 515-520, Jensen in Wildeboer's *Esther* (in Marti's series, 1898), pp. 173-175; Winckler, *Keilinschriften und das Alte Testament*(3), p. 288, *Altorientalische Forschungen*, 3rd ser. i. 1-64; Erbt, *Die Purimsage* (1900); *Ency. Biblica*, articles "Esther" and "Purim" (a composite article).

(T. K. C.)

Additions to Book of Esther. These "additions" were written originally in Greek and subsequently interpolated in the Greek translation of the Book of Esther. Here the principle of interpolation has reached its maximum. Of 270 verses, 107 are not to be found in the Hebrew text. These additions are distributed throughout the book in the Greek, but in the Latin Bible they were relegated to the end of the canonical book by Jerome—an action that has rendered them meaningless. In the Greek the additions form with the canonical text a consecutive history. They were made probably in the time of the Maccabees, and their aim was to supply the religious element which is so completely lacking in the canonical work. The first, which gives the dream of Mordecai and the events which led to his advancement at the court of Artaxerxes, precedes chap. i. of the canonical text: the second and fifth, which follow iii. 13 and viii. 12, furnish copies of the letters of Artaxerxes referred to in these verses; the third and fourth, which are inserted after chap. iv., consist of the prayers of Mordecai and Esther, with an account of Esther's approach to the king. The last, which closes the book, tells of the institution of the feast of Purim. The Greek text appears in two widely-differing recensions. The one is supported by AB$\aleph$, and the other—a revision of the first—by codices 19, 93a, 108b. The latter is believed to have been the work of Lucian. Swete, *Old Test. in Greek*, ii. 755, has given the former, while Lagarde has published both texts with critical annotations in his *Librorum Veteris Testamenti Canonicorum*, i. 504-541 (1883), and Scholz in his *Kommentar über das Buch Esther* (1892).

For an account of the Latin and Syriac versions, the Targums, and the later Rabbinic literature connected with this subject, and other questions relating to these additions, see Fritzsche, *Exeget. Handbuch zu den Apok.* (1851), i. 67-108; Schürer(3), iii. 330-332; Fuller in *Speaker's Apocr.* i. 360-402; Ryssel in Kautzsch's *Apok. u. Pseud.* i. 193-212; Siegfried in *Jewish Encyc.* v. 237 sqq.; Swete, *Introd. to the Old Test. in Greek*, 257 seq.; L.B. Paton, "A Text-Critical Apparatus to the Book of Esther" in *O.T. and Semitic Studies in Memory of W.R. Harper* (Chicago, 1908).

(R. H. C.)

1 Kautzsch, *Old Testament Literature* (1898), p. 130.

2 So Morier, the English minister to the Persian court, quoted by Dean Stanley.

3 See Zimmern, *Die Keilinschriften und das Alte Test.*(3), p. 438.

4 *Ibid.* p. 396.

5 Johns, *Assyrian Deeds*, iii. 198-199; *Amer. Journ. of Sem. Languages* (April 1902), p. 158.

6 So too Zimmern, in Gunkel's *Schöpfung und Chaos*, p. 313, note 2.

ESTHONIA (Ger. *Ehstland* and *Esthland*, Esthonian *Eestimaa* and *Meie-maa*, also *Viroma* and *Rahvama*; Lettish *Iggaun Senna*), a Baltic province of Russia, stretching along the south coast of the Gulf of Finland, and having Lake Peipus and Livonia on the S. and the government of St Petersburg on the E. An archipelago of islands, of which Dagö is the largest, belongs to this government (Oesel belongs to Livonia). The area is 7818 sq. m., 503 sq. m. of this being insular. The surface is low, not exceeding 100 ft. in altitude along the coast and alongside Lake Peipus, while in the interior the average elevation ranges from 200 to 300 ft., and nowhere exceeds 450 ft. It was entirely covered with the bottom moraine of the great ice-sheet of the Glacial Epoch, resting upon Silurian sandstones and limestones. In places sands and clays overlie the glacial deposits. The principal stream is the Narova, which issues from Lake Peipus, flows along the eastern border, and empties into the Gulf of Finland. The other drainage arteries are all small, but many in number; while lakes and marshes aggregate fully 22½% of the total surface. The climate is severe, great cold being experienced in winter, though moist west winds exercise a moderating influence. Nevertheless the annual mean temperature ranges between 39° and 43° Fahr. In 1878 the nobility, mostly of German descent, owned and farmed 52% of the land; 42% was farmed, but not owned, by the peasants, mostly Esths or Ehsts, and only 3% was owned by persons outside the ranks of the nobility. Since then one-fourth of the peasantry have been enabled to purchase their holdings, more than half a million acres having passed into their possession. Agriculture is the chief occupation, and it is, on all the larger holdings, carried on with greater scientific knowledge than in any other part of Russia. Of the total area about 16.6% is under cultivation; meadows and grass-lands amount to 41.7%; and forests cover 19%. The principal crops are rye, oats, barley and potatoes, with large quantities of vegetables. Cattle-breeding flourishes, and meat and butter are constantly increasing items of export. The manufactories consist chiefly of distilleries (over 13,500,000 gallons annually), cotton (at Kränholm falls on the Narova), woollen, flour, paper and saw mills, iron and machinery works, and match factories. Fishing is active along the coast, especially for anchovies. The province is intersected by a railway running from St Petersburg to Reval, with branches from the latter city westwards to Baltic Port and southwards into Livonia, and from Taps south to Yuryev (Dorpat). The chief seaports are Reval, Baltic Port, Hapsal, Kunda and Dagö. Esthonia is divided into four districts, the chief towns of which are Reval (pop. in 1897, 66,292), the capital of the province; Hapsal, a lively watering-place (3238); Weissenstein (2509); and Wesenberg (5560). The population, which consists chiefly of Ehstes (365,959 in 1897), Russians (18,000), Germans (16,000), Swedes (5800), and some Jews, is growing fairly fast: in 1870 it numbered 323,960, and in 1897 413,747, of whom 210,199 were women and 76,315 lived in towns; in 1906 it was estimated at 451,700. Ninety-six per cent. of the whole belong to the Lutheran Church. Education is, for Russia, relatively high.

The Esths, Ehsts or Esthonians, who call themselves Tallopoeg and Maamees, are known to the Russians as Chukhni or Chukhontsi, to the Letts as Iggauni, and to the Finns as Virolaiset. They belong to the Finnish family, and consequently to the Ural-Altaic division of the human race. Altogether they number close upon one million, and are thus distributed: 365,959 in Esthonia (in 1897), 518,594 in Livonia, 64,116 in the government of St Petersburg, 25,458 in that of Pskov, and 12,855 in other parts of Russia. As a race they exhibit manifest evidences of their Ural-Altaic or Mongolic descent in their short stature, absence of beard, oblique eyes, broad face, low forehead and small mouth. In addition to that they are an under-sized, ill-thriven people, with long arms and thin, short legs. They cling tenaciously to their native language, which is closely allied to the Finnish, and divisible into two, or according to some authorities into three, principal dialects—Dorpat Esthonian and Reval Esthonian, with Pernau Esthonian. Reval Esthonian, which preserves more carefully the full inflectional forms and pays greater attention to the laws of euphony, is recognized as the literary language. Since 1873 the cultivation of their mother-tongue has been sedulously promoted by an Esthonian Literary Society (*Eesti Korjameeste Selts*), which publishes *Toimetused*, or “Instructions” in all sorts of subjects. They have a decided love of poetry, and exhibit great facility in improvising verses and poems on all occasions, and they sing, everywhere, from morning to night. Like the Finns they possess rich stores of national songs. These, which bear an unmistakable family likeness to those of the great Finnish epic of the *Kalevala*, were collected as the Kalevi Poëg, and edited by Kreutswald (1857), and translated into German by Reinthal (1857-1859) and Bertram (1861) and by Löwe (1900). Other collections of *Esthnische Volkslieder* have been published by Neuss (1850-1852) and Kreutzwald and Neuss (1854); while Kreutzwald (1866) and Jannsen (1888) have published collections of legends and national tales. The earliest publication in Esthonian was a Lutheran catechism in the 16th century. An Esthonian translation of the New Testament was printed at Reval in 1715. Between 1813 and 1832 there appeared at Pernau twenty volumes of *Beiträge zur genauern Kenntniss der esthnischen Sprache*, by Rosenplänter, and from 1840 onwards many valuable papers on Esthonian subjects were contributed to the *Verhandlungen der gelehrten esthnischen Gesellschaft zu Dorpat*. F.J. Wiedemann, who laboured indefatigably in the registration and preservation of matters connected with Esthonian language and lore, published an *Esthnisch-deutsches Wörterbuch* (1865; 2nd ed. by Hurt, 1891, &c.), and in 1903 there appeared at Reval a *Deutsch-esthnisches Wörterbuch*, by Ploompun and Kann.

The Esthonians first appear in history as a warlike and predatory race, the terror of the Baltic seamen in consequence of their piracies. More than one of the Danish kings made serious attempts to subdue them. Canute VI. invaded their country (1194-1196) and forced baptism upon many of them, but no sooner did his war-ships disappear than they reverted to their former heathenism. In 1219 Waldemar II. undertook a more formidable crusade against them, in the course of which he founded the town and episcopal see of Reval. By his efforts the northern portion of the race were made

submissive to the Danish crown; but, though conquered, they were by no means subdued, and were incessantly in revolt, until, after a great rebellion in 1343, Waldemar IV. Atterdag sold for 19,000 marks his portion of Esthonia in 1346, to the order of the Knights of the Sword. These German crusaders had already, after a quarter of a century's fighting, in 1224 gained possession of the regions inhabited by the southern portion of the race, that is those now included in Livonia. From that time for nearly six hundred years or more the Esthonians were practically reduced to a state of serfdom to the German landowners. In 1521 the nobles and cities of Esthonia voluntarily placed themselves under the protection of the crown of Sweden; but after the wars of Charles XII., Esthonia was formally ceded to his victorious rival, Peter the Great, by the peace of Nystad (1721). Serfdom was abolished in 1817 by Tsar Alexander I.; but the condition of the peasants was so little improved that they rose in open revolt in 1859. Since 1878, however, a vast change for the better has been effected in their economic position (see above). The determining feature of their recent history has been the attempt made by the Russian government (since 1881) and the Orthodox Greek Church (since 1883) to russify and convert the inhabitants of the province, Germans and Esths alike, by enforcing the use of Russian in the schools and by harsh and repressive measures aimed at their native language.

See Merkel, *Die freien Letten und Esthen* (1820); Parrot, *Versuch einer Entwickelung der Sprache, Abstammung, &c., der Liwen, Lätten, Eesten* (1839); F. Kruse, *Urgeschichte des esthnischen Volksstammes* (1846); Wiedemann, *Grammatik der esthnischen Sprache* (1875), and *Aus dem innern und äussern Leben der Esthen* (1876); Köppen, *Die Bewohner Esthlands* (1847); F. Müller, *Beiträge zur Orographie und Hydrographie von Esthland* (1869-1871); Bunge, *Das Herzogthum Esthland unter den Königen von Dänemark* (1877); and Seraphim, *Geschichte Liv-, Est-, und Kurlands* (2nd ed., 1897) and various papers in the *Finnisch-Ugrische Forschungen*.

(P. A. K.; J. T. Be.; C. El.)

ESTIENNE (or Étienne; the French form of the name; anglicized to Stephens, and latinized to Stephanus), a French family of scholars and printers.

The founder of the race was Henri Estienne (d. 1520), the scion of a noble family of Provence, who came to Paris in 1502, and soon afterwards set up a printing establishment at the top of the rue Saint-Jean de Beauvais, on the hill of Saint-Geneviève opposite the law school. He died in 1520, and, his three sons being minors, the business was carried on by his foreman Simon de Colines, who in 1521 married his widow.

Robert Estienne (1503-1559) was Henri's second son. After his father's death he acted as assistant to his stepfather, and in this capacity superintended the printing of a Latin edition of the New Testament in 16mo (1523). Some slight alterations which he had introduced into the text brought upon him the censures of the faculty of theology. It was the first of a long series of disputes between him and that body. It appears that he had intimate relations with the new Evangelical preachers almost from the beginning of the movement, and that soon after this time he definitely joined the Reformed Church. In 1526 he entered into possession of his father's printing establishment, and adopted as his device the celebrated olive-tree (a reminiscence doubtless of his grandmother's family of Montolivet), with the motto from the epistle to the Romans (xi. 20), *Noli altum sapere*, sometimes with the addition *sed time*. In 1528 he married Perrette, a daughter of the scholar and printer Josse Bade (Jodocus Badius), and in the same year he published his first Latin Bible, an edition in folio, upon which he had been at work for the last four years. In 1532 appeared his *Thesaurus linguae Latinae*, a dictionary of Latin words and phrases, upon which for two years he had toiled incessantly, with no other assistance than that of Thierry of Beauvais. A second edition, greatly enlarged and improved, appeared in 1536, and a third, still further improved, in 3 vols. folio, in 1543. Though the *Thesaurus* is now superseded, its merits must not be forgotten. It was vastly superior to anything of the kind that had appeared before; it formed the basis of future labours, and even as late as 1734 was considered worthy of being re-edited. In 1539 Robert was appointed king's printer for Hebrew and Latin, an office to which, after the death of Conrad Neobar in 1540, he united that of king's printer for Greek. In 1541 he was entrusted by Francis I. with the task of procuring from Claude Garamond, the engraver and type-founder, three sets of Greek type for the royal press. The middle size were the first ready, and with these Robert printed the *editio princeps* of the *Ecclesiasticae Historiae* of Eusebius and others (1544). The smallest size were first used for the 16mo edition of the New Testament known as the *O mirificam* (1546), while with the largest size was printed the magnificent folio of 1550. This edition involved the printer in fresh disputes with the faculty of theology, and towards the end of the following year he left his native town for ever, and took refuge at Geneva, where he published in 1552 a caustic and effective answer to his persecutors under the title *Ad censuras theologorum Parisiensium, quibus Biblia a R. Stephano, Typographo Regio, ex usa calumniose notarunt, eiusdem R. S. responsio*. A French translation, which is remarkable for the excellence of its style, was published by him in the same year (printed in Rénouard's *Annales de l'imprimerie des Estienne*). At Geneva Robert proved himself an ardent partisan of Calvin, several of whose works he published. He died there on the 7th of September 1559.

It is by his work in connexion with the Bible, and especially as an editor of the New Testament, that he is on the whole best known. The text of his New Testament of 1550, either in its original form or in such slightly modified form as it assumed in the Elzevir text of 1634, remains to this day the traditional text. But this is due rather to its typographical beauty than to any critical merit. The readings of the fifteen MSS. which Robert's son Henri had collated for the purpose were merely introduced into the margin. The text was still almost exactly that of Erasmus. It was, however, the first edition ever published with a critical apparatus of any sort. Of the whole Bible Robert printed eleven editions—eight in Latin, two in Hebrew and one in French; while of the New Testament alone he printed twelve—five in Greek, five in Latin and two in French. In the Greek New Testament of 1551 (printed at Geneva) the present division into verses was introduced for the first time. The *editiones principes* which issued from Robert's press were eight in number, viz. *Eusebius*, including the *Praeparatio evangelica* and the *Demonstratio evangelica* as well as the *Historia ecclesiastica* already mentioned (1544-1546), *Moschopulus* (1545), *Dionysius of Halicarnassus* (February 1547), *Alexander Trallianus* (January 1548), *Dio Cassius* (January 1548), *Justin Martyr* (1551), *Xiphilinus* (1551), *Appian* (1551), the last being completed, after Robert's departure from Paris, by his brother Charles, and appearing under his name. These editions, all in folio, except the *Moschopulus*, which is in 4to, are unrivalled for beauty. Robert also printed numerous editions of Latin classics, of which perhaps the folio *Virgil* of 1532 is the most noteworthy, and a large quantity of Latin grammars and other educational works, many of which were written by Maturin Cordier, his friend and co-worker in the cause of humanism.

Charles Estienne (1504 or 1505-1564), the third son of Henri, was, like his brother Robert, a man of considerable learning. After the usual humanistic training he studied medicine, and took his doctor's degree at Paris. He was for a time tutor to Jean Antoine de Baïf, the future poet. In 1551, when Robert Estienne left Paris for Geneva, Charles, who had remained a Catholic, took charge of his printing establishment, and in the same year was appointed king's printer. In 1561 he became bankrupt, and he is said to have died in a debtors' prison.

His principal works are *Praedium Rusticum* (1554), a collection of tracts which he had compiled from ancient writers on various branches of agriculture, and which continued to be a favourite book down to the end of the 17th century; *Dictionarium historicum ac poëticum* (1553), the first French encyclopaedia; *Thesaurus Ciceronianus* (1557), and *De dissectione partium corporis humani libri tres*, with well-drawn woodcuts (1548). He also published a translation of an Italian comedy, *Gli Ingannati*, under the title of *Le Sacrifice* (1543; republished as *Les Abusez*, 1549), which had some influence on the development of French comedy; and *Paradoxes* (1553), an imitation of the *Paradossi* of Ortensio Landi.

Henri Estienne (1531-1598), sometimes called Henri II., was the eldest son of Robert. In the preface to his edition of Aulus Gellius (1585), addressed to his son Paul, he gives an interesting account of his father's household, in which, owing to the various nationalities of those who were employed on the press, Latin was used as a common language. Henri thus picked up Latin as a child, but by his own request he was allowed to learn Greek as a serious study before Latin. At the age of fifteen he become a pupil of Pierre Danès, at that time the first Greek scholar in France. Two years later he began to attend the lectures of Jacques Toussain, one of the royal professors of Greek, and in the same year (1545) was employed by his father to collate a MS. of Dionysius of Halicarnassus. In 1547 he went to Italy, where he spent three years in hunting for and collating MSS. and in intercourse with learned men. In 1550 he visited England, where he was favourably received by Edward VI., and then Flanders, where he learnt Spanish. In 1551 he joined his father at Geneva, which henceforth became his home. In 1554 he gave to the world, as the first fruits of his researches, two first editions, viz. a tract of Dionysius of Halicarnassus and the so-called "Anacreon." In 1556 he discovered at Rome ten new books (xi.-xx.) of Diodorus Siculus. In 1557 he issued from the press which in the previous year he had set up at Geneva three first editions, viz. *Athenagoras, Maximus Tyrius*, and some fragments of Greek historians, including Appian's Ἀννιβαλική, and Ἰβηρική and an edition of Aeschylus, in which for the first time the *Agamemnon* was printed in entirety and as a separate play. In 1559 he printed a Latin translation from his own pen of Sextus Empiricus, and an edition of Diodorus Siculus with the new books. His father dying in the same year, he became under his will owner of his press, subject, however, to the condition of keeping it at Geneva. In 1566 he published his best-known French work, the *Apologie pour Hérodote*, or, as he himself called it, *L'Introduction au traité de la conformité des merveilles anciennes avec les modernes ou Traité préparatif à l'Apologie pour Hérodote*. Some passages being considered objectionable by the Geneva consistory, he was compelled to cancel the pages containing them. The book became highly popular, and within sixteen years twelve editions were printed. In 1572 he published the great work upon which he had been labouring for many years, the *Thesaurus Graecae linguae*, in 5 vols. fol. The publication in 1578 of his *Deux Dialogues du nouveau françois ilalianizé* brought him into a fresh dispute with the consistory. To avoid their censure he went to Paris, and resided at the French court for a year. On his return to Geneva he was summoned before the consistory, and, proving contumacious, was imprisoned for a week. From this time his life became more and more of a nomad one. He is to be found at Basel, Heidelberg, Vienna, Pest, everywhere but at Geneva, these journeys being undertaken partly in the hope of procuring patrons and purchasers, for the large sums which he had spent on such publications as the *Thesaurus* and the *Plato* of 1578 had almost ruined him. His press stood nearly at a standstill. A few editions of classical authors were brought out, but each successive one showed a falling off. Such value as the later ones had was chiefly due to the notes furnished by Casaubon, who in 1586 had married his daughter Florence. His last years were marked by ever-increasing infirmity of mind and temper. In

1597 he left Geneva for the last time. After visiting Montpellier, where Casaubon was now professor, he started for Paris, but was seized with sudden illness at Lyons, and died there at the end of January 1598.

Few men have ever served the cause of learning more devotedly. For over thirty years the amount which he produced, whether as printer, editor or original writer, was enormous. The productions of his press, though printed with the same beautiful type as his father's books, are, owing to the poorness of the paper and ink, inferior to them in general beauty. The best, perhaps, from a typographical point of view, are the *Poëtae Graeci principes* (folio, 1566), the *Plutarch* (13 vols. 8vo, 1572), and the *Plato* (3 vols. folio, 1578). It was rather his scholarship which gave value to his editions. He was not only his own press-corrector but his own editor. Though by the latter half of the 16th century nearly all the important Greek and Latin authors that we now possess had been published, his untiring activity still found some gleanings. Eighteen first editions of Greek authors and one of a Latin author are due to his press. The most important have been already mentioned. Henri's reputation as a scholar and editor has increased of late years. His familiarity with the Greek language has always been admitted to have been quite exceptional; but he has been accused of want of taste and judgment, of carelessness and rashness. Special censure has been passed on his *Plutarch*, in which he is said to have introduced conjectures of his own into the text, while pretending to have derived them from MS. authority. But a late editor, Sintenis, has shown that, though like all the other editors of his day he did not give references to his authorities, every one of his supposed conjectures can be traced to some MS. Whatever may be said as to his taste or his judgment, it seems that he was both careful and scrupulous, and that he only resorted to conjecture when authority failed him. And, whatever the merit of his conjectures, he was at any rate the first to show what conjecture could do towards restoring a hopelessly corrupt passage. The work, however, on which his fame as a scholar is most surely based is the *Thesaurus Graecae linguae*. After making due allowance for the fact that considerable materials for the work had been already collected by his father, and that he received considerable assistance from the German scholar Sylburg, he is still entitled to the very highest praise as the producer of a work which was of the greatest service to scholarship and which in those early days of Greek learning could have been produced by no one but a giant. Two editions of the *Thesaurus* were published in the 19th century—at London by Valpy (1815-1825) and at Paris by Didot (1831-1863).

It was one of Henri Estienne's great merits that, unlike nearly all the French scholars who preceded him, he did not neglect his own language. In the *Traité de la conformité du langage françois avec le Grec* (published in 1565, but without date; ed. L. Feugère, 1850), French is asserted to have, among modern languages, the most affinity with Greek, the first of all languages. *Deux Dialogues du nouveau françois italianizé* (Geneva, 1578; ed. P. Ristelhuber, 2 vols., 1885) was directed against the fashion prevailing in the court of Catherine de' Medici of using Italian words and forms. The *Project du livre intitulé de la Précellence du langage françois* (Paris, 1579; ed. E. Huguet, 1896) treats of the superiority of French to Italian. An interesting feature of the *Précellence* is the account of French proverbs, and, Henry III. having expressed some doubts as to the genuineness of some of them, Henri Estienne published, in 1594, *Les Premices ou le I. livre des Proverbes epigrammatizez* (never reprinted and very rare).

Finally, there remains the *Apologie pour Hérodote*, his most famous work. The ostensible object of the book is to show that the strange stories in Herodotus may be paralleled by equally strange ones of modern times. Virtually it is a bitter satire on the writer's age, especially on the Roman Church. Put together without any method, its extreme desultoriness makes it difficult to read continuously, but the numerous stories, collected partly from various literary sources, notably from the preachers Menot and Maillard, partly from the writer's own multifarious experience, with which it is packed, make it an interesting commentary on the manners and fashions of the time. But satire, to be effective, should be either humorous or righteously indignant, and, while such humour as there is in the *Apologie* is decidedly heavy, the writer's indignation is generally forgotten in his evident relish for scandal. The style is, after all, its chief merit. Though it bears evident traces of hurry, it is, like that of all Henri Estienne's French writings, clear, easy and vigorous, uniting the directness and sensuousness of the older writers with a suppleness and logical precision which at this time were almost new elements in French prose. An edition of the *Apologie* has recently been published by Liseux (ed. Ristelhuber, 2 vols., 1879), after one of the only two copies of the original uncancelled edition that are known to exist. The very remarkable political pamphlet entitled *Dìscours merveilleux de la vie et actions et déportemens de Catherine de Medicis*, which appeared in 1574, has been ascribed to Henri Estienne, but the evidence both internal and external is conclusive against his being the author of it. Of his Latin writings the most worthy of notice are the *De Latinitate falso suspecta* (1576), the *Pseudo-Cicero* (1577) and the *Nizoliodidascalus* (1578), all three written against the Ciceronians, and the *Francofordiense Emporium* (1574), a panegyric on the Frankfort fair (reprinted with a French translation by Liseux, 1875). He also wrote a large quantity of indifferent Latin verses, including a long poem entitled *Musa monitrix Principum* (Basel, 1590).

The primary authorities for an account of the Estiennes are their own works. In the garrulous and egotistical prefaces which Henri was in the habit of prefixing to his editions will be found many scattered biographical details. Twenty-seven letters from Henri to John Crato of Crafftheim (ed. F. Passow, 1830) have been printed, and there is one of Robert's in Herminjard's *Correspondence des Réformateurs dans de pays de langue française* (9 vols. published 1866-1897), while a few other contemporary references to him will be found in the same work. The secondary authorities are Janssen van Almeloveen, *De vitis Stephanorum* (Amsterdam, 1683); Maittaire, *Stephanorum historia* (London, 1709); A.A. Rénouard, *Annales de l'imprimerie des Estienne* (2nd ed., Paris, 1843); the article on Estienne by A.F. Didot in the *Nouv. Biog. gén.*; Mark Pattison, *Essays*, i. 67 ff. (1889); L.

Clément, *Henri Estienne et son œuvre française* (Paris, 1899). There is a good account of Henri's *Thesaurus* in the *Quart. Rev.* for January 1820, written by Bishop Bromfield.

(A. A. T.)

ESTON, an urban district in the Cleveland parliamentary division of the North Riding of Yorkshire, England, 4 m. S.E. of Middlesbrough, on a branch of the North Eastern railway. Pop. (1901) 11,199. This is one of the principal centres from which the great ironstone deposits of the Cleveland Hills are worked, and there are extensive blast-furnaces, iron-foundries and steam sawing-mills in the district. Immediately W. of Eston lies the urban district of Ormesby (pop. 9482), and the whole district is densely populated (see MIDDLESBROUGH). Marton, west of Ormesby, was the birthplace of Captain Cook (1728). Numerous early earthworks fringe the hills to the south.

ESTOPPEL (from O. Fr. *estopper*, to stop, bar; *estoupe*, mod. *étoupe*, a plug of tow; Lat. *stuppa*), a rule in the law of evidence by which a party in litigation is prohibited from asserting or denying something, when such assertion or denial would be inconsistent with his own previous statements or conduct. Estoppel is said to arise in three ways—(1) by record or judgment, (2) by deed, and (3) by matter *in pais* or conduct. (1) Where a cause of action has been tried and final judgment has been pronounced, the judgment is conclusive—either party attempting to renew the litigation by a new action would be estopped by the judgment. "Every judgment is conclusive proof as against parties and privies, of facts directly in issue in the case, actually decided by the court, and appearing from the judgment itself to be the ground on which it was based."—Stephen's *Digest of the Law of Evidence*, Art. 41. (2) It is one of the privileges of *deeds* as distinguished from simple contracts that they operate by way of estoppel. "A man shall always be estopped by his own deed, or not permitted to aver or prove anything in contradiction to what he has once so solemnly and deliberately avowed" (Blackstone, 2 *Com.* 295); *e.g.* where a bond recited that the defendants were authorized by acts of parliament to borrow money, and that under such authority they had borrowed money from a certain person, they were estopped from setting up as a defence that they did not in fact so borrow money, as stated by their deed. (3) Estoppel by conduct, or, as it is still sometimes called, estoppel by matter *in pais*, is the most important head. The rule practically comes to this that, when a person in his dealings with others has acted so as to induce them to believe a thing to be true and to act on such belief, he may not in any proceeding between himself and them deny the thing to be true: *e.g.* a partner retiring from a firm without giving notice to the customers, cannot, as against a customer having no knowledge of his retirement, deny that he is a partner. As between landlord and tenant the principle operates to prevent the denial by the tenant of the landlord's title. So if a person comes upon land by the licence of the person in possession, he cannot deny that the licenser had a title to the possession at the time the licence was given. Again, if a man accepts a bill of exchange he may not deny the signature or the capacity of the drawer. So a person receiving goods as baillee from another cannot deny the title of that other to the goods at the time they were entrusted to him.

Estoppel of whatever kind is subject to one general rule, that it cannot override the law of the land; for example, a corporation would not be estopped as to acts which are *ultra vires*.

See L.F. Everest and E. Strode, *The Law of Estoppel*; M. Cababé, *Principles of Estoppel*.

ESTOUTEVILLE, GUILLAUME D' (1403-1483), French ecclesiastic, was bishop of Angers, of Digne, of Porto and Santa Rufina, of Ostia and Velletri, archbishop of Rouen, prior of Saint Martin des Champs, abbot of Mont St Michel, of St Ouen at Rouen, and of Montebourg. He was sent to France as legate by Pope Nicholas V. to make peace between Charles VII. and England (1451), and undertook, *ex officio*, the revision of the trial of Joan of Arc; he afterwards reformed the statutes of the university of Paris. He then went to preside over the assembly of clergy which met at Bourges to discuss the observation of the Pragmatic Sanction (see BASEL, COUNCIL OF), finally returning to Rome, where he passed almost all the rest of his life. He was a great builder, Rouen, Mont St Michel, Pontoise and Gaillon owing many noble buildings to his initiative.

ESTOVERS (from the O. Fr. *estover*, *estovoir*, a verb used as a substantive in the sense of that which is necessary; the word is of disputed origin; it has been referred to the Lat. *stare*, to stand, or *studere*, to desire), a term, in English law, for the wood which a tenant for life or years may take from the land he holds for repair of his house, the implements of husbandry, and the hedges and fences, and for firewood. The O. Eng. word for estover was *bote* or *boot* (literally meaning "good," "profit," the same word as seen in "better"). The various kinds of estovers were thus known as house-bote, cart or plough-bote, hedge or hay-bote, and fire-bote respectively. These rights may, of course, be restricted by express covenants. Copyholders have similar rights over the land they occupy and over the waste of the manor, in which case the rights are known as "Commons of estovers." (See COMMONS.)

ESTRADA, LA, a town of north-western Spain, in the province of Pontevedra, 15 m. S. by E. of Santiago de Compostela. Pop. (1900) 23,916. La Estrada is the chief town of a densely-populated mountainous district; its industries are agriculture, stock-breeding, and the manufacture of linen and woollen cloth. Timber from the mountain forests is conveyed from La Estrada to the river Ulla, 4 m. N., and thence floated down to the seaports on Arosa Bay. The nearest railway-station is Requeijo, 7 m. W., on the Pontevedra-Santiago railway. There are mineral springs at La Estrada and at Caldas de Reyes, 11 m. W.S.W.

ESTRADE, a French architectural term for a raised platform (see DAIS). In the Levant the estrade of a divan is called Sopha (Blondel), from which comes our "sofa."

ESTRADES, GODEFROI, COMTE D' (1607-1686), French diplomatist and marshal, was born at Agen. He was the son of François d'Estrades (d. 1653), a partisan of Henry IV., and brother of Jean d'Estrades, bishop of Condom. He became a page to Louis XIII., and at the age of nineteen was sent on a mission to Maurice of Holland. In 1646 he was named ambassador extraordinary to Holland, and took part in the conferences at Münster. Sent in 1661 to England, he obtained in 1662 the restitution of Dunkirk. In 1667 he negotiated the treaty of Breda with the king of Denmark, and in 1678 the treaty of Nijmwegen, which ended the war with Holland. Independently of these diplomatic missions, he took part in the principal campaigns of Louis XIV., in Italy (1648), in Catalonia (1655), in Holland (1672); and was created marshal of France in 1675. He left *Lettres, mémoires et négociations en qualité d'ambassadeur en Hollande depuis 1663 jusqu' en 1668*, of which the first edition in 1700 was followed by a nine-volume edition (London (the Hague), 1743).

Of the sons of Godefroi d'Estrades, Jean François d'Estrades was ambassador to Venice and Piedmont; Louis, marquis d'Estrades (d. 1711), succeeded his father as governor of Dunkirk, and was the father of Godefroi Louis, comte d'Estrades, lieutenant-general, who was killed at the siege of Belgrade, 1717.

See Felix Salomon, *Frankreichs Beziehungen zu dem Scottischen Aufstand* (1637-1640), containing an excursus on the falsification of the letters of the comte d'Estrades; Philippe Lauzun, *Le Maréchal d'Estrades* (Agen, 1896).

ESTREAT (O. Fr. *estrait*, Lat. *extracta*), originally, a true copy or duplicate of some original writing or record; now used only with reference to the enforcement of a forfeited recognizance. At one time it was the practice to extract and certify into the exchequer copies of entries in court roils which contained provisions or orders in favour of the treasury, hence the estreating of a recognizance was the taking out from among the other records of the court in which it was filed and sending it to the exchequer to be enforced, or sending it to the sheriff to be levied by him, and then returned by the clerk of the peace to the lords of the treasury. (See RECOGNIZANCE.)

ESTRÉES, GABRIELLE D' (1573-1599), mistress of Henry IV. of France, was the daughter of Antoine d'Estrées, marquis of Cœuvres, and Françoise Babou de la Bourdaisière. Henry IV., who in November 1590 stayed at the castle of Cœuvres, became violently enamoured of her. Her father, anxious to save his daughter from so perilous an entanglement, married her to Nicholas d'Amerval, seigneur de Liancourt, but the union proved unhappy, and in December 1592, Gabrielle, whose affection for the king was sincere, became his mistress. She lived with him from December 1592 onwards, and bore him several children, who were recognized and legitimized by him. She possessed the king's entire confidence; he willingly listened to her advice, and created her marchioness of Monceaux, duchess of Beaufort (1597) and Étampes (1598), a peeress of France. The king even proposed to marry her in the event of the success of his suit for the nullification by the Holy See of his marriage with Margaret of Valois; but before the question was settled Gabrielle died, on the 10th of April 1599. Poison was of course suspected; but her death was really caused by puerperal convulsions (*eclampsia*).

See Adrien Desclozeaux, *Gabrielle d'Estrées, Marquise de Monceaux, &c.* (Paris, 1889).

ESTREMADURA, or Extremadura, an ancient territorial division of central and western Portugal, and of western Spain; comprising the modern districts of Leiria, Santarem and Lisbon, in Portugal, and the modern provinces of Badajoz and Cáceres in Spain. Pop. (1900) 2,095,818; area, 23,055 sq. m. The name of Estremadura appears to be of early Romance or Late Latin origin, and probably was applied to all the far western lands (*extrema ora*) bordering upon the lower Tagus, as far as the Atlantic Ocean. It is thus equivalent to *Land's End*, or *Finistère*. In popular speech it is more commonly used than the names of the modern divisions mentioned above, which were created in the 19th century. As, however, there are many racial, economic and historic differences between Portuguese and Spanish Estremadura, the two provinces are separately described below.

1. Portuguese Estremadura is bounded on the N. by Beira, E. and S. by Alemtejo, and W. by the Atlantic Ocean. Pop. (1900) 1,221,418; area, 6937 sq. m. The greatest length of the province, from N. to S., is 165 m.; its greatest breadth, from E. to W., is 72 m. The general uniformity of the coast-line is broken by the broad and deep estuaries of the Tagus and the Sado, and by the four conspicuous promontories of Cape Carvoeiro, Cape da Roca, Cape Espichel and Cape de Sines. The Tagus is the great navigable waterway of Portuguese Estremadura, flowing from north-east to south-west, and fed by many minor tributaries, notably the Zezere on the right and the Zatas on the left. It divides the country into two nearly equal portions, wholly dissimilar in surface and character. South of the Tagus the land is almost everywhere low, flat and monotonous, while in several places it is rendered unhealthy by undrained marshes. The Sado, which issues into Setubal Bay, is the only important river of this region. North of the Tagus, and parallel with its right bank, extends the mountain chain which is known at its northern extremity as the Serra do Aire and, where it terminates above Cape da Roca, as the Serra da Cintra. This ridge, which is buttressed on all sides by lesser groups of hills, and includes part of the famous lines of Torres Vedras (*q.v.*), exceeds 2200 ft. in height, and constitutes the watershed between the right-hand tributaries of the Tagus and the Liz, Sizandro and other small rivers which flow into the Atlantic. On its seaward side, except for the line of sheer and lofty cliffs between Cape Carvoeiro and Cape da Roca, the country is mostly flat and sandy, with extensive heaths and pine forests; but along the fertile and well-cultivated right bank of the Tagus the river scenery, with its terraced hills of vines, olives and fruit trees, often resembles that of the Rhine in Germany. The natural resources of Portuguese Estremadura, with its inhabitants, industries, commerce, communications, &c., are described under Portugal; for on such matters there is little to be said of this central and most characteristic province which does not apply to the whole kingdom. Separate articles are also devoted to Lisbon, the capital, and Abrantes, Cintra, Leiria, Mafra, Santarem, Setubal, Thomar, Torres Novas and Torres Vedras, the other chief towns. The women of Peniche, a small fishing village on the promontory of Cape Carvoeiro, have long been celebrated throughout Portugal for their skill in the manufacture of fine laces.

2. Spanish Estremadura is bounded on the N. by Leon and Old Castile, E. by New Castile, S. by Andalusia, and W. by the Portuguese province of Beira and Alemtejo, which separate it from Portuguese Estremadura. Pop. (1900) 882,410; area, 16,118 sq. m. Spanish Estremadura consists of a tableland separated from Leon and Old Castile by the lofty Sierra de Gredos, the plateau of Béjar and the Sierra de Gata, which form an almost continuous barrier along the northern frontier, with its summits ranging from 6000 to more than 8500 ft. in altitude. On the south the comparatively low range of the Sierra Morena constitutes the frontier of Andalusia; on the east and west there is a still more gradual transition to the plateau of New Castile and the central plains of Portugal. The tableland of Spanish Estremadura is itself bisected from east to west by a line of mountains, the Sierras of San Pedro, Montanchez and Guadalupe (4000-6000 ft.), which separate its northern half, drained by the river Tagus, from its southern half, drained by the Guadiana. These two halves are respectively known as Alta or Upper Estremadura (the modern Cáceres), and Baja or Lower Estremadura (the modern Badajoz). The Tagus and Guadiana flow from east to west through a monotonous country, level or slightly undulating, often almost uninhabited, and covered with a thin

growth of shrubs and grass. Perhaps the most characteristic feature of this tableland is the vast heaths of gum-cistus, which in spring colour the whole landscape with leagues of yellow blossom, and in summer change to a brown and arid wilderness.

The climate in summer is hot but not unhealthy, except in the swamps which occur along the Guadiana. The rainfall is scanty; dew, however, is abundant and the nights are cool. Although the high mountains are covered with snow in November, the winters are not usually severe. The soil is naturally fertile, but drought, floods and locusts render agriculture difficult, and sheep-farming is the most important of Estremaduran industries. (See SPAIN: *Agriculture*.) In the 19th century, however, this industry lost much of its former importance owing to foreign competition.

Immense herds of swine are bred and constitute a great source of support to the inhabitants, not only supplying them with food, but also forming a great article of export to other provinces—the pork, bacon and hams being in high esteem. The beech, oak and chestnut woods afford an abundance of food for swine, and there are numerous plantations of olive, cork and fruit trees, but a far greater area of forest has been destroyed. For an account of commerce, mining, communications, &c., in Spanish Estremadura, with a list of the chief towns, see CÁCERES and BADAJOZ. In character and physical type, the people of this region are less easily classified than those of other Spanish provinces. They lack the endurance and energy of the Galicians, the independent and enterprising spirit of the Asturians, Basques and Catalans, the culture of the Castilians and Andalusians. Their failure to develop a distinctive local type of character and civilization is perhaps due to the adverse economic history of their country. The two great waterways which form the natural outlet for Estremaduran commerce flow to the Atlantic through a foreign and, for centuries, a hostile territory. Like other parts of Spain, Estremadura suffered severely from the expulsion of the Jews and Moors (1492-1610), while the compensating treasure, derived during the same period from Spanish America, never reached a province so remote at once from the sea and from the chief centres of national life. Although Cortes (1485-1547), the conqueror of Mexico and Pizarro (*c.* 1471-1541), the conqueror of Peru, were both born in Estremadura, their exploits, far from bringing prosperity to their native province, only encouraged the emigration of its best inhabitants. Heavy taxation and harsh land-laws prevented any recovery, while the felling of the forests reduced many fertile areas to waste land, and rendered worse a climate already unfavourable to agriculture. Few countries leave upon the mind of the traveller a deeper impression of hopeless poverty.

ESTREMOZ, a town of Portugal, in the district of Evora, formerly included in the province of Alemtejo; 104 m. by rail E. of Lisbon, on the Casa Branca-Evora-Elvas railway. Pop. (1900) 7920. Estremoz is built at the base of a hill crowned by a large dismantled citadel; its fortifications, which in the 17th century accommodated 20,000 troops and rendered the town one of the principal defences of the frontier, are now obsolete. There are marble quarries in the neighbourhood, and the Estremoz *bilhas*, red earthenware jars, are used throughout Portugal as water-holders and exported to Spain. At Ameixial (1188) and Monies Claros, near Estremoz, the Spanish were severely defeated by the Portuguese in 1663 and 1665. Villa Viçosa (3841), 10 m. S.E., is a town of pre-Roman origin, containing a royal palace. The altars with Latin inscriptions to the Iberian god Endovellicus, found at Villa Viçosa, are preserved in the museum of the Royal Academy of Sciences, Lisbon.

ESTUARY (from the Lat. *aestuarium*, a place reached by *aestus*, the tide), an arm of the sea narrowing inwards at the mouth of a river where sea and fresh water meet and are mixed, *i.e.* the tidal portion of a river's mouth. Structurally the estuary may represent the long-continued action of river erosion and tidal erosion confined to a narrow channel, most effective where most concentrated, or an estuary may be the drowned portion of the lower part of a river-valley. In a map of Britain showing sea-depths it will be observed that under the Severn estuary the sea deepens in a number of steps descending by concentric V's that become blunter towards deep water until the last is a mere indentation pointing towards the long narrow termination of the present estuary. In this and in similar cases the progress of the estuary is indicated upon what is now the continental shelf. The chief interest in estuarine conditions is the mingling of sea and fresh water. Where, as in the Severn and the Thames, the fresh water meets the sea gradually the water is mixed, and there is very little change in salinity at high tide. The fresh water flows over the salt water and there is a continuous rapid change, in salinity towards the sea, for the currents sweeping in and out mix the water constantly. Where the river brings down a great quantity of fresh water in a narrow channel, the change of salinity at high and low water is very marked. "When, however, the inlet is very large compared with the river, and there is no bar at the opening, the estuarine character is only shown at the upper end. In the Firth of Forth, for example, the landward half is an estuary, but in the seaward

half the water has become more thoroughly mixed, the salinity is almost uniform from surface to bottom, and increases very gradually towards the sea. The river-water meets the sea diffused uniformly through a deep mass of water scarcely fresher than the sea itself, so that the two mix uniformly, and the sea becomes slightly freshened throughout its whole depth for many miles from land" (H.R. Mill, *Realm of Nature*, 1897).

ESZTERGOM (Ger. *Gran*; Lat. *Strigonium*), a town of Hungary, capital of the county of the same name, 36 m. N.W. of Budapest by rail. Pop. (1900) 16,948, mostly Magyars and Roman Catholics. It is situated on the right bank of the Danube, nearly opposite the confluence of the Gran, and is divided into the town proper and three suburbs. The town is the residence of the primate of Hungary, and its cathedral, built in 1821-1870, after the model of St Peter's at Rome, is one of the finest and largest in the country. It is picturesquely built on an elevated and commanding position, 215 ft. above the Danube, and its dome, visible from a long distance, is 260 ft. high, and has a diameter of 52 ft. The interior is very richly decorated, notably with fine frescoes, and its treasury and fine library of over 60,000 volumes are famous. Besides several other churches and two monastic houses, the principal buildings include the handsome palace of the primate, erected in 1883; the archiepiscopal library, with valuable incunabula and old MSS.; the seminary for the education of Roman Catholic priests; the residences of the chapter; and the town-hall. The population is chiefly employed in cloth-weaving, wine-making and agricultural pursuits. An iron bridge, 1664 ft. long, connects Esztergom with the market town of Párkány (pop. 2836) on the opposite bank of the Danube.

Esztergom is one of the oldest towns of Hungary, and is famous as the birthplace of St Stephen, the first prince crowned "apostolic king" of Hungary. During the early times of the Hungarian monarchy it was the most important mercantile centre in the country, and it was the meeting-place of the diets of 1016, 1111, 1114 and 1256. It was almost completely destroyed by Tatar hordes in 1241, but was rebuilt and fortified by King Béla IV. In 1543 it fell into the hands of the Turks, from whom it was recovered, in 1595, by Carl von Mansfeld. In 1604 it reverted to the Turks, who held it till 1683, when it was regained by the united forces of John Sobieski, king of Poland, and Prince Charles of Lorraine. It was created an archbishopric in 1001. During the Turkish occupation of the town the archbishopric was removed to Tyrnau, while the archbishop himself had his residence in Pressburg. Both returned to Esztergom in 1820. In 1708 it was declared a free city by Joseph I. On the 13th of April 1818 it was partly destroyed by fire.

For numerous authorities on the see and cathedral of Esztergom see V. Chevalier, *Répertoire des sources. Topo-bibliogr.* s.v. "Gran." Of these may be mentioned especially F. Knauz, *Monumenta Ecclesiae Strigoniensis* (3 vols., Eszterg, 1874); Joseph Dankó, *Geschichtliches ... aus dem Graner Domschatz* (Gran, 1880).

ÉTAGÈRE, a piece of light furniture very similar to the English what-not, which was extensively made in France during the latter part of the 18th century. As the name implies, it consists of a series of stages or shelves for the reception of ornaments or other small articles. Like the what-not it was very often cornerwise in shape, and the best Louis XVI. examples in exotic woods are exceedingly graceful and elegant.

ETAH, a town and district of British India, in the Agra division of the United Provinces. The town is situated on the Grand Trunk road. Pop. (1901) 8796. The district has an area of 1737 sq. m. The district consists for the most part of an elevated alluvial plateau, dipping down on its eastern slope into the valley of the Ganges. The uplands are irrigated by the Ganges canal. Between the modern bed of the Ganges and its ancient channel lies a belt of fertile land, covered with a rich deposit of silt, and abundantly supplied with natural moisture. A long line of swamps and hollows still marks the former course of the river; and above it rises abruptly the original cliff which now forms the terrace of the upland plain. The Kali Nadi, a small stream flowing in a deep and narrow gorge, passes through the centre of the district, and affords an outlet for the surface drainage. Etah was at an early date the seat of a primitive Aryan civilization, and the surrounding country is mentioned by Hsüan Tsang, the Chinese Buddhist pilgrim of the 7th century A.D., as rich in temples and monasteries. But after the bloody repression of Buddhism before the 8th century, the district seems to have fallen once

more into the hands of aboriginal tribes, from whom it was wrested a second time by Rajputs during the course of their great migration eastward. With the rest of upper India it passed under the sway of Mahmud of Ghazni in 1017, and thenceforth followed the fortunes of the Mahommedan empire. At the end of the 18th century it formed part of the territory over which the wazir of Oudh had made himself ruler, and it came into the possession of the British government in 1801, under the treaty of Lucknow. During the mutiny of 1857 it was the scene of serious disturbances, coupled with the usual anarchic quarrels among the native princes. In 1901 the population was 863,948, showing an increase of 23% in the decade due to the extension of canal irrigation. It is traversed by a branch of the Rajputana railway from Agra to Cawnpore, with stations at Kasganj and Soron, which are the two largest towns. It has several printing presses, indigo factories, and factories for pressing cotton, and there is a considerable agricultural export trade.

ÉTAMPES, ANNE DE PISSELEU D'HEILLY, Duchesse d' (1508-*c.* 1580), mistress of Francis I. of France, daughter of Guillaume de Pisseleu, sieur d'Heilly, a nobleman of Picardy. She came to court before 1522, and was one of the maids of honour of Louise of Savoy. Francis I. made her his mistress, probably on his return from his captivity at Madrid (1526), and soon gave up Madame de Châteaubriant for her. Anne was sprightly, pretty, witty and cultured, and succeeded in keeping the favour of the king till the end of the reign (1547). The liaison received some official recognition; when Queen Eleanor entered Paris (1530), the king and Anne occupied the same window. In 1533 Francis gave her in marriage to Jean de Brosse, whom he created duc d'Étampes. The influence of the duchesse d'Étampes, especially in the last years of the reign, was considerable. She upheld Admiral Chabot against the constable de Montmorency, who was supported by her rival, Diane de Poitiers, the dauphin's mistress. She was a friend to new ideas, and co-operated with the king's sister, Marguerite d'Angoulême. She used her influence to elevate and enrich her family, her uncle, Antoine Sanguin (d. 1559), being made bishop of Orleans in 1535 and a cardinal in 1539.[1] The accusations made against her of having allowed herself to be won over by the emperor Charles V. and of playing the traitor in 1544 rest on no serious proof. After the death of Francis I. (1547) she was dismissed from the court by Diane de Poitiers, humiliated in every way, and died in obscurity much later, probably in the reign of Henry III.

See Paulin Paris, *Études sur François Ier* (Paris, 1885).

1 The château of Meudon, belonging to the Sanguin family, was handed over to the duchesse d'Étampes in 1539. Sanguin was translated to Limoges in 1546, and became archbishop of Toulouse in 1550.

ÉTAMPES, a town of northern France, capital of an arrondissement in the department of Seine-et-Oise, on the Orléans railway, 35 m. S. by W. of Paris. Pop. (1906) 8720. Étampes is a long straggling town hemmed in between the railway on the north and the Chalouette on the south; the latter is a tributary of the Juine which waters the eastern outskirts of the town. A fine view of Étampes is obtained from the Tour Guinette, a ruined keep built by Louis VI. in the 12th century on an eminence on the other side of the railway. Notre-Dame du Fort, the chief church, dates from the 11th and 12th centuries; irregular in plan, it is remarkable for a fine Romanesque tower and spire, and for the crenellated wall which partly surrounds it. The interior contains ancient paintings and other artistic works. St Basile (12th and 16th centuries), which preserves a Romanesque doorway, and St Martin (12th and 13th centuries), with a leaning tower of the 16th century, are of less importance. The civil buildings offer little interest, but two houses named after Anne de Pisseleu (see above), mistress of Francis I., and Diane de Poitiers, mistress of Henry II., are graceful examples of Renaissance architecture. In the square there is a statue of the naturalist, Geoffroy Saint-Hilaire, who was born in Étampes. The subprefecture, a tribunal of first instance, and a communal college are among the public institutions of Étampes. Flour-milling, metal-founding, leather-dressing, printing and the manufacture of boots and shoes and hosiery are carried on; there are quarries of paving-stone, nurseries and market gardens in the vicinity, and the town has important markets for cereals and sheep.

Étampes (Lat. *Stampae*) existed at the beginning of the 7th century and in the early middle ages belonged to the crown domain. During the middle ages it was the scene of several councils, the most notable of which took place in 1130 and resulted in the recognition of Innocent II. as the legitimate pope. In 1652, during the war of the Fronde it suffered severely at the hands of the royal troops under Turenne.

Lords, Counts and Dukes of Étampes.—The lordship of Étampes, in what is now the department of Seine et Oise in France, belonged to the royal domain, but was detached from it on several occasions

in favour of princes, or kings' favourites. St Louis gave it to his mother Blanche of Castile, and then to his wife Marguerite of Provence. Louis, the brother of Philip the Fair, became lord of Étampes in 1317 and count in 1327; he was succeeded by his son and his grandson. Francis I. raised the countship of Étampes to the rank of a duchy for his mistress Anne de Pisseleu D'Heilly. The new duchy passed to Diane de Poitiers (1553), to Catherine of Lorraine, duchess of Montpensier (1578), to Marguerite of Valois (1582) and to Gabrielle d'Estrées (1598). The latter transmitted it to her son, César of Vendôme, and his descendants held it till 1712. It then passed by inheritance to the families of Bourbon-Conti and of Orleans.

ÉTAPLES, a town of northern France, in the department of Pas-de-Calais, on the right bank of the estuary of the Canche, 3 m. from the Straits of Dover, 17 m. S. of Boulogne by rail. Pop. (1906) 5136. Étaples has a small fishing and commercial port which enjoyed a certain importance during the middle ages. Boat-building is carried on. There is an old church with a statue of the Virgin much revered by the sailors. The Canche is crossed by a bridge over 1600 ft. in length. Le Touquet, in the midst of pine woods, and the neighbouring watering-place of Paris-Plage, 3½ m. W. of Étaples at the mouth of the estuary, are much frequented by English and French visitors for golf, tennis and bathing, and Étaples itself is a centre for artists. Antiquarian discoveries in the vicinity of Étaples have led to the conjecture that it occupies the site of the Gallo-Roman port of *Quentovicus*. In 1492 a treaty was signed here between Henry VII., king of England, and Charles VIII., king of France.

ETAWAH, a town and district of British India, in the Agra division of the United Provinces. The town is situated on the left bank of the Jumna, and has a station on the East Indian railway, 206 m. from Allahabad. Pop. (1901) 42,570. Deep fissures intersect the various quarters of the town, over which broad roads connect the higher portions by bridges and embankments. The Jama Masjid (Great Mosque) is the chief architectural ornament of Etawah. It was originally a Hindu temple, and was adapted to its present use by the Mahommedan conquerors. Several fine Hindu temples also stand about the mound on which are the ruins of the ancient fort. Etawah is now only the civil headquarters of the district, the military cantonment having been abandoned in 1861. Considerable trade is carried on by rail and river. The manufactures include cotton cloth, skin-bottles, combs and horn-ware and sweetmeats.

The District of Etawah has an area of 1691 sq. m. It forms a purely artificial administrative division, stretching across the level plain of the Doab, and beyond the valley of the Jumna, to the gorges of the Chambal, and the last rocky outliers of the Vindhyan range. The district exhibits a striking variety of surface and scenery. The greater portion lies within the Doab or level alluvial plain between the Ganges and the Jumna. This part falls naturally into two sections, divided by the deep and fissured valley of the river Sengar. The tract to the north-east of that stream is rich and fertile, being watered by the Cawnpore and Etawah branches of the Ganges canal, and other important works. The south-western region has the same natural advantages, but possesses no great irrigation system, and is consequently less fruitful than the opposite slopes. Near the banks of the Jumna, the plain descends into the river valley by a series of wild ravines and terraces, inhabited only by a scattered race of hereditary herdsmen. Beyond the Jumna again a strip of British territory extends along the tangled gorges of the Chambal and the Kuari Nadi, far into the borders of the Gwalior state. This outlying tract embraces a series of rocky glens and mountain torrents, crowned by the ruins of native strongholds, and interspersed with narrow ledges of cultivable alluvium. The climate, once hot and sultry, has now become comparatively moist and equable under the influence of irrigation and the planting of trees.

Etawah was marked out by its physical features as a secure retreat for the turbulent tribes of the Upper Doab, and it was not till the 12th century that any of the existing castes settled on the soil. After the Mussulman conquests of Delhi and the surrounding country, the Hindus of Etawah appear to have held their own for many generations against the Mahommedan power; but in the 16th century Baber conquered the district, with the rest of the Doab, and it remained in the hands of the Moguls until the decay of their empire. After passing through the usual vicissitudes of Mahratta and Jat conquests during the long anarchy which preceded the British rule, Etawah was annexed by the wazir of Oudh in 1773. The wazir ceded it to the East India Company in 1801, but it still remained so largely in the hands of lawless native chiefs that some difficulty was experienced in reducing it to orderly government. During the mutiny of 1857 serious disturbances occurred in Etawah, and the district was occupied by the rebels from June to December; order was not completely restored till the end of 1858. In 1901 the population was 806,798, showing an increase of 11% in the decade. The district is partly watered by branches of the Ganges canal, and is traversed throughout by the main

line of the East Indian railway from Cawnpore to Agra. Cotton, oilseeds and other agricultural produce are exported, and some indigo is made, but manufacturing industry is slight.

ETCHING (Dutch, *etsen*, to eat), a form of engraving (*q.v.*) in which, in contradistinction to line engraving (*q.v.*), where the furrow is produced by the ploughing of the burin, the copper is eaten away or corroded by acid.

To prepare a plate for etching it is first covered with etching-ground, a composition which resists acid. The qualities of a ground are to be so adhesive that it will not quit the copper when a small quantity is left isolated between lines, yet not so adhesive that the etching point cannot easily and entirely remove it; at the same time a good ground will be hard enough to bear the hand upon it, or a sheet of paper, yet not so hard as to be brittle. The ground used by Abraham Bosse, the French painter and engraver (1602-1676) was composed as follows:—Melt 2 oz. of white wax; then add to it 1 oz. of gum-mastic in powder, a little at a time, stirring till the wax and the mastic are well mingled; then add, in the same manner, 1 oz. of bitumen in powder. There are three different ways of applying an etching-ground to a plate. The old-fashioned way was to wrap a ball of the ground in silk, heat the plate, and then rub the ball upon the surface, enough of the ground to cover the plate melting through the silk. To equalize the ground a dabber was used, which was made of cotton-wool under horsehair, the whole inclosed in silk. This method is still used by many artists, from tradition and habit, but it is far inferior in perfection and convenience to that which we will now describe. When the etching-ground is melted, add to it half its volume of essential oil of lavender, mix well, and allow the mixture to cool. You have now a paste which can be spread upon a cold plate with a roller; these rollers are covered with leather and made (very carefully) for the purpose. You first spread a little paste on a sheet of glass (if too thick, add more oil of lavender and mix with a palette knife), and roll it till the roller is quite equally charged all over, when the paste is easily transferred to the copper, which is afterwards gently heated to expel the oil of lavender. In both these methods of grounding a plate, the work is not completed until the ground has been smoked, which is effected as follows. The plate is held by a hand-vice if a small one, or if large, is fixed at some height, with the covered side downwards. A smoking torch, composed of many thin bees-wax dips twisted together, is then lighted and passed repeatedly under the plate in every direction, till the ground has incorporated enough lampblack to blacken it. The third way of covering a plate for etching is to apply the ground in solution as collodion is applied by photographers. The ground may be dissolved in chloroform, or in oil of lavender. The plate being grounded, its back and edges are protected from the acid by Japan varnish, which soon dries, and then the drawing is traced upon it. The best way of tracing a drawing is to use sheet gelatine, which is employed as follows. The gelatine is laid upon the drawing, which its transparence allows you to see perfectly, and you trace the lines by scratching the smooth surface with a sharp point. You then fill these scratches with fine black-lead, in powder, rubbing it in with the finger, turn the tracing with its face to the plate, and rub the back of it with a burnisher. The black-lead from the scratches adheres to the etching ground and shows upon it as pale grey, much more visible than anything else you can use for tracing. Then comes the work of the etching-needle, which is merely a piece of steel sharpened more or less. J.M.W. Turner used a prong of an old steel fork which did as well as anything, but neater etching-needles are sold by artists’ colour-makers. The needle removes the ground or cover and lays the copper bare. Some artists sharpen their needles so as to present a cutting edge which, when used sideways, scrapes away a broad line; and many etchers use needles of various degrees of sharpness to get thicker or thinner lines. It may be well to observe, in connexion with this part of the subject, that whilst thick lines agree perfectly well with the nature of woodcut, they are very apt to give an unpleasant heaviness to plate engraving of all kinds, whilst thin lines have generally a clear and agreeable appearance in plate engraving. Nevertheless, lines of moderate thickness are used effectively in etching when covered with finer shading, and very thick lines indeed were employed with good results by Turner when he intended to cover them with mezzotint (*q.v.*), and to print in brown ink, because their thickness was essential to prevent them from being overwhelmed by the mezzotint, and the brown ink made them print less heavily than black. Etchers differ in opinion as to whether the needle ought to scratch the copper or simply to glide upon its surface. A gliding needle is much more free, and therefore communicates a greater appearance of freedom to the etching, but it has the inconvenience that the etching-ground may not always be entirely removed, and then the lines may be defective from insufficient biting. A scratching needle, on the other hand, is free from this serious inconvenience, but it must not scratch irregularly so as to *engrave* lines of various depth. The *biting* in former times was generally done with a mixture of nitric acid and water, in equal proportions; but in the present day a Dutch mordant is a good deal used, which is composed as follows: Hydrochloric acid, 100 grammes; chlorate of potash, 20 grammes; water, 880 grammes. To make it, heat the water, add the chlorate of potash, wait till it is entirely dissolved, and then add the acid. The nitrous mordant acts rapidly and causes ebullition; the Dutch mordant acts slowly and causes no ebullition. The nitrous mordant widens the lines; the Dutch mordant bites in depth, and does not widen the lines to any perceptible degree. The time required for both depends upon temperature. A mordant bites slowly when cold, and more and more rapidly when heated. To obviate irregularity caused by difference of temperature, it is a good plan to

heat the Dutch mordant artificially to 95° Fahr. by lamps under the bath (for which a photographer's porcelain tray is most convenient), and keep it steadily to that temperature; the results may then be counted upon; but whatever the temperature fixed upon, the results will be regular if it is regular. To get different degrees of biting on the same plate the lines which are to be pale are "stopped out" by being painted over with Japan varnish or with etching ground dissolved in oil of lavender, the darkest lines being reserved to the last, as they have to bite longest. When the acid has done its work properly the lines are bitten in such various degrees of depth that they will print with the degree of blackness required; but if some parts of the subject require to be made paler, they can be lowered by rubbing them with charcoal and olive oil, and if they have to be made deeper they can be rebitten, or covered with added shading. Rebiting is done with the roller above mentioned, which is now charged very lightly with paste and rolled over the copper with no pressure but its own weight, so as to cover the smooth surface but not fill up any of the lines. The oil of lavender is then expelled as before by gently heating the plate, but it is not smoked. The lines which require rebiting may now be rebitten, and the others preserved against the action of the acid by stopping out. These are a few of the most essential technical points in etching, but there are many matters of detail for which the reader is referred to the special works on the subject.

There are many varieties in the processes of etching, and it is only necessary here to indicate the essential facts. A brief analysis of different styles may be given.

(1) *Pure Line.* As there is line engraving, so there is line etching; but as the etching-needle is a freer instrument than the burin, the line has qualities which differ widely from those of the burin line. Each of the two has its own charm and beauty; the liberty of the one is charming, and the restraint of the other is admirable also in its right place. In line etching, as in line engraving, the great masters purposely exhibit the line and do not hide it under too much shading. (2) *Line and Shade.* This answers exactly in etching to Mantegna's work in engraving. The most important lines are drawn first throughout, and the shade thrown over them like a wash with the brush over a pen sketch in indelible ink. (3) *Shade and Texture.* This is used chiefly to imitate oil-painting. Here the line (properly so called) is entirely abandoned, and the attention of the etcher is given to texture and chiaroscuro. He uses lines, of course, to express these, but does not exhibit them for their own beauty; on the contrary, he conceals them.

Of these three styles of etching the first is technically the easiest, and being also the most rapid, is adopted for sketching on the copper from nature; the second is the next in difficulty; and the third the most difficult, on account of the biting, which is never easy to manage when it becomes elaborate. The etcher has, however, many resources; he can make passages paler by burnishing them, or by using charcoal, or he can efface them entirely with the scraper and charcoal; he can darken them by rebiting or by regrounding the plate and adding fresh work; and he need not run the risk of biting the very palest passages of all, because these can be easily done with the *dry point*, which is simply a well-sharpened stylus used directly on the copper without the help of acid. It is often asserted that any one can etch who can draw, but this is a mistaken assertion likely to mislead. Without requiring so long an apprenticeship as the burin, etching is a very difficult art indeed, the two main causes of its difficulty being that the artist does not see his work properly as he proceeds, and that mistakes or misfortunes in the biting, which are of frequent occurrence to the inexperienced, may destroy all the relations of tone.

Etching, like line engraving, owed much to the old masters, but whereas, with the exception of Albert Dürer, the painters were seldom practical line engravers, they advanced etching not only by advice given to others but by the work of their own hands. Rembrandt did as much for etching as either Raphael or Rubens for line engraving; and in landscape the etchings of Claude had an influence which still continues, both Rembrandt and Claude being practical workmen in etching, and very skilful workmen. Ostade, Ruysdael, Berghem, Paul Potter, Karl Dujardin, etched as they painted, and so did a greater than any of them, Vandyck. In the earlier part of the 19th century etching was almost a defunct art, except as it was employed by engravers as a help to get faster through their work, of which "engraving" got all the credit, the public being unable to distinguish between etched lines and lines cut with the burin. But from the middle of the century dates a great revival of etching as an independent art, a revival which has extended all over Europe.

Apart from the copying of pictures by etching—which was found commercially preferable to the use of line engraving—a number of artists and amateurs gradually practised original etching with increasing success, notably Sir Seymour Haden, J.M. Whistler, Samuel Palmer and others in England, Felix Bracquemond, C.F. Daubigny, Charles Jacque, Adolphe Appian, Maxime Lalanne, Jules Jacquemart and others on the continent, besides that singular and remarkable genius, Charles Méryon. Etching clubs, or associations of artists for the publication of original etchings, were gradually founded in England, France, Germany and Belgium. Méryon and Whistler are two of the greatest modern etchers. Among earlier names mention may be made of Andrew Geddes (1783-1844) and of Sir David Wilkie (1785-1841). Geddes was the finer artist with the needle; he it was whom Rembrandt best inspired; his work was in the grand manner. Of the rich and rare dry-points "At Peckham Rye" and "At Halliford-on-Thames," the deepest and most brilliant master of landscape would have no need to be ashamed. David Wilkie's prints were, naturally, not less dramatic than his pictures, but the etcher's particular gift was possessed by him more intermittently: it is shown best in "The Receipt," a strong and vivid, dexterous sketch, quite full of character. J.S. Cotman's (1782-1842) etchings are also historically interesting though they were "soft ground" for the most part. They show

all his qualities of elegance and freedom as a draughtsman, and much of his large dignity in the distribution of light and shade. T. Girtin (1775-1802), in the preparations for his views of Paris, was notably happy. The work of Sir Francis Seymour Haden (b. 1818) had a powerful influence on the art in England. Between 1858 and 1879 Seymour Haden—the first president of the Royal Society of Painter Etchers—produced the vast majority of his plates, which have always good draughtsmanship, unity of effect and a personal impression. They show a strong feeling for nature. If, amongst some two hundred subjects, it were necessary to select one or two for peculiar praise, they might be the "Breaking up of the *Agamemnon*," the almost perfect "Water Meadow," the masterly presentment of "Erith Marshes," and the later dry-point of "Windmill Hill." Another great etcher—Frenchman by birth, but English by long residence—is Alphonse Legros (*q.v.*). Great in expression and suggestive draughtsmanship, austere and economical in line, Legros's work is the grave record of the observation and the fancy of an imaginative mind. In poetic portraiture nothing can well exceed his etched vision of G.F. Watts; "La Mort du Vagabond" is noticeable for terror and homely pathos; "Communion dans l'Église St Médard" is perhaps the best instance of the dignity, vigour and grave sympathy with which he addresses himself to ecclesiastical themes. Something of these latter qualities, in dealing with similar themes, Legros passed on to his pupil, Sir Charles Holroyd (b. 1861) —an etcher in the true vein; whilst an earlier pupil, prolific as himself, as imaginative, and sometimes more deliberately uncouth—William Strang, A.R.A. (b. 1859)—carried on in his own way the tradition of that part of Legros's practice, the preoccupation with the humble, for which Legros himself found certain warrant in a portion of the great *œuvre* of Rembrandt. Frank Short, A.R.A. (b. 1857), as with the very touch of Turner, carried to completion great designs that Turner left unfinished for the *Liber studiorum*. The delicacy of "Sleeping till the Flood," the curiously suggestive realism of "Wrought Nails"—a scene in the Black Country—entitle him to a lasting place in the list of the fine wielders of the etching-needle. D.Y. Cameron (b. 1865) betrays the influence of Rembrandt in a noble etching, "Border Towers," and the influence of Méryon in such a print as that of "The Palace, Stirling." His "London Set" is particularly fine. The individuality of C.J. Watson is less marked, but his skill, chiefly in architectural work, is noticeable. Admirers of the studiously accurate portraiture of a great monument may be able to set Watson's print of "St Étienne du Mont" by the side of Méryon's august and mysterious and ever-memorable vision. Paul Helleu (b. 1859) in his brilliant sketches, particularly of women, has used the art of etching in a peculiarly individual and delightful way. Among the numerous other modern etchers only a bare mention can be made of Oliver Hall, Minna Bolingbroke and Elizabeth Armstrong (Mrs Watson and Mrs Stanhope Forbes), Alfred East, Robert Macbeth, Walter Sickert, Robert Goff, Mortimer Menpes, Percy Thomas, Raven Hill, and Prof. H. von Herkomer, in England; in France, Roussel, J.F. Raffaëlli (b. 1850), Besnard and J.J.J. Tissot (1836-1902).

The oldest treatise on etching is that of Abraham Bosse (1645). See also P.G. Hamerton, *Etching and Etchers* (1868), and *Etchers' Handbook* (1881); F. Wedmore, *Etching in England* (1895); Singer and Strang, *Etching, Engraving, &c.* (1897).

ETEOCLES, in Greek legend, king of Thebes, son of Oedipus and Jocasta (Iocaste). After their father had been driven out of the country, he and his brother Polyneices agreed to reign alternately for a year. Eteocles, however, refused to keep the agreement, and Polyneices fled to Adrastus, king of Argos, whom he persuaded to undertake the famous expedition against Thebes on his behalf. The two brothers met in single combat, and both were slain. The Theban rulers decreed that only Eteocles should receive the honour of burial, but the decree was set at naught by Antigone (*q.v.*), the sister of Polyneices. The fate of Eteocles and Polyneices forms the subject of the *Seven against Thebes* of Aeschylus and the *Phoenissae* of Euripides.

ETESIAN WIND (Lat. *etesius*, annual; Gr. ἔτος, year), a Mediterranean wind blowing from the north and west in summer for about six weeks annually.

ÉTEX, ANTOINE (1808-1888), French sculptor, painter and architect, was born in Paris on the 20th of March 1808. He first exhibited in the salon of 1833, his work including a reproduction in marble of his "Death of Hyacinthus," and the plaster cast of his "Cain and his race cursed by God." Thiers, who was at this time minister of public works, now commissioned him to execute the two

groups of “Peace” and “War,” placed at each side of the Arc de Triomphe. This last, which established his reputation, he reproduced in marble in the salon of 1839. The French capital contains numerous examples of the sculptural works of Étex, which included mythological and religious subjects besides a great number of portraits. His paintings include the subjects of Eurydice and the martyrdom of Saint Sebastian, and among the best known of his architectural productions are the tomb of Napoleon I. in the Invalides and a monument of the revolution of 1848. Étex wrote a number of essays on subjects connected with the arts. The last year of his life was spent at Nice, and he died at Chaville (Seine-et-Oise) on the 14th of July 1888.

See P.E. Mangeant, *Antoine Étex, peintre, sculpteur et architecte, 1808-1888* (Paris, 1894).

ETHER, $(C_2H_5)_2O$, the *Aether* of pharmacy, a colourless, volatile, highly inflammable liquid, of specific gravity 0.736 at 0°, boiling-point 35° C., and freezing-point −117°.4 C. (K. Olszewski). It has a strong and characteristic odour, and a hot sweetish taste, is soluble in ten parts of water, and in all proportions in alcohol, and dissolves bromine, iodine, and, in small quantities, sulphur and phosphorus, also the volatile oils, most fatty and resinous substances, guncotton, caoutchouc and certain of the vegetable alkaloids. The vapour mixed with oxygen or air is violently explosive. The making of ether by the action of sulphuric acid on alcohol was known in about the 13th century; and later Basil Valentine and Valerius Cordus described its preparation and properties. The name ether appears to have been applied to the drug only since the times of Frobenius, who in 1730 termed it *spiritus aethereus or vini vitriolatus*. It was considered to be a sulphur compound, hence its name sulphur ether; this idea was proved to be erroneous by Valentine Rose in about 1800. Ether is manufactured by the distillation of 5 parts of 90% alcohol with 9 parts of concentrated sulphuric acid at a temperature of 140°-145° C., a constant stream of alcohol being caused to flow into the mixture during the operation. The distillate is purified by treatment with lime and calcium chloride, and subsequent distillation. The mechanism of this reaction was explained by A. Williamson in 1850. For other methods of preparation see Ethers.[1]

The presence of so small a quantity as 1% of alcohol may be detected in ether by the colour imparted to it by aniline violet; if water or acetic acid be present, the ether must be shaken with anhydrous potassium carbonate before the application of the test. When heated with zinc dust, it yields ethylene and water. Chromic acid oxidizes it to acetic acid and ozone oxidizes it to ethyl peroxide. In contact with hydriodic acid gas at 0° C., it forms ethyl iodide (R.D. Silva, *Ber.*, 1875, 8, p. 903), and with water and a little sulphuric acid at 180° C., it yields alcohol (E. Erlenmeyer, *Zeit. f. chemie*, 1868, p. 343). It forms crystalline compounds with bromine and with many metallic salts.

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Medicine.—For the anaesthetic properties of ether see Anaesthesia. Applied externally, ether evaporates very rapidly, producing such intense cold as to cause marked local anaesthesia. For this purpose it is best applied as a fine spray, but ethyl chloride is generally found more efficient and produces less subsequent discomfort. It aids the absorption of fats and may be used with cod liver oil when the latter is administered by the skin. If it be rubbed in or evaporation be prevented, it acts, like alcohol and chloroform, as an irritant. Ten to twenty minims of ether, subcutaneously injected, constitute perhaps the most rapid and powerful cardiac stimulant known, and are often employed for this purpose in cases of syncope under anaesthesia. Taken internally, ether acts in many respects similarly to alcohol and chloroform, but its stimulant action on the heart is much more marked, being exerted both reflexly from the stomach and directly after its rapid absorption. Ether is thus the type of a rapidly diffusible stimulant. It is also useful in relieving the paroxysms of asthma. The dose for repeated administration is from 10 to 30 minims and for a single administration up to a drachm.

Chronic Poisoning.—A dose of a little more than a drachm (a teaspoonful) will produce a condition of inebriation lasting for one-half to one hour, but the dose must soon be greatly increased. The after-effects are, if anything, rather pleasant, and the habit of ether drinking is certainly not so injurious as alcoholism. The principal symptoms symptons of chronic ether-drinking are a weakening of the activity of the special senses, and notably sight and hearing, a lowering of the intelligence and a degree of general paresis (partial paralysis) of motion.

1 See also J. v. Liebig, *Ann. Chem. Pharm.*, 1837, 23, p. 39; 1839, 30, p. 129; E. Mitscherlich, *Pogg. Ann.*, 1836, 31, p. 273; 1841, 53, p. 95; A.W. Williamson, *Phil. Mag.*, 1850 (3), 37, p. 350.

ETHEREDGE [or Etherege], **SIR GEORGE** (*c.* 1635-1691), English dramatist, was born about the year 1635, and belonged to an Oxfordshire family. He is said to have been educated at Cambridge, but Dennis assures us that “to his certain knowledge he understood neither Greek nor Latin.” He

travelled abroad early, and seems to have resided in France. It is possible that he witnessed in Paris the performances of some of Molière's earliest comedies; and he seems, from an allusion in one of his plays, to have been personally acquainted with Bussy Rabutin. On his return to London he studied the law at one of the Inns of Court. His tastes were those of a fine gentleman, and he indulged freely in pleasure.

Sometime soon after the Restoration he composed his comedy of *The Comical Revenge* or *Love in a Tub*, which introduced him to Lord Buckhurst, afterwards the earl of Dorset. This was brought out at the Duke's theatre in 1664, and a few copies were printed in the same year. It is partly in rhymed heroic verse, like the stilted tragedies of the Howards and Killigrews, but it contains comic scenes that are exceedingly bright and fresh. The sparring between Sir Frederick and the Widow introduced a style of wit hitherto unknown upon the English stage. The success of this play was very great, but Etheredge waited four years before he repeated his experiment. Meanwhile he gained the highest reputation as a poetical beau, and moved in the circle of Sir Charles Sedley, Lord Rochester and the other noble wits of the day. In 1668 he brought out *She would if she could*, a comedy in many respects admirable, full of action, wit and spirit, although to the last degree frivolous and immoral. But in this play Etheredge first shows himself a new power in literature; he has nothing of the rudeness of his predecessors or the grossness of his contemporaries. We move in an airy and fantastic world, where flirtation is the only serious business of life. At this time Etheredge was living a life no less frivolous and unprincipled than those of his Courtals and Freemans. He formed an alliance with the famous actress Mrs Elizabeth Barry; she bore him a daughter, on whom he settled £6000, but who, unhappily, died in her youth. His wealth and wit, the distinction and charm of his manners, won Etheredge the general worship of society, and his temperament is best known by the names his contemporaries gave him, of "gentle George" and "easy Etheredge." Rochester upbraided him for inattention to literature; and at last, after a silence of eight years, he came forward with one more play, unfortunately his last. *The Man of Mode or Sir Fopling Flutter*, indisputably the best comedy of intrigue written in England before the days of Congreve, was acted and printed in 1676, and enjoyed an unbounded success. Besides the merit of its plot and wit, it had the personal charm of being supposed to satirize, or at least to paint, persons well known in London. Sir Fopling Flutter was a portrait of Beau Hewit, the reigning exquisite of the hour; in Dorimant the poet drew the earl of Rochester, and in Medley a portrait of himself; while even the drunken shoemaker was a real character, who made his fortune from being thus brought into public notice. After this brilliant success Etheredge retired from literature; his gallantries and his gambling in a few years deprived him of his fortune, and he looked about for a rich match. He was knighted before 1680, and gained the hand and the money of a rich widow. He was sent by Charles II. on a mission to the Hague, and in March 1685 was appointed resident minister in the imperial German court at Regensburg. He was very uncomfortable in Germany, and after three and a half years' residence left for Paris. He had collected a library at Regensburg, some volumes of which are in the theological college there. His MS. despatches are preserved in the British Museum, where they were discovered and described by Mr Gosse in 1881; they add very largely to our knowledge of Etheredge's career. He died in Paris, probably in 1691, for Narcissus Luttrell notes in February 1692 that "Sir George Etherege, the late King James' ambassador to Vienna, died lately in Paris."

Etheredge deserves to hold a more distinguished place in English literature than has generally been allotted to him. In a dull and heavy age, he inaugurated a period of genuine wit and sprightliness. He invented the comedy of intrigue, and led the way for the masterpieces of Congreve and Sheridan. Before his time the manner of Ben Jonson had prevailed in comedy, and traditional "humours" and typical eccentricities, instead of real characters, had crowded the comic stage. Etheredge paints with a light, faint hand, but it is from nature, and his portraits of fops and beaux are simply unexcelled. No one knows better than he how to present a gay young gentleman, a Dorimant, "an unconfinable rover after amorous adventures." His genius is as light as thistle-down; he is frivolous, without force of conviction, without principle; but his wit is very sparkling, and his style pure and singularly picturesque. No one approaches Etheredge in delicate touches of dress, furniture and scene; he makes the fine airs of London gentlemen and ladies live before our eyes even more vividly than Congreve does; but he has less insight and less energy than Congreve. Had he been poor or ambitious, he might have been to England almost what Molière was to France, but he was a rich man living at his ease, and he disdained to excel in literature. Etheredge was "a fair, slender, genteel man, but spoiled his countenance with drinking." His contemporaries all agree in acknowledging that he was the soul of affability and sprightly good-nature.

The life of Etheredge was first given in detail by Edmund Gosse in *Seventeenth Century Studies* (1883). His works were edited by A.W. Verity, in 1888.

(E. G.)

ETHERIDGE, JOHN WESLEY (1804-1866), English nonconformist divine, was born near Newport, Isle of Wight, on the 24th of February 1804. He received most of his early education from his father. Though he never attended any university he acquired ultimately a thorough knowledge of

Greek, Latin, Hebrew, Syriac, French and German. In 1824 he was placed on the Wesleyan Methodist plan as a local preacher. In 1826 his offer to enter the ministry was accepted, and after the usual probationary trial he was received into full connexion at the conference of 1831. For two years after this he remained at Brighton, and in 1833 he removed to Cornwall, being stationed successively at the Truro and Falmouth circuits. From Falmouth he removed to Darlaston, where in 1838 his health gave way. For a good many years he was a supernumerary, and lived for a while at Caen and Paris, where in the public libraries he found great facilities for prosecuting his favourite Oriental studies. His health having considerably improved, he became, in 1843, pastor of the Methodist church at Boulogne. He returned to England in 1847, and was appointed successively to the circuits of Islington, Bristol, Leeds, Penzance, Penryn, Truro and St Austell in east Cornwall. Shortly after his return to England he received the degree of Ph.D. from the university of Heidelberg. He was a patient, modest, hard-working and accurate scholar. He died at Camborne on the 24th of May 1866.

His principal works are *Horae Aramaicae* (1843); *History, Liturgies and Literature of the Syrian Churches* (1847); *The Apostolic Acts and Epistles, from the Peshito or Ancient Syriac* (1849); *Jerusalem and Tiberias, a Survey of the Religious and Scholastic Learning of the Jews* (1856); *The Targums of Onkelos and Jonathan ben Uzziel* (1st vol. in 1862, 2nd in 1865). See *Memoir*, by Rev. Thornley Smith (1871).

ETHERIDGE, ROBERT (1819-1903), English geologist and palaeontologist, was born at Ross, in Herefordshire, on the 3rd of December 1819. After an ordinary school education in his native town, he obtained employment in a business house in Bristol. There he devoted his spare time to natural history pursuits, and in 1850 was appointed curator of the museum attached to the Bristol Philosophical Institution. He also became lecturer on botany in the Bristol medical school. In 1857, through the influence of Sir Roderick I. Murchison, he was appointed to a post in the Museum of Practical Geology in London, and eventually became palaeontologist to the Geological Survey. In 1865 he assisted Prof. Huxley in the preparation of a *Catalogue of Fossils in the Museum of Practical Geology*. His chief work for many years was in naming the fossils collected during the progress of the Geological Survey, and in supplying the lists that were appended to numerous official memoirs. In this way he acquired an exceptional knowledge of British fossils, and he ultimately prepared an elaborate work entitled *Fossils of the British Islands, Stratigraphically and Zoologically arranged*. Only the first volume dealing with the Palaeozoic species was published (1888). Etheridge also was author of several papers on the Rhaetic Beds, and of an important essay on the Physical Structure of North Devon, and on the Palaeontological Value of the Devonian Fossils (1867). He edited, and in the main rewrote, the second part of a new edition of John Phillips' Manual of Geology—entitled *Stratigraphical Geology and Palaeontology* (1885). He was elected F.R.S. in 1871, and was president of the Geological Society in 1881-1882. In 1881 Etheridge was transferred from the Geological Survey to the geological department of the British Museum, where he served as assistant keeper until 1891. He died at Chelsea, London, on the 18th of December 1903.

Memoir by Dr Henry Woodward (with list of works and portrait) in *Geological Magazine*, January 1904; also Memoir by H.B. Woodward (with portrait) in *Proc. Bristol Nat. Soc.* x. 175.

ETHERS, in organic chemistry, compounds of the general formula R·O·R′, where R, R′ = alkyl or aryl groups. They may be regarded as the anhydrides of the alcohols, being formed by elimination of one molecule of water from two molecules of the alcohols; those in which the two hydrocarbon radicals are similar are known as *simple* ethers, and those in which they are dissimilar as *mixed* ethers. They may be prepared by the action of concentrated sulphuric acid on the alcohols, alkyl sulphuric acids being first formed, which yield ethers on heating with alcohols. The process may be made a continuous one by running a thin stream of alcohol continually into the heated reaction mixture of alcohol and sulphuric acid. Benzene sulphonic acid has been used in place of sulphuric acid (F. Krafft, *Ber.*, 1893, 26, p. 2829). A.W. Williamson (*Ann.*, 1851, 77, p. 38; 1852, 81, p. 77) prepared ether by the action of sodium ethylate on ethyl iodide, and showed that all ethers must possess the structural formula given above (see also *Brit. Assoc. Reports*, 1850, p. 65). They may also be prepared by heating the alkyl halides with silver oxide.

The ethers are neutral volatile liquids (the first member, methyl ether, is a gas at ordinary temperature). Phosphorus pentachloride converts them into alkyl chlorides, a similar decomposition taking place when they are heated with the haloid acids. Nitric acid and chromic acid oxidize them in such a mariner that they yield the same products as the alcohols from which they are derived. With chlorine they yield substitution products.

Methyl ether, $(CH_3)_2O$, was first prepared by J. B. Dumas and E. Péligot (*Ann. chim. phys.*, 1835, [2]

58, p. 19) by heating methyl alcohol with sulphuric acid. It is best prepared by heating methyl alcohol and sulphuric acid to 140° C. and leading the evolved gas into sulphuric acid. The sulphuric acid solution is then allowed to drop slowly into an equal volume of water, when the methyl ether is liberated (E. Erlenmeyer and A. Kriechbaumer, *Ber.*, 1874, 7, p. 699). It is a pleasant-smelling gas, which burns when ignited, and may be condensed to a liquid which boils at 23.6º C. It is somewhat soluble in water and readily soluble in alcohol, and concentrated sulphuric acid. It combines with hydrochloric acid gas to form a compound $(CH_3)_2O{\cdot}HCl$ (C. Friedel, *Comptes rendus*, 1875, 81, p. 152). *Methyl ethyl ether*, $CH_3{\cdot}O{\cdot}C_2H_5$, is prepared from methyl iodide and sodium ethylate, or from ethyl iodide and sodium methylate (A. W. Williamson, *Ann.*, 1852, 81, p. 77). It is a liquid which boils at 10.8º C.

For diethyl ether see ETHER, and for methyl phenyl ether (anisole) and ethyl phenyl ether (phenetole) see CARBOLIC ACID.

ETHICS, the name generally given to the science of moral philosophy. The word “ethics” is derived from the Gr. ἠθικός, that which pertains to ἦθος, character.

For convenience in reference, the arrangement followed in this article may be explained at the outset:—

Section I. contains a general survey of the subject; it shows in what sense ethics is to be regarded as a special field of philosophical investigation—its relations to other departments of thought, especially to psychology, religion and modern physical science. The article makes no attempt to give a detailed, casuistical examination of the matter of ethical theory. For this, reference must be made to special articles on philosophic schools, writers and terms.

Section II. is a historical sketch in four parts tracing the main lines of development in ethical speculation from its birth to the present day. Here again it has been possible to notice only the salient points or landmarks, leaving all detail to special articles as above. All important writers whose names occur in this sketch are treated in special biographical articles, and references are given as often as possible to supplementary articles which illustrate and explain points which cannot be fully treated here. This is especially the case in connexion with technical terms (whose history and meaning are inevitably taken for granted) and biographical information about minor ethical writers.

I. Definition and Subject-Matter of Ethics

In its widest sense, the term “ethics” would imply an examination into the general character or habits of mankind, and would even involve a description or history of the habits of men in particular societies living at different periods of time. Such a field of study would obviously be too wide for any particular science or philosophy to investigate, and moreover portions of the field are already occupied by history, by anthropology and by the particular sciences (*e.g.* physiology, anatomy, biology), in so far as the habits and character of men depend upon the material processes which these sciences examine. Even philosophies such as logic and aesthetic would be necessary for such an investigation, if thought and artistic production are normal human habits and elements in character. Ethics then is usually confined to the particular field of human character and conduct so far as they depend upon or exhibit certain general principles commonly known as moral principles. Men in general characterize their own conduct and character and that of other men by such general adjectives as good, bad, right and wrong, and it is the meaning and scope of these adjectives, primarily in relation to human conduct, and ultimately in their final and absolute sense, that ethics investigates.

A not uncommon definition of ethics as the “science of conduct” is inexact for various reasons. (1) The sciences are descriptive or experimental. But a description of what acts or what ends of action men in the present or the past call, or have called, “good” or “bad” is clearly beyond human powers. And experiments in morality (apart from the inconvenient practical consequences likely to ensue) are useless for purposes of ethics, because the moral consciousness would itself at one and the same time be required to make the experiment and to provide the subject upon which the experiment is performed. (2) Ethics is a philosophy and not a science. Philosophy is a process of reflection upon the presuppositions involved in unreflective thought. In logic and metaphysics it investigates either the process of apprehension itself, or conceptions such as cause, substance, space, time, which the ordinary scientific consciousness never criticizes. In moral philosophy the place of the body of sciences, which philosophy as the theory of knowledge investigates, is taken by the developed moral consciousness, which already pronounces moral judgment without hesitation, and claims authority to subject to continual criticism the institutions and forms of social life which it has itself helped to create.

When ethical speculation first begins, conceptions such as those of duty, responsibility, the will as the ultimate subject of moral approbation and disapprobation, are already in existence and already operative. Moral philosophy in a certain sense adds nothing to these conceptions, though it sets them in a clearer light. The problems of the moral consciousness at the time at which it first becomes reflective are not strictly speaking philosophical problems at all. It is occupied with just such questions as each individual man who wishes to act rightly is constantly called upon to answer, *e.g.* questions such as “What particular action will meet the claims of justice under such and such circumstances?” or “What degree of ignorance will excuse this particular person in this particular case from his responsibility?” It tries to attain a knowledge as complete as possible of the circumstances under which the act contemplated must be performed, the personalities of the persons whom it may affect, and the consequences (so far as they can be foreseen) which it will produce, and then by virtue of its own power of moral discrimination pronounces judgment. And the ever-recurring problem of the moral consciousness, “What ought to be done?” is one which receives a clearer and more definite answer as men become more able in the course of moral experience to apply those principles of the moral consciousness which are yet employed in that experience from the outset. Nevertheless there is a sense in which moral philosophy may be said to originate out of difficulties inherent in the nature of morality itself, although it remains true that the questions which ethics attempts to answer are never questions with which the moral consciousness as such is confronted. The fact that men give different answers to moral problems which seem similar in character, or even the mere fact that men disregard, when they act immorally, the dictates and implicit principles of the

moral consciousness is certain sooner or later to produce the desire either, on the one hand, to justify immoral action by casting doubt upon the authority of the moral consciousness and the validity of its principles, or, on the other hand, to justify particular moral judgments either by (the only valid method) an analysis of the moral principle involved in the judgment and a demonstration of its universal acceptation, or by some attempted proof that the particular moral judgment is arrived at by a process of inference from some universal conception of the Supreme Good or the Final End from which all particular duties or virtues may be deduced. It may be that criticism of morality first originates with a criticism of existing moral institutions or codes of ethics; such a criticism may be due to the spontaneous activity of the moral consciousness itself. But when such criticism passes into the attempt to find a universal criterion of morality—such an attempt being in effect an effort to make morality scientific—and especially when the attempt is seen, as it must in the end be seen, to fail (the moral consciousness being superior to all standards of morality and realizing itself wholly in particular judgments), then ethics as a *process of reflection* upon the nature of the moral consciousness may be said to begin. If this be true it follows that one of the chief function of ethics must be criticism of mistaken attempts to find a criterion of morality superior to the pronouncements of the moral consciousness itself. The ultimate superiority of the moral consciousness over all other standards is recognized, even by those who impugn its authority, whenever they claim that all men ought to recognize the superior value of the standards which they themselves wish to substitute. Similarly, their opponents refute their arguments by showing that they are based ultimately upon a recognition of certain distinctions which are moral distinctions (*i.e.* imply a moral consciousness capable of discriminating between right and wrong in particular cases), and that these moral distinctions conflict with the conclusions which they reach.

This may briefly be illustrated by reference to some of the great fundamental controversies of ethics. None of these originates out of conflicting statements of the moral consciousness, *i.e.* there is no fundamental contradiction in morality itself. No one (if unsophisticated) ever confused the conception of pleasure with the conception of the Good, or thought that the claims of selfish interest were identical with those of duty. But the controversy between hedonists and anti-hedonists originates as soon as men reflect that a good which is not in some sense “my” good is not good at all, or that no act can be said to be moral which does not satisfy “me.” Or, again, the reflection that the mark or sign of the perfect performance of a particular virtuous act or function is the presence of a characteristic pleasure which always accompanies it, is opposed to the reflection that it is a mark of the highest morality never to rest satisfied, and out of these seemingly contradictory statements of the reflective consciousness might arise a multitude of controversies either concerning pleasure and duty, or the even more difficult and complex conceptions of merit, progress, and the nature of the Supreme Good or Final End.

The Sciences.

When and how fresh controversies in ethics will begin it would be impossible for any one to foretell. Sometimes the dominance of a particular science or branch of study is the occasion of an attempt to apply to ethics ideas borrowed from or analogous to the conceptions of that science. False analogies drawn between ethics and mathematics or between morality and the perception of beauty have wrought much mischief in modern and to some degree even in ancient ethics. The influence of ideas borrowed from biology is everywhere manifest in the ethical speculations of modern times. Sometimes, again, whole theories of ethics have been formulated which can be seen in the end to be efforts to subordinate moral conceptions to conceptions belonging properly to institutions or departments of human thought and activity which the moral consciousness has itself originated. Law, for instance, depends, or at least ought to depend, upon men’s need for and consciousness of justice. And such institutions as the family and the state are created by the social consciousness, which is the moral consciousness from another aspect. Yet morality has been subordinated to legal and social sanctions, and moral advance has been held to be conditioned by political and social necessities which are not moral needs. Similarly no one since civilization emerged from barbarism has ever really been willing to yield allegiance to a deity who is not moral in the fullest and highest sense of the word. God is not superior to moral law. Yet there have been whole systems of theological ethics which have attempted to base human morality upon the arbitrary will of God or upon the supreme authority of a divinely inspired book or code of laws. One of the greatest of all ethical controversies, that concerning the freedom of the will, arose directly out of what was in reality a theological problem—the necessity, namely, of reconciling God’s foreknowledge with human freedom. The unreflective moral consciousness never finds it difficult to distinguish between a man’s power of willing and all the forces of circumstance, heredity and the like, which combine to form the temptations to which he may yield or bid defiance; and such facts as “remorse” and “penitence” are a continual testimony to man’s sense of freedom. But so soon as men perceive upon reflection an apparent discrepancy between the utterances of their moral consciousness and certain conclusions to which theological speculation (or at a later period metaphysical and scientific inquiries) seems inevitably to lead them, they will not rest satisfied until the belief in the will’s freedom (hitherto unquestioned) is upon further reflection justified or condemned. It is clear then that the complexity of the subject-matter of ethics is such that no sharply defined boundary lines can be drawn between it and other branches of inquiry. Just in so far as it presupposes the apprehension of moral facts, it must presuppose a knowledge of the system of social relationships upon which some at least of those facts depend. No one, for instance, could inquire into the nature of justice without being further compelled to undertake an examination of the nature of the state.

Theology.

It would be difficult to decide how much of the dispute between the advocates of pleasure theories and their opponents turns upon vexed questions of psychology, and how much is strictly relevant to ethics. If, as has already been said, one of the chief tasks of ethics is to prevent the intrusion into its own sphere of inquiry of ideas borrowed from other and alien sources, then obviously these sources must be investigated. One example of this necessity may be given. It is sometimes maintained that the proper method of ethics is the psychological method; ethics, we are told, should examine as its subject-matter moral sentiments wherever found, without raising ultimate questions as to the nature of obligation or moral authority in general. Now if in opposition to such arguments the ultimate character of moral obligation be defended, it will be necessary to point out that no one feels moral sentiments except in connexion with particular objects of moral approbation or disapprobation (*e.g.* gratitude is inexplicable apart from a particular relationship existing between two or more persons), and that these objects are objects of the moral consciousness alone. But such a line of argument is certain to make necessary an inquiry into the nature of the objects of psychological study which may produce quite unforeseen results for psychology.

Psychology.

Nothing therefore is to be gained by confining ethics within limits which must from the nature of the case be arbitrary. The defender at all events of the supremacy of moral intuitions must be prepared to follow whither the argument leads, into whatever strange quarters it may direct him. But this much may be said by way of delimitation of the scope of ethics: however complicated and involved its arguments and processes of inference may become, the facts from which they start and the conclusions to which they point are such as the moral consciousness alone can understand or warrant.

(H. H. W.)

II. Historical Sketch

A. *Greek and Graeco-Roman Ethics*.—The ethical speculation of Greece, and therefore of Europe, had no abrupt and absolute beginning. The naive and fragmentary precepts of conduct, which are everywhere the earliest manifestation of nascent moral reflection, are a noteworthy element in the gnomic poetry of the 7th and 6th centuries B.C. Their importance is shown by the traditional enumeration of the Seven Sages of the 6th century, and their influence on ethical thought is attested by the references of Plato and Aristotle. But from these unscientific utterances to a philosophy of morals was a long process. In the practical wisdom of Thales (*q.v.*), one of the seven, we cannot discern any systematic theory of morality. In the case of Pythagoras, conspicuous among pre-Socratic philosophers as the founder not merely of a school, but of a sect or order bound by a common rule of life, there is a closer connexion between moral and metaphysical speculation. The doctrine of the Pythagoreans that the essence of justice (conceived as equal retribution) was a square number, indicates a serious attempt to extend to the region of conduct their mathematical view of the universe; and the same may be said of their classification of good with unity, straightness and the like, and of evil with the opposite qualities. Still, the enunciation of the moral precepts of Pythagoras appears to have been dogmatic, or even prophetic, rather than philosophic, and to have been accepted by his disciples with an unphilosophic reverence as the *ipse dixit*[1] of the master. Hence, whatever influence the Pythagorean blending of ethical and mathematical notions may have had on Plato, and, through him, on later thought, we cannot regard the school as having really forestalled the Socratic inquiry after a completely reasoned theory of conduct. The ethical element in the “dark” philosophizing of Heraclitus (*c.* 530-470 B.C.), though it anticipates Stoicism in its conceptions of a law of the universe, to which the wise man will carefully conform, and a divine harmony, in the recognition of which he will find his truest satisfaction, is more profound, but even less systematic. It is only when we come to Democritus, a contemporary of Socrates, the last of the original thinkers whom we distinguish as pre-Socratic, that we find anything which we can call an ethical system. The fragments that remain of the moral treatises of Democritus are sufficient, perhaps, to convince us that the turn of Greek philosophy in the direction of conduct, which was actually due to Socrates, would have taken place without him, though in a less decided manner; but when we compare the Democritean ethics with the post-Socratic system to which it has most affinity, Epicureanism, we find that it exhibits a very rudimentary apprehension of the formal conditions which moral teaching must fulfil before it can lay claim to be treated as scientific.

The truth is that no system of ethics could be constructed until attention had been directed to the vagueness and inconsistency of the common moral opinions of mankind. For this purpose was needed the concentration of a philosophic intellect of the first order on the problems of practice. In Socrates first we find the required combination of a paramount interest in conduct and an ardent desire for knowledge. The pre-Socratic thinkers were all primarily devoted to ontological research; but by the middle of the 5th century B.C. the conflict of their dogmatic systems had led some of the keenest minds to doubt the possibility of penetrating the secret of the physical universe. This doubt found expression in the reasoned scepticism of Gorgias, and produced the famous proposition of Protagoras, that human apprehension is the only standard of existence. The same feeling led Socrates to abandon the old physico-metaphysical inquiries. In his ease, moreover, it was strengthened by a naive piety that forbade him to search into things of which the gods seemed to have reserved the knowledge to themselves. The regulation of human action, on the other hand (except on occasions of special difficulty, for which omens and oracles might be vouchsafed), they had left to human reason.

On this accordingly Socrates concentrated his efforts.

Though, however, Socrates was the first to arrive at a proper conception of the problems of conduct, the general idea did not originate with him. The natural reaction against the metaphysical and ethical dogmatism of the early thinkers had reached its climax in the Sophists (*q.v.*). Gorgias and Protagoras are only representatives of what was really a universal tendency to abandon dogmatic theory and take refuge in practical matters, and especially, as was natural in the Greek city-state, in the civic relations of the citizen. The education given by the Sophists aimed at no general theory of life, but professed to expound the art of getting on in the world and of managing public affairs. In their eulogy of the virtues of the citizen, they pointed out the prudential character of justice and the like as a means of obtaining pleasure and avoiding pain. The Greek conception of society was such that the life of the free-born citizen consisted mainly of his public function, and, therefore, the pseudo-ethical disquisitions of the Sophists satisfied the requirements of the age. None thought of ἀρετή (virtue or excellence) as a unique quality possessed of an intrinsic value, but as the virtue of the citizen, just as good flute-playing was the virtue of the flute-player. We see here, as in other activities of the age, a determination to acquire technical knowledge, and to apply it directly to the practical issue; just as music was being enriched by new technical knowledge, architecture by modern theories of plans and T-squares (*sc.* Hippodamus), the handling of soldiers by the new technique of "tactics" and "hoplitics," so citizenship must be analysed afresh, systematized and adapted in relation to modern requirements. The Sophists had studied these matters superficially indeed but with thoroughness as far as they went, and it is not remarkable that they should have taken the methods which were successful in rhetoric, and applied them to the "science and art" of civic virtues. Plato's *Protagoras* claims, not unjustly, that in teaching virtue they simply did systematically what every one else was doing at haphazard. But in the true sense of the word, they had no ethical system at all, nor did they contribute save by contrast to ethical speculation. They merely analysed conventional formulae, much in the manner of certain modern so-called "scientific" moralists. Into this arena of hazy popular common sense Socrates brought a new critical spirit, showing that these popular lecturers, in spite of their fertile eloquence, could not defend their fundamental assumptions, nor even give rational definitions of what they professed to explain. Not only were they thus "ignorant," but they were also perpetually inconsistent with themselves in dealing with particular instances. Thus, by the aid of his famous "dialectic," Socrates arrived first at the negative result that the professed teachers of the people were as ignorant as he himself claimed to be, and in a measure justified the eulogy of Aristotle that he rendered to philosophy the service of "introducing induction and definitions." This description of his work is, however, both too technical and too positive, if we may judge from those earlier dialogues of Plato in which the real Socrates is found least modified. The pre-eminent wisdom which the Delphic oracle attributed to him was held by himself to consist in a unique consciousness of ignorance. Yet it is equally clear from Plato that there was a most important positive element in the teaching of Socrates in virtue of which it is just to say with Alexander Bain, "the first important name in ancient ethical philosophy is Socrates." The union of the negative and the positive elements in his work has caused historians no little perplexity, and we cannot quite save the philosopher's consistency unless we regard some of the doctrines attributed to him by Xenophon as merely tentative and provisional. Still the positions of Socrates that are most important in the history of ethical thought not only are easy to harmonize with his conviction of ignorance, but even render it easier to understand his unwearied cross-examination of common opinion. While he showed clearly the difficulty of acquiring knowledge, he was convinced that knowledge alone could be the source of a coherent system of virtue, as error of evil. Socrates, therefore, first in the history of thought, propounds a positive scientific law of conduct. Virtue is knowledge. This principle involved the paradox that no man, knowing good, would do evil. But it was a paradox derived from his unanswerable truisms, "Every one wishes for his own good, and would get it if he could," and "No one would deny that justice and virtue generally are goods, and of all goods the best." All virtues are, therefore, summed up in knowledge of the good. But this good is not, for Socrates, duty as distinct from interest. The force of the paradox depends upon a blending of duty and interest in the single notion of good, a blending which was dominant in the common thought of the age. This it is which forms the kernel of the positive thought of Socrates according to Xenophon. He could give no satisfactory account of Good in the abstract, and evaded all questions on this point by saying that he knew "no good that was not good *for something in particular*," but that good is consistent with itself. For himself he prized above all things the wisdom that is virtue, and in the task of producing it he endured the hardest penury, maintaining that such life was richer in enjoyment than a life of luxury. This many-sidedness of view is illustrated by the curious blending of noble and merely utilitarian sentiment in his account of friendship: a friend who can be of no service is valueless; yet the highest service that a friend can render is moral improvement.

The Sophists.

Socrates.

The historically important characteristics of his moral philosophy, if we take (as we must) his teaching and character together, may be summarized as follows:—(1) an ardent inquiry for knowledge nowhere to be found, but which, if found, would perfect human conduct; (2) a demand meanwhile that men should act as far as possible on some consistent theory; (3) a provisional adhesion to the commonly received view of good, in all its incoherent complexity, and a perpetual readiness to maintain the harmony of its different elements, and demonstrate the superiority of virtue by an appeal to the standard of self-interest; (4) personal firmness, as apparently easy as it was actually invincible, in carrying out consistently such practical convictions as he had attained. It is only when we keep all these points in view that we can understand how from the spring of Socratic

conversation flowed the divergent streams of Greek ethical thought.

The Socratic Schools.

Four distinct philosophical schools trace their immediate origin to the circle that gathered round Socrates—the Megarian, the Platonic, the Cynic and the Cyrenaic. The impress of the master is manifest on all, in spite of the wide differences that divide them; they all agree in holding the most important possession of man to be wisdom or knowledge, and the most important knowledge to be knowledge of Good. Here, however, the agreement ends. The more philosophic part of the circle, forming a group in which Euclid of Megara (see Megarian School) seems at first to have taken the lead, regarded this Good as the object of a still unfulfilled quest, and were led to identify it with the hidden secret of the universe, and thus to pass from ethics to metaphysics. Others again, whose demand for knowledge was more easily satisfied, and who were more impressed with the positive and practical side of the master's teaching, made the quest a much simpler affair. They took the Good as already known, and held philosophy to consist in the steady application of this knowledge to conduct. Among these were Antisthenes the Cynic and Aristippus of Cyrene. It is by their recognition of the duty of living consistently by theory instead of mere impulse or custom, their sense of the new value given to life through this rationalization, and their effort to maintain the easy, calm, unwavering firmness of the Socratic temper, that we recognize both Antisthenes and Aristippus as "Socratic men," in spite of the completeness with which they divided their master's positive doctrine into systems diametrically opposed. Of their contrasted principles we may perhaps say that, while Aristippus took the most obvious logical step for reducing the teaching of Socrates to clear dogmatic unity, Antisthenes certainly drew the most natural inference from the Socratic life.

Aristippus.

Aristippus (see Cyrenaics) argued that, if all that is beautiful or admirable in conduct has this quality as being useful, *i.e.* productive of some further good; if virtuous action is essentially action done with insight, or rational apprehension of the act as a means to this good, this good must be pleasure. Bodily pleasures and pains Aristippus held to be the keenest, though he does not seem to have maintained this on any materialistic theory, as he admitted the existence of purely mental pleasures, such as joy in the prosperity of one's native land. He fully recognized that his good was capable of being realized only in successive parts, and gave even exaggerated emphasis to the rule of seeking the pleasure of the moment, and not troubling oneself about a dubious future. It was in the calm, resolute, skilful culling of such pleasures as circumstances afforded from moment to moment, undisturbed by passion, prejudices or superstition, that he conceived the quality of wisdom to be exhibited; and tradition represents him as realizing this ideal to an impressive degree. Among the prejudices from which the wise man was free he included all regard to customary morality beyond what was due to the actual penalties attached to its violation; though he held, with Socrates, that these penalties actually render conformity reasonable. Thus early in the history of ethical theory appeared the most thorough-going exposition of hedonism.

The Cynics.

Far otherwise was the Socratic spirit understood by Antisthenes and the Cynics (*q.v.*). They equally held that no speculative research was needed for the discovery of good and virtue, and maintained that the Socratic wisdom was exhibited, not in the skilful pursuit, but in the rational disregard of pleasure,—in the clear apprehension of the intrinsic worthlessness of this and most other objects of men's ordinary desires and aims. Pleasure, indeed, Antisthenes declared roundly to be an evil; "Better madness than a surrender to pleasure." He did not overlook the need of supplementing merely intellectual insight by "Socratic force of soul"; but it seemed to him that, by insight and self-mastery combined, an absolute spiritual independence might be attained which left nothing wanting for perfect well-being (see also Diogenes). For as for poverty, painful toil, disrepute, and such evils as men dread most, these, he argued, were positively useful as means of progress in spiritual freedom and virtue. There is, however, in the Cynic notion of wisdom, no positive criterion beyond the mere negation of irrational desires and prejudices. We saw that Socrates, while not claiming to have found the abstract theory of good or wise conduct, practically understood by it the faithful performance of customary duties, maintaining always that his own happiness was therewith bound up. The Cynics more boldly discarded both pleasure and mere custom as alike irrational; but in so doing they left the freed reason with no definite aim but its own freedom. It is absurd, as Plato urged, to say that knowledge is the good, and then when asked "knowledge of what?" to have no positive reply but "of the good"; but the Cynics do not seem to have made any serious effort to escape from this absurdity.

The ultimate views of these two Socratic schools we shall have to notice presently when we come to the post-Aristotelian schools. We must now proceed to trace the fuller development of the Socratic theory in the hands of Plato and Aristotle.

Plato.

The ethics of Plato cannot properly be treated as a finished result, but rather as a continual movement from the position of Socrates towards the more complete, articulate system of Aristotle; except that there are ascetic and mystical suggestions in some parts of Plato's teaching which find no counterpart in Aristotle, and in fact disappear from Greek philosophy soon after Plato's death until they are revived and fantastically developed in Neopythagoreanism and Neoplatonism. The first stage at which we can distinguish Plato's ethical view from that of Socrates is presented in the *Protagoras*, where he makes a serious, though clearly tentative effort to define the object of that knowledge which he with his master regards as the essence of all virtue. Such knowledge, he here maintains, is really mensuration of pleasures and pains, whereby the wise man avoids those mistaken under-estimates of future feelings in comparison

with present which we commonly call “yielding to fear or desire.” This hedonism has perplexed Plato’s readers needlessly (as we have said in speaking of the Cyrenaics), inasmuch as hedonism is the most obvious corollary of the Socratic doctrine that the different common notions of good—the beautiful, the pleasant and the useful—were to be somehow interpreted by each other. By Plato, however, this conclusion could have been held only before he had accomplished the movement of thought by which he carried the Socratic method beyond the range of human conduct and developed it into a metaphysical system.

This movement may be expressed thus. “If we know,” said Socrates, “what justice is, we can give an account or definition of it”; true knowledge must be knowledge of the general fact, common to all the individual cases to which we apply our general notion. But this must be no less true of other objects of thought and discourse; the same relation of general notions to particular examples extends through the whole physical universe; we can think and talk of it only by means of such notions. True or scientific knowledge then must be general knowledge, relating, not to individuals primarily, but to the general facts or qualities which individuals exemplify; in fact, our notion of an individual, when examined, is found to be an aggregate of such general qualities. But, again, the object of true knowledge must be what really exists; hence the reality of the universe must lie in general facts or relations, and not in the individuals that exemplify them.

So far the steps are plain enough; but we do not yet see how this logical Realism (as it was afterwards called) comes to have the essentially ethical character that especially interests us in Platonism. Plato’s philosophy is now concerned with the whole universe of being; yet the ultimate object of his philosophic contemplation is still “the good,” now conceived as the ultimate ground of all being and knowledge. That is, the essence of the universe is identified with its end,—the “formal” with the “final” cause of things, to use the later Aristotelian phraseology. How comes this about?

Perhaps we may best explain this by recurring to the original application of the Socratic method to human affairs. Since all rational activity is for some end, the different arts or functions of human industry are naturally defined by a statement of their ends or uses; and similarly, in giving an account of the different artists and functionaries, we necessarily state their end, “what they are good for.” In a society well ordered on Socratic principles, every human being would be put to some use; the essence of his life would consist in doing what he was good for (his proper ἔργον). But again, it is easy to extend this view throughout the whole region of organized life; an eye that does not attain its end by seeing is without the essence of an eye. In short, we may say of all organs and instruments that they are what we think them in proportion as they fulfil their function and attain their end. If, then, we conceive the whole universe organically, as a complex arrangement of means to ends, we shall understand how Plato might hold that all things really *were*, or (as we say) “realized their idea,” in proportion as they accomplished the special end or good for which they were adapted. Even Socrates, in spite of his aversion to physics, was led by pious reflection to expound a teleological view of the physical world, as ordered in all its parts by divine wisdom for the realization of some divine end; and, in the metaphysical turn which Plato gave to this view, he was probably anticipated by Euclid of Megara, who held that the one real being is “that which we call by many names, Good, Wisdom, Reason or God,” to which Plato, raising to a loftier significance the Socratic identification of the beautiful with the useful, added the further name of Absolute Beauty, explaining how man’s love of the beautiful finally reveals itself as the yearning for the end and essence of being.

Plato, therefore, took this vast stride of thought, and identified the ultimate notions of ethics and ontology. We have now to see what attitude he will adopt towards the practical inquiries from which he started. What will now be his view of wisdom, virtue, pleasure and their relation to human well-being?

The answer to this question is inevitably somewhat complicated. In the first place we have to observe that philosophy has now passed definitely from the market-place into the lecture-room. The quest of Socrates was for the true art of conduct for a man living a practical life among his fellows. But if the objects of abstract thought constitute the real world, of which this world of individual things is but a shadow, it is plain that the highest, most real life must lie in the former region and not in the latter. It is in contemplating the abstract reality which concrete things obscurely exhibit, the type or ideal which they imperfectly imitate, that the true life of the mind in man must consist; and as man is most truly man in proportion as he is mind, the desire of one’s own good, which Plato, following Socrates, held to be permanent and essential in every living thing, becomes in its highest form the philosophic yearning for knowledge. This yearning, he held, springs—like more sensual impulses—from a sense of want of something formerly possessed, of which there remains a latent memory in the soul, strong in proportion to its philosophic capacity; hence it is that in learning any abstract truth by scientific demonstration we merely make explicit what we already implicitly know; we bring into clear consciousness hidden memories of a state in which the soul looked upon Reality and Good face to face, before the lapse that imprisoned her in an alien body and mingled her true nature with fleshly feelings and impulses. We thus reach the paradox that the true art of living is really an “art of dying” as far as possible to mere sense, in order more fully to exist in intimate union with absolute goodness and beauty. On the other hand, since the philosopher must still live and act in the concrete sensible world, the Socratic identification of wisdom and virtue is fully maintained by Plato. Only he who apprehends good in the abstract can imitate it in such transient and imperfect good as may be realized in human life, and it is impossible that, having this knowledge, he should not act on it, whether in private or public affairs. Thus, in the true philosopher, we shall necessarily find

the practically good man, who being “likest of men to the gods is best loved by them”; and also the perfect statesman, if only the conditions of his society allow him a sphere for exercising his statesmanship.

The characteristics of this practical goodness in Plato’s matured thought correspond to the fundamental conceptions in his view of the universe. The soul of man, in its good or normal condition, must be ordered and harmonized under the guidance of reason. The question then arises, “Wherein does this order or harmony precisely consist?” In explaining how Plato was led to answer this question, it will be well to notice that, while faithfully maintaining the Socratic doctrine that the highest virtue was inseparable from knowledge of the good, he had come to recognize an inferior kind of virtue, possessed by men who were not philosophers. It is plain that if the good that is to be known is the ultimate ground of the whole of things, it is attainable only by a select and carefully trained few. Yet we can hardly restrict all virtue to these alone. What account, then, was to be given of ordinary “civic” bravery, temperance and justice? It seemed clear that men who did their duty, resisting the seductions of fear and desire, must have right opinions, if not knowledge, as to the good and evil in human life; but whence comes this right “opinion”? Partly, Plato said, it comes by nature and “divine allotment,” but for its adequate development “custom and practice” are required. Hence the paramount importance of education and discipline for civic virtue; and even for future philosophers such moral culture, in which physical and aesthetic training must co-operate, is indispensable; no merely intellectual preparation will suffice. His point is that perfect knowledge cannot be implanted in a soul that has not gone through a course of preparation including much more than physical training. What, then, is this preparation? A distinct step in psychological analysis was taken when Plato recognized that its effect was to produce the “harmony” above mentioned among different parts of the soul, by subordinating the impulsive elements to reason. These non-rational elements he further distinguished as appetitive (τὸ ἐπιθυμητικόν) and spirited (τὸ θυμοειδές or θυμός)—the practical separateness of which from each other and from reason he held to be established by our inner experience.

Virtue a harmony.

On this triple division of the soul he founded a systematic view of the four kinds of goodness recognized by the common moral consciousness of Greece, and in later times known as the Cardinal Virtues (*q.v.*). Of these the two most fundamental were (as has been already indicated) wisdom—in its highest form philosophy—and that harmonious and regulated activity of all the elements of the soul which Plato regards as the essence of uprightness in social relations (δικαιοσύνη). The import of this term is essentially social; and we can explain Plato’s use of it only by reference to the analogy which he drew between the individual man and the community. In a rightly ordered polity social and individual well-being alike would depend on that harmonious action of diverse elements, each performing its proper function, which in its social application is more naturally termed δικαιοσύνη. We see, moreover, how in Plato’s view the fundamental virtues, Wisdom and Justice in their highest forms, are mutually involved. Wisdom will necessarily maintain orderly activity, and this latter consists in regulation by wisdom, while the two more special virtues of Courage (ἀνδρεία) and Temperance (σωφροσύνη) are only different sides or aspects of this wisely regulated action of the complex soul.

Such, then, are the forms in which essential good seemed to manifest itself in human life. It remains to ask whether the statement of these gives a complete account of human well-being, or whether pleasure also is to be included. On this point Plato’s view seems to have gone through several oscillations. After apparently maintaining (*Protagoras*) that pleasure is the good, he passes first to the opposite extreme, and denies it (*Phaedo, Gorgias*) to be a good at all. For (1), as concrete and transient, it is obviously not the real essential good that the philosopher seeks; (2) the feelings most prominently recognized as pleasures are bound up with pain, as good can never be with evil; in so far, then, as common sense rightly recognizes some pleasures as good, it can only be from their tendency to produce some further good. This view, however, was too violent a divergence from Socratism for Plato to remain in it. That pleasure is not the real absolute good, was no ground for not including it in the good of concrete human life; and after all only coarse and vulgar pleasures were indissolubly linked to the pains of want. Accordingly, in the *Republic* he has no objection to trying the question of the intrinsic superiority of philosophic or virtuous[2] life by the standard of pleasure, and argues that the philosophic (or good) man alone enjoys real pleasure, while the sensualist spends his life in oscillating between painful want and the merely neutral state of painlessness, which he mistakes for positive pleasure. Still more emphatically is it declared in the *Laws* that when we are “discoursing to men, not to gods,” we must show that the life which we praise as best and noblest is also that in which there is the greatest excess of pleasure over pain. But though Plato holds this inseparable connexion of best and pleasantest to be true and important, it is only for the sake of the vulgar that he lays this stress on pleasure. For in the most philosophical comparison in the *Philebus* between the claims of pleasure and wisdom the former is altogether worsted; and though a place is allowed to the pure pleasures of colour, form and sound, and of intellectual exercise, and even to the “necessary” satisfaction of appetite, it is only a subordinate one. At the same time, in his later view, Plato avoids the exaggeration of denying all positive quality of pleasure even to the coarser sensual gratifications; they are undoubtedly cases of that “replenishment” or “restoration” to its “natural state” of a bodily organ, in which he defines pleasure to consist (see *Timaeus*, pp. 64, 65); he merely maintains that the common estimate of them is to a large extent illusory, or a false appearance of pleasure is produced by contrast with the antecedent or concomitant painful condition of the organ. It is not surprising that this somewhat complicated and delicately balanced view of the relations of

"good" and "pleasure" was not long maintained within the Platonic school, and that under Speusippus, Plato's successor, the main body of Platonists took up a simply anti-hedonistic position, as we learn from the polemic of Aristotle. In the *Philebus*, however, though a more careful psychological analysis leads him to soften down the exaggerations of this attack on sensual pleasure, the antithesis of knowledge and pleasure is again sharpened, and a desire to depreciate even good pleasures is more strongly shown; still even here pleasure is recognized as a constituent of that philosophic life which is the highest human good, while in the *Laws*, where the subject is more popularly treated, it is admitted that we cannot convince man that the just life is the best unless we can also prove it to be the pleasantest.

Plato and Aristotle.

When a student passes from Plato to Aristotle, he is so forcibly impressed by the contrast between the habits of mind of the two authors, and the literary manners of the two philosophers, that it is easy to understand how their systems have come to be popularly conceived as diametrically opposed to each other; and the uncompromising polemic which Aristotle, both in his ethical and in his metaphysical treatises, directs against Plato and the platonists, has tended strongly to confirm this view. Yet a closer inspection shows us that when a later president of the Academy (Antiochus of Ascalon) repudiated the scepticism which for two hundred years had been accepted as the traditional Platonic doctrine, he had good grounds for claiming Plato and Aristotle as consentient authorities for the ethical position which he took up. For though Aristotle's divergence from Plato is very conspicuous when we consider either his general conception of the subject of ethics, or the details of his system of virtues, still his agreement with his master is almost complete as regards the main outline of his theory of human good; the difference between the two practically vanishes when we view them in relation to the later controversy between Stoics and Epicureans. Even on the cardinal point on which Aristotle entered into direct controversy with Plato, the definite disagreement between the two is less than at first appears; the objections of the disciple hit that part of the master's system that was rather imagined than thought; the main positive result of Platonic speculation only gains in distinctness by the application of Aristotelian analysis.

Plato, we saw, held that there is one supreme science or wisdom, of which the ultimate object is absolute good; in the knowledge of this, the knowledge of all particular goods—that is, of all that we rationally desire to know—is implicitly contained; and also all practical virtue, as no one who truly knows what is good can fail to realize it. But in spite of the intense conviction with which he thus identified metaphysical speculation and practical wisdom, we find in his writings no serious attempt to deduce the particulars of human well-being from his knowledge of absolute good, still less to unfold from it the particular cognitions of the special arts and sciences. Indeed, we may say that the distinction which Aristotle explicitly draws between speculative science or wisdom and practical wisdom (on its political side statesmanship) is really indicated in Plato's actual treatment of the subjects, although the express recognition of it is contrary to his principles. The discussion of good (*e.g.*) in his *Philebus* relates entirely to human good, and the respective claims of Thought and Pleasure to constitute this; he only refers in passing to the Divine Thought that is the good of the ordered world, as something clearly beyond the limits of the present discussion. So again, in his last great ethico-political treatise (the *Laws*) there is hardly a trace of his peculiar metaphysics. On the other hand, the relation between human and divine good, as presented by Aristotle, is so close that we can hardly conceive Plato as having definitely thought it closer. The substantial good of the universe, in Aristotle's view, is the pure activity of universal abstract thought, at once subject and object, which, itself changeless and eternal, is the final cause and first source of the whole process of change in the concrete world. And both he and Plato hold that a similar activity of pure speculative intellect is that in which the philosopher will seek to exist, though he must, being a man, concern himself with the affairs of ordinary human life, a region in which his highest good will be attained by realizing perfect moral excellence. No doubt Aristotle's demonstration of the inappropriateness of attributing moral excellence to the Deity seems to contradict Plato's doctrine that the just man as such is "likest the gods," but here again the discrepancy is reduced when we remember that the essence of Plato's justice (δικαιοσύνη) is harmonious activity. No doubt, too, Aristotle's attribution of pleasure to the Divine Existence shows a profound metaphysical divergence from Plato; but it is a divergence which has no practical importance. Nor, again, is Aristotle's divergence from the Socratic principle that all "virtue is knowledge" substantially greater than Plato's, though it is more plainly expressed. Both accept the paradox in the qualified sense that no one can deliberately act contrary to what appears to him good, and that perfect virtue is inseparably bound up with perfect wisdom or moral insight. Both, however, recognize that this actuality of moral insight is not a function of the intellect only, but depends rather on careful training in good habits applied to minds of good natural dispositions, though the doctrine has no doubt a more definite and prominent place in Aristotle's system. The disciple certainly takes a step in advance by stating definitely, as an essential characteristic of virtuous action, that it is chosen for its own sake, for the beauty of virtue alone; but herein he merely formulates the conviction that his master inspires. Nor, finally, does Aristotle's account of the relation of pleasure to human well-being (although he has to combat the extreme anti-hedonism to which the Platonic school under Speusippus had been led) differ materially from the outcome of Plato's thought on this point, as the later dialogues present it to us. Pleasure, in Aristotle's view, is not the primary constituent of well-being, but rather an inseparable accident of it; human well-being is essentially well-doing, excellent activity of some kind, whether its aim and end be abstract truth or noble conduct; knowledge and virtue are objects of rational choice apart from the pleasure attending them; still all activities are attended and in a manner perfected by pleasure, which

is better and more desirable in proportion to the excellence of the activity. He no doubt criticizes Plato's account of the nature of pleasure, arguing that we cannot properly conceive pleasure either as a "process" or as "replenishment"—the last term, he truly says, denotes a material rather than a psychical fact. But this does not interfere with the general ethical agreement between the two thinkers; and the doctrine that vicious pleasures are not true or real pleasures is so characteristically Platonic that we are almost surprised to find it in Aristotle.

Aristotle's ethics.

In so far as there is any important difference between the Platonic and the Aristotelian views of human good, we may observe that the latter has substantially a closer correspondence to the positive element in the ethical teaching of Socrates, though it is presented in a far more technical and scholastic form, and involves a more distinct rejection of the fundamental Socratic paradox. The same result appears when we compare the methods of the three philosophers. Although the Socratic induction forms a striking feature of Plato's dialogues, his ideal method of ethics is purely deductive; he admits common sense only as supplying provisional steps and starting-points from which the mind is to ascend to knowledge of absolute good, through which knowledge alone, as he conceives, the lower notions of particular goods are to be truly conceived. Aristotle, discarding the transcendentalism of Plato, naturally retained from Plato's teaching the original Socratic method of induction from and verification by common opinion. Indeed, the windings of his exposition are best understood if we consider his literary manner as a kind of Socratic dialogue formalized and reduced to a monologue. He first leads us by an induction to the fundamental notion of ultimate end or good for man. All men, in acting, aim at some result, either for its own sake or as a means to some further end; but obviously not everything can be sought merely as a means; there must be some ultimate end. In fact men commonly recognize such an end, and agree to call it well-being[3] (εὐδαιμονία). But they take very different views of its nature; how shall we find the true view? We observe that men are classified according to their functions; all kinds of man, and indeed all organs of man, have their special functions, and are judged as functionaries and organs according as they perform their functions well or ill. May we not then infer that man, as man, has his proper function, and that the well-being or "doing well" that all seek really lies in fulfilling well the proper function of man,—that is, in living well that life of the rational soul which we recognize as man's distinctive attribute?

Again, this Socratic deference to common opinion is not shown merely in the way by which Aristotle reaches his fundamental conception; it equally appears in his treatment of the conception itself. In the first place, though in Aristotle's view the most perfect well-being consists in the exercise of man's "divinest part," pure speculative reason, he keeps far from the paradox of putting forward this and nothing else as human good; so far, indeed, that the greater part of his treatise is occupied with an exposition of the inferior good which is realized in practical life when the appetitive or impulsive (semi-rational) element of the soul operates under the due regulation of reason. Even when the notion of "good performance of function" was thus widened, and when it had further taken in the pleasure that is inseparably connected with such functioning, it did not yet correspond to the whole of what a Greek commonly understood as "human well-being." We may grant, indeed, that a moderate provision of material wealth is indirectly included, as an indispensable pre-requisite of a due performance of many functions as Aristotle conceives it—his system admits of no beatitudes for the poor; still there remain other goods, such as beauty, good birth, welfare of progeny, the presence or absence of which influenced the common view of a man's well-being, though they could hardly be shown to be even indirectly important to his "well-acting." These Aristotle attempts neither to exclude from the philosophic conception of well-being nor to include in his formal definition of it. The deliberate looseness which is thus given to his fundamental doctrine characterizes more or less his whole discussion of ethics. He plainly says that the subject does not admit of completely scientific treatment; his aim is to give not a definite theory of human good, but a practically adequate account of its most important constituents.

The most important element, then, of well-being or good life for ordinary men Aristotle holds to consist in well-doing as determined by the notions of the different moral excellences. In expounding these, he gives throughout the pure result of analytical observation of the common moral consciousness of his age. Ethical truth, in his view, is to be attained by careful comparison of particular moral opinions, just as physical truth is to be obtained by induction from particular physical observations. On account of the conflict of opinion in ethics we cannot hope to obtain certainty upon all questions; still reflection will lead us to discard some of the conflicting views and find a reconciliation for others, and will furnish, on the whole, a practically sufficient residuum of moral truth. This adhesion to common sense, though it involves a sacrifice of both depth and completeness in Aristotle's system, gives at the same time an historical interest which renders it deserving of special attention as an analysis of the current Greek ideal of "fair and good life" (καλοκἀγαθία). His virtues are not arranged on any clear philosophic plan; the list shows no serious attempt to consider human life exhaustively, and exhibit the standard of excellence appropriate to its different departments or aspects. He seems to have taken as a starting-point Plato's four cardinal virtues. The two comprehensive notions of Wisdom and Justice (δικαιοσύνη) he treats separately. As regards both his analysis leads him to diverge considerably from Plato. As we saw, his distinction between practical and speculative Wisdom belongs to the deepest of his disagreements with his master; and in the case of δικαιοσύνη again he distinguishes the wider use of the term to express Law-observance, which (he says) coincides with the social side of virtue generally, and its narrower use for the virtue that "aims at a kind of equality," whether (1) in the distribution of wealth, honour,

&c., or (2) in commercial exchange, or (3) in the reparation of wrong done. Then, in arranging the other special virtues, he begins with courage and temperance, which (after Plato) he considers as the excellences of the "irrational element" of the soul. Next follow two pairs of excellences, concerned respectively with wealth and honour: (1) liberality and magnificence, of which the latter is exhibited in greater matters of expenditure, and (2) laudable ambition and highmindedness similarly related to honour. Then comes gentleness—the virtue regulative of anger; and the list is concluded by the excellences of social intercourse, friendliness (as a mean between obsequiousness and surliness), truthfulness and decorous wit.

The abundant store of just and close analytical observation contained in Aristotle's account of these notions give it a permanent interest, even beyond its historical value as a delineation of the Greek ideal of "fair and good" life.[4] But its looseness of arrangement and almost grotesque co-ordination of qualities widely differing in importance are obvious. Thus his famous general formula for virtue, that it is a mean or middle state, always to be found somewhere between the vices which stand to it in the relation of excess and defect, scarcely avails to render his treatment more systematic. It was important, no doubt, to express the need of observing due measure and proportion, in order to attain good results in human life no less than in artistic products; but the observation of this need was no new thing in Greek literature; indeed, it had already led the Pythagoreans and Plato to find the ultimate essence of the ordered universe in number. But Aristotle's purely quantitative statement of the relation of virtue and vice is misleading, even where it is not obviously inappropriate; and sometimes leads him to such eccentricities as that of making simple veracity a mean between boastfulness and mock-modesty.[5]

It ought to be said that Aristotle does not present the formula just discussed as supplying a criterion of good conduct in any particular case; he expressly leaves this to be determined by "correct reasoning, and the judgment of the practically-wise man (ὁ φρόνιμος)." We cannot, however, find that he has furnished any substantial principles for its determination; indeed, he hardly seems to have formed a distinct general idea of the practical syllogism by which he conceives it to be effected.[6] The kind of reasoning which his view of virtuous conduct requires is one in which the ultimate major premise states a distinctive characteristic of some virtue, and one or more minor premises show that such characteristic belongs to a certain mode of conduct under given circumstances; since it is essential to good conduct that it should contain its end in itself, and be chosen for its own sake. But he has not failed to observe that practical reasonings are not commonly of this kind, but are rather concerned with actions as means to ulterior ends; indeed, he lays stress on this as a characteristic of the "political" life, when he wishes to prove its inferiority to the life of pure speculation. Though common sense will admit that virtues are the best of goods, it still undoubtedly conceives practical wisdom as chiefly exercised in providing those inferior goods which Aristotle, after recognizing the need or use of them for the realization of human well-being, has dropped out of sight; and the result is that, in trying to make clear his conception of practical wisdom, we find ourselves fluctuating continually between the common notion, which he does not distinctly reject, and the notion required as the keystone of his ethical system.

Transition to Stoicism.

On the whole, there is probably no treatise so masterly as Aristotle's *Ethics*, and containing so much close and valid thought, that yet leaves on the reader's mind so strong an impression of dispersive and incomplete work. It is only by dwelling on these defects that we can understand the small amount of influence that his system exercised during the five centuries after his death, as compared with the effect which it has had, directly or indirectly, in shaping the thought of modern Europe. Partly, no doubt, the limited influence of his disciples, the Peripatetics (*q.v.*), is to be attributed to that exaltation of the purely speculative life which distinguished the Aristotelian ethics from other later systems, and which was too alien from the common moral consciousness to find much acceptance in an age in which the ethical aims of philosophy had again become paramount. Partly, again, the analytical distinctness of Aristotle's manner brings into special prominence the difficulties that attend the Socratic effort to reconcile the ideal aspirations of men with the principles on which their practical reasonings are commonly conducted. The conflict between these two elements of Common Sense was too profound to be compromised; and the moral consciousness of mankind demanded a more trenchant partisanship than Aristotle's. Its demands were met by the Stoic school which separated the moral from the worldly view of life, with an absoluteness and definiteness that caught the imagination; which regarded practical goodness as the highest manifestation of its ideal of wisdom; and which bound the common notions of duty into an apparently coherent system, by a formula that comprehended the whole of human life, and exhibited its relation to the ordered process of the universe. The intellectual descent of its ethical doctrines is principally to be traced to Socrates through the Cynics, though an important element in them seems attributable to the school that inherited the "Academy" of Plato. Both Stoic and Cynic maintained, in its sharpest form, the fundamental tenet that the practical knowledge which is virtue, with the condition of soul that is inseparable from it, is alone to be accounted good. He who exercises this wisdom or knowledge has complete well-being; all else is indifferent to him. It is true that the Cynics were more concerned to emphasize the negative side of the sage's well-being, while the Stoics brought into more prominence its positive side. This difference, however, did not amount to disagreement. The Stoics, in fact, seem generally to have regarded the eccentricities of Cynicism as an emphatic manner of expressing the essential antithesis between philosophy and the world; a manner which, though not necessary or even normal, might yet be advantageously adopted by the sage under certain circumstances.[7]

Wherein, then, consists this knowledge or wisdom that makes free and perfect? Both Cynics and Stoics (*q.v.*) agreed that the most important part of it was the knowledge that the sole good of man lay in this knowledge or wisdom itself. It must be understood that by wisdom they meant wisdom realized in act; indeed, they did not conceive the existence of wisdom as separable from such realization. We may observe, too, that the Stoics rejected the divergence which we have seen gradually taking place in Platonic-Aristotelian thought from the position of Socrates, "that no one aims at what he knows to be bad." The stress that their psychology laid on the essential unity of the rational self that is the source of voluntary action prevented them from accepting Plato's analysis of the soul into a regulative element and elements needing regulation. They held that what we call passion is a morbid condition of the rational soul, involving erroneous judgment as to what is to be sought or shunned. From such passionate errors the truly wise man will of course be free. He will be conscious indeed of physical appetite; but he will not be misled into supposing that its object is really a good; he cannot, therefore, hope for the attainment of this object or fear to miss it, as these states involve the conception of it as a good. Similarly, though like other men he will be subject to bodily pain, this will not cause him mental grief or disquiet, as his worst agonies will not disturb his clear conviction that it is really indifferent to his true reasonable self.

Stoicism.

That this impassive sage was a being not to be found among living men the later Stoics at least were fully aware. They faintly suggested that one or two moral heroes of old time might have realized the ideal, but they admitted that all other philosophers (even) were merely in a state of progress towards it. This admission did not in the least diminish the rigour of their demand for absolute loyalty to the exclusive claims of wisdom. The assurance of its own unique value that such wisdom involved they held to be an abiding possession for those who had attained it;[8] and without this assurance no act could be truly wise or virtuous. Whatever was not of knowledge was of sin; and the distinction between right and wrong being absolute and not admitting of degrees all sins were equally sinful; whoever broke the least commandment was guilty of the whole law. Similarly, all wisdom was somehow involved in any one of the manifestations of wisdom, commonly distinguished as particular virtues; though whether these virtues were specifically distinct, or only the same knowledge in different relations, was a subtle question on which the Stoics do not seem to have been agreed.

Aristotle had already been led to attempt a refutation of the Socratic identification of virtue with knowledge; but his attempt had only shown the profound difficulty of attacking the paradox, so long as it was admitted that no one could of deliberate purpose act contrary to what seemed to him best. Now, Aristotle's divergence from Socrates had not led him so far as to deny this; while for the Stoics who had receded to the original Socratic position, the difficulty was still more patent. This theory of virtue led them into two dilemmas. Firstly, if virtue is knowledge, does it follow that vice is involuntary? If not, it must be that ignorance is voluntary. This alternative is the less dangerous to morality, and as such the Stoics chose it. But they were not yet at the end of their perplexities; for while they were thus driven to an extreme extension of the range of human volition, their view of the physical universe involved an equally thorough-going determinism. How could the vicious man be responsible if his vice were strictly pre-determined? The Stoics answered that the error which was the essence of vice was so far voluntary that it could be avoided if men chose to exercise their reason. No doubt it depended on the innate force and firmness[9] of a man's soul whether his reason was effectually exercised; but moral responsibility was saved if the vicious act proceeded from the man himself and not from any external cause.

With all this we have not ascertained the positive practical content of this wisdom. How are we to emerge from the barren circle of affirming (1) that wisdom is the sole good and unwisdom the sole evil, and (2) that wisdom is the knowledge of good and evil; and attain some method for determining the particulars of good conduct? The Cynics made no attempt to solve this difficulty; they were content to mean by virtue what any plain man meant by it, except in so far as their sense of independence led them to reject certain received precepts and prejudices. The Stoics, on the other hand, not only worked out a detailed system of duties—or, as they termed them, "things meet and fit" (καθήκοντα) for all occasions of life; they were further especially concerned to comprehend them under a general formula. They found this by bringing out the positive significance of the notion of Nature, which the Cynic had used chiefly in a negative way, as an antithesis to the "consentions" (νόμος), from which his knowledge had made him free. Even in this negative use of the notion it is necessarily implied that whatever active tendencies in man are found to be "natural"—that is, independent of and uncorrupted by social customs and conventions—will properly take effect in outward acts, but the adoption of "conformity to nature" as a general positive rule for outward conduct seems to have been due to the influence on Zeno of Academic teaching. Whence, however, can this authority belong to the natural, unless nature be itself an expression or embodiment of divine law and wisdom? The conception of the world, as organized and filled by divine thought, was common, in some form, to all the philosophies that looked back to Socrates as their founder,—some even maintaining that this thought was the sole reality. This pantheistic doctrine harmonized thoroughly with the Stoic view of human good; but being unable to conceive substance idealistically, they (with considerable aid from the system of Heraclitus) supplied a materialistic side to their pantheism,—conceiving divine thought as an attribute of the purest and most primary of material substances, a subtle fiery aether. This theological view of the physical universe had a double effect on the ethics of the Stoic. In the first place it gave to his cardinal conviction of the all-sufficiency of wisdom for human well-being a root of cosmical fact, and an atmosphere of religious and social emotion. The exercise of wisdom was now viewed as the pure life of that particle of divine substance

which was in very truth the “god within him”; the reason whose supremacy he maintained was the reason of Zeus, and of all gods and reasonable men, no less than his own; its realization in any one individual was thus the common good of all rational beings as such; “the sage could not stretch out a finger rightly without thereby benefiting all other sages,”—nay, it might even be said that he was “as useful to Zeus as Zeus to him.”[10] But again, the same conception served to harmonize the higher and the lower elements of human life. For even in the physical or non-rational man, as originally constituted, we may see clear indications of the divine design, which it belongs to his rational will to carry into conscious execution; indeed, in the first stage of human life, before reason is fully developed, uncorrupted natural impulse effects what is afterwards the work of reason. Thus the formula of “living according to nature,” in its application to man as the “rational animal,” may be understood both as directing that reason is to govern, and as indicating how that government is to be practically exercised. In man, as in every other animal, from the moment of birth natural impulse prompts to the maintenance of his physical frame; then, when reason has been developed and has recognized itself as its own sole good, these “primary ends of nature” and whatever promotes these still constitute the outward objects at which reason is to aim; there is a certain value (ἀξία) in them, in proportion to which they are “preferred” (προηγμένα) and their opposites “rejected” (ἀποπροηγμένα); indeed it is only in the due and consistent exercise of such choice that wisdom can find its practical manifestation. In this way all or most of the things commonly judged to be “goods”—health, strength, wealth, fame,[11] &c.,—are brought within the sphere of the sage’s choice, though his real good is solely in the wisdom of the choice, and not in the thing chosen.

The doctrine of conformity to Nature as the rule of conduct was not peculiar to Stoicism. It is found in the theories of Speusippus, Xenocrates, and also to some extent in those of the Peripatetics. The peculiarity of the Stoics lay in their refusing to use the terms “good and evil” in connexion with “things indifferent,” and in pointing out that philosophers, though independent of these things, must yet deal with them in practical life.

So far we have considered the “nature” of the individual man as apart from his social relations; but the sphere of virtue, as commonly conceived, lies chiefly in these, and this was fully recognized in the Stoic account of duties (καθήκοντα); indeed, in their exposition of the “natural” basis of justice, the evidence that man was born not for himself but for mankind is the most important part of their work in the region of practical morality. Here, however, we especially notice the double significance of “natural,” as applied to (1) what actually exists everywhere or for the most part, and (2) what would exist if the original plan of man’s life were fully carried out; and we find that the Stoics have not clearly harmonized the two elements of the notion. That man was “naturally” a social animal Aristotle had already taught; that all rational beings, in the unity of the reason that is common to all, form naturally one community with a common law was (as we saw) an immediate inference from the Stoic conception of the universe as a whole. That the members of this “city of Zeus” should observe their contracts, abstain from mutual harm, combine to protect each other from injury, were obvious points of natural law; while again, it was clearly necessary to the preservation of human society that its members should form sexual unions, produce children, and bestow care on their rearing and training. But beyond this nature did not seem to go in determining the relations of the sexes; accordingly, we find that community of wives was a feature of Zeno’s ideal commonwealth, just as it was of Plato’s; while, again, the strict theory of the school recognized no government or laws as true or binding except those of the sage; he alone is the true ruler, the true king. So far, the Stoic “nature” seems in danger of being as revolutionary as Rousseau’s. Practically, however, this revolutionary aspect of the notion was kept for the most part in the background; the rational law of an ideal community was not distinguished from the positive ordinances and customs of actual society; and the “natural” ties that actually bound each man to family, kinsmen, fatherland, and to unwise humanity generally, supplied the outline on which the external manifestation of justice was delineated. It was a fundamental maxim that the sage was to take part in public life; and it does not appear that his political action was to be regulated by any other principles than those commonly accepted in his community. Similarly, in the view taken by the Stoics of the duties of social decorum, and in their attitude to the popular religion, we find a fluctuating compromise between the disposition to repudiate what is conventional, and the disposition to revere what is established, each tendency expressing in its own way the principle of “conforming to nature.”

Stoics and hedonists.

Among the primary ends of nature, in which wisdom recognized a certain preferability, the Stoics included freedom from bodily pain; but they refused, even in this outer court of wisdom, to find a place for pleasure. They held that the latter was not an object of uncorrupted natural impulse, but an “aftergrowth” (ἐπιγέννημα). They thus endeavoured to resist Epicureanism even on the ground where the latter seems prima facie strongest; in its appeal, namely, to the natural pleasure-seeking of all living things. Nor did they merely mean by pleasure (ἡδονή) the gratification of bodily appetite; we find (*e.g.*) Chrysippus urging, as a decisive argument against Aristotle, that pure speculation was “a kind of amusement; that is, pleasure.” Even the “joy and gladness” (χαρά, εὐφροσύνη) that accompany the exercise of virtue seem to have been regarded by them as merely an inseparable accident, not the essential constituent of well-being. It is only by a later modification of Stoicism that cheerfulness or peace of mind is taken as the real ultimate end, to which the exercise of virtue is merely a means. At the same time it is probable that the serene joys of virtue and the grieflessness which the sage was conceived to maintain amid the worst tortures, formed the main attractions of Stoicism for ordinary minds. In this sense it may be fairly said that Stoics and Epicureans made rival offers to mankind of the same

kind of happiness; and the philosophical peculiarities of either system may be traced to the desire of being undisturbed by the changes and chances of life. The Stoic claims on this head were the loftiest; as the well-being of their sage was independent, not only of external things and bodily conditions, but of time itself; it was fully realized in a single exercise of wisdom and could not be increased by duration. This paradox is violent, but it is quite in harmony with the spirit of Stoicism; and we are more startled to find that the Epicurean sage, no less than the Stoic, is to be happy even on the rack; that his happiness, too, is unimpaired by being restricted in duration, when his mind has apprehended the natural limits of life; that, in short, Epicurus makes no less strenuous efforts than Zeno to eliminate imperfection from the conditions of human existence. This characteristic, however, is the key to the chief differences between Epicureanism and the more naïve hedonism of Aristippus. The latter system gave the simplest and most obvious answer to the inquiry after ultimate good for man; but besides being liable, when developed consistently, to offend the common moral consciousness, it conspicuously failed to provide the "completeness" and "security" which, as Aristotle says, "one divines to belong to man's true Good." Philosophy, in the Greek view, should be the art as well as the science of good life; and hedonistic philosophy would seem a bungling and uncertain art of pleasure, as pleasure is ordinarily conceived. Nay, it would even be found that the habit of philosophical reflection often operated adversely to the attainment of this end, by developing the thinker's self-consciousness, so as to disturb that normal relation to external objects on which the zest of ordinary enjoyment depends. Hence we find that later thinkers of the Cyrenaic school felt themselves compelled to change their fundamental notion; thus Theodorus defined the good as "gladness" (χαρά) depending on wisdom, as distinct from mere pleasure, while Hegesias proclaimed that happiness was unattainable, and that the chief function of wisdom was to render life painless by producing indifference to all things that give pleasure. But by such changes their system lost the support that it had had in the pleasure-seeking tendencies of ordinary men. It was clear that if philosophic hedonism was to be established on a broad and firm basis, it must in its notion of good combine what the plain man naturally sought with what philosophy could plausibly offer. Such a combination was effected, with some little violence, by Epicurus; whose system with all its defects showed a remarkable power of standing the test of time, as it attracted the unqualified adhesion of generation after generation of disciples for a period of some six centuries.

Epicurus.

In the fundamental principle of his philosophy Epicurus is not original. Aristippus (cf. also Plato in the *Protagoras* and Eudoxus) had already maintained that pleasure is the sole ultimate good, and pain the sole evil; that no pleasure is to be rejected except for its painful consequences, and no pain to be chosen except as a means to greater pleasure; that the stringency of all laws and customs depends solely on the legal and social penalties attached to their violation; that, in short, all virtuous conduct and all speculative activity are empty and useless, except as contributing to the pleasantness of the agent's life. And Epicurus assures us that he means by pleasure what plain men mean by it; and that if the gratifications of appetite and sense are discarded, the notion is emptied of its significance. So far the system would seem to suit the inclinations of the most thorough-going voluptuary. The originality of Epicurus lay in his theory that the highest point of pleasure, whether in body or mind, is to be attained by the mere removal of pain or disturbance, after which pleasure admits of variation only and not of augmentation; that therefore the utmost gratification of which the body is capable may be provided by the simplest means, and that "natural wealth" is no more than any man can earn. When further he teaches that the attainment of happiness depends almost entirely upon insight and right calculation, fortune having very little to do with it; that the pleasures and pains of the mind are far more important than those of the body, owing to the accumulation of feeling caused by memory and anticipation; and that an indispensable condition of mental happiness lies in relieving the mind of all superstitions, which can be effected only by a thorough knowledge of the physical universe—he introduces an ample area for the exercise of the philosophic intellect. So again, in the stress that he lays on the misery which the most secret wrong-doing must necessarily cause from the perpetual fear of discovery, and in his exuberant exaltation of the value of disinterested friendship, he shows a sincere, though not completely successful, effort to avoid the offence that consistent egoistic hedonism is apt to give to ordinary human feeling. As regards friendship, Epicurus was a man of peculiarly unexclusive sympathies.[12] The genial fellowship of the philosophic community that he collected in his garden remained a striking feature in the traditions of his school; and certainly the ideal which Stoics and Epicureans equally cherished of a brotherhood of sages was most easily realized on the Epicurean plan of withdrawing from political and dialectical conflict to simple living and serene leisure, in imitation of the gods apart from the fortuitous concourse of atoms that we call a world. No doubt it was rather the practical than the theoretical side of Epicureanism which gave it so strong a hold on succeeding generations.

Later Greek philosophy. Stoicism in Rome.

The two systems that have just been described were those that most prominently attracted the attention of the ancient world, so far as it was directed to ethics, from their almost simultaneous origin to the end of the 2nd century A.D., when Stoicism almost vanishes from our view. But side by side with them the schools of Plato and Aristotle still maintained a continuity of tradition, and a more or less vigorous life; and philosophy, as a recognized element of Graeco-Roman culture, was understood to be divided among these four branches. The internal history, however, of the four schools was very different. We find no development worthy of notice in Aristotelian ethics (see PERIPATETICS). The Epicureans, again, from their unquestioning acceptance of the "dogmas"[13] of their

founder, almost deserve to be called a sect rather than a school. On the other hand, the changes in Stoicism are very noteworthy; and it is the more easy to trace them, as the only original writings of this school which we possess are those of the later Roman Stoics. These changes may be attributed partly to the natural inner development of the system, partly to the reaction of the Roman mind on the essentially Greek doctrine which it received,—a reaction all the more inevitable from the very affinity between the Stoic sage and the ancient Roman ideal of manliness. It was natural that the earlier Stoics should be chiefly occupied with delineating the inner and outer characteristics of ideal wisdom and virtue, and that the gap between the ideal sage and the actual philosopher, though never ignored, should yet be somewhat overlooked. But when the question "What is man's good?" had been answered by an exposition of perfect wisdom, the practical question "How may a man emerge from the folly of the world, and get on the way towards wisdom?" naturally attracted attention; and the preponderance of moral over scientific interest, which was characteristic of the Roman mind, gave this question especial prominence. The sense of the gap between theory and fact gives to the religious element of Stoicism a new force; the soul, conscious of its weakness, leans on the thought of God, and in the philosopher's attitude towards external events, pious resignation preponderates over self-poised indifference; the old self-reliance of the reason, looking down on man's natural life as a mere field for its exercise, makes room for a positive aversion to the flesh as an alien element imprisoning the spirit; the body has come to be a "corpse which the soul sustains,"[14] and life a "sojourn in a strange land";[15] in short, the ethical idealism of Zeno has begun to borrow from the metaphysical idealism of Plato.

History of Plato's school.

In no one of these schools was the outward coherence of tradition so much strained by inner changes as it was in Plato's. The alterations, however, in the metaphysical position of the Academics had little effect on their ethical teaching, as, even during the period of Scepticism, they appear to have presented as probable the same general view of human good which Antiochus afterwards dogmatically announced as a revival of the common doctrine of Plato and Aristotle. And during the period of a century and a half between Antiochus and Plutarch, we may suppose the school to have maintained the old controversy with Stoicism on much the same ground, accepting the formula of "life according to nature," but demanding that the "good" of man should refer to his nature as a whole, the good of his rational part being the chief element, and always preferable in case of conflict, but yet not absolutely his sole good. In Plutarch, however, we see the same tendencies of change that we have noticed in later Stoicism. The conception of a normal harmony between the higher and lower elements of human life has begun to be disturbed, and the side of Plato's teaching that deals with the inevitable imperfections of the world of concrete experience becomes again prominent. For example, we find Plutarch amplifying the suggestion in Plato's latest treatise (the *Laws*) that this imperfection is due to a bad world-soul that strives against the good,—a suggestion which is alien to the general tenor of Plato's doctrine, and had consequently been unnoticed during the intervening centuries. We observe, again, the value that Plutarch attaches, not merely to the sustainment and consolation of rational religion, but to the supernatural communications vouchsafed by the divinity to certain human beings in dreams, through oracles, or by special warnings, like those of the genius of Socrates. For these flashes of intuition, he holds, the soul should be prepared by tranquil repose and the subjugation of sensuality through abstinence. The same ascetic effort to attain by aloofness from the body a pure receptivity for supernatural influences, is exhibited in Neo-Pythagoreanism. But the general tendency that we are noting did not find its full expression in a reasoned system until we come to the Egyptian Plotinus.

Neoplatonism.

The system of Plotinus (205-270 A.D.) is a striking development of that element of Platonism which has had most fascination for the medieval and even for the modern mind, but which had almost vanished out of sight in the controversies of the post-Aristotelian schools. At the same time the differences are the more noteworthy from the reverent adhesion which the Neoplatonists always maintain to Plato. Plato identified good with the real essence of things; with that in them which is definitely conceivable and knowable. It belongs to this view to regard the imperfection of things as devoid of real being, and so incapable of being definitely thought or known; accordingly, we find that Plato has no technical term for that in the concrete sensible world which hinders it from perfectly expressing the abstract ideal world, and which in Aristotle's system is distinguished as absolutely formless matter (ὕλη). And so, when we pass from the ontology to the ethics of Platonism, we find that, though the highest life is only to be realized by turning away from concrete human affairs and their material environment, still the sensible world is not yet an object of positive moral aversion; it is rather something which the philosopher is seriously concerned to make as harmonious, good and beautiful as possible. But in Neoplatonism the inferiority of the condition in which the embodied human soul finds itself is more intensely and painfully felt; hence an express recognition of formless matter (ὕλη) as the "first evil," from which is derived the "second evil," body (σῶμα), to whose influence all the evil in the soul's existence is due. Accordingly the ethics of Plotinus represent, we may say, the moral idealism of the Stoics cut loose from nature. The only good of man is the pure existence of the soul, which in itself, apart from the contagion of the body, is perfectly free from error or defect; if only it can be restored to the untrammelled activity of its original being, nothing external, nothing bodily, can positively impair its perfect welfare. It is only the lowest form of virtue—the "civic" virtue of Plato's *Republic*—that is employed in regulating those animal impulses whose presence in the soul is due to its mixture with the body; higher or philosophic wisdom, temperance, courage and justice are essentially purifications from this contagion; until

finally the highest mode of goodness is reached, in which the soul has no community with the body, and is entirely turned towards reason. It should be observed that Plotinus himself is still too Platonic to hold that the absolute mortification of natural bodily appetites is required for purifying the soul; but this ascetic inference was drawn to the fullest extent by his disciple Porphyry.

There is, however, a yet higher point to be reached in the upward ascent of the Neoplatonist from matter; and here the divergence of Plotinus from Platonic idealism is none the less striking, because it is a *bona fide* result of reverent reflection on Plato's teaching. The cardinal assumption of Plato's metaphysic is, that the real is definitely thinkable and knowable in proportion as it is real; so that the further the mind advances in abstraction from sensible particulars and apprehension of real being, the more definite and clear its thought becomes. Plotinus, however, urges that, as all thought involves difference or duality of some kind, it cannot be the primary fact in the universe, what we call God. He must be an essential unity prior to this duality, a Being wholly without difference or determination; and, accordingly, the highest mode of human existence, in which the soul apprehends this absolute, must be one in which all definite thought is transcended, and all consciousness of self lost in the absorbing ecstasy. Porphyry tells us that his master Plotinus attained the highest state four times during the six years which he spent with him.

Neoplatonism, originally Alexandrine, is often regarded as Hellenistic rather than Hellenic, a product of the mingling of Greek with Oriental civilization. But however Oriental may have been the cast of mind that welcomed this theosophic asceticism, the forms of thought by which these views were philosophically reached are essentially Greek; and it is by a thoroughly intelligible process of natural development, in which the intensification of the moral consciousness represented by Stoicism plays an important part, that the Hellenic pursuit of knowledge culminates in a preparation for ecstasy, and the Hellenic idealization of man's natural life ends in a settled antipathy to the body and its works. At the same time we ought not to overlook the affinities between the doctrine of Plotinus and that remarkable combination of Greek and Hebrew thought which Philo Judaeus had expounded two centuries before; nor the fact that Neoplatonism was developed in conscious antagonism to the new religion which had spread from Judea, and was already threatening the conquest of the Graeco-Roman world, and also to the Gnostic systems (see Gnosticism); nor, finally, that it furnished the chief theoretical support in the last desperate struggle that was made under Julian to retain the old polytheistic worship.

B. *Christianity and Medieval Ethics*.—In the present article we are not concerned with the origin of the Christian religion, nor with its outward history. Nor have we to consider the special doctrines that have formed the bond of union of the Christian communities except in their ethical aspect, their bearing on the systematization of human aims and activities. This aspect, however, must necessarily be prominent in discussing Christianity, which cannot be adequately treated merely as a system of theological beliefs divinely revealed, and special observances divinely sanctioned; for it claims to regulate the whole man, in all departments of his existence. It was not till the 4th century A.D. that the first attempt was made to offer a systematic exposition of Christian morality; and nine centuries more had passed away before a genuinely philosophic intellect, trained by a full study of Aristotle, undertook to give complete scientific form to the ethical doctrine of the Catholic church. Before, however, we take a brief survey of the progress of systematic ethics from Ambrose to Thomas Aquinas, it may be well to examine the chief features of the new moral consciousness that had spread through Graeco-Roman civilization, and was awaiting philosophic synthesis. It will be convenient to consider first the new *form* or universal characteristics of Christian morality, and afterwards to note the chief points in the *matter* or particulars of duty and virtue which received development or emphasis from the new religion.

Christian and Jewish "law of God."

The first point to be noticed is the new conception of morality as the positive law of a theocratic community possessing a written code imposed by divine revelation, and sanctioned by divine promises and threatenings. It is true that we find in ancient thought, from Socrates downwards, the notion of a law of God, eternal and immutable, partly expressed and partly obscured by the shifting codes and customs of actual human societies. But the sanctions of this law were vaguely and, for the most part, feebly imagined; its principles were essentially unwritten, and thus referred not to the external will of an Almighty Being who claimed unquestioning submission, but rather to the reason that gods and men shared, by the exercise of which alone they could be adequately known and defined. Hence, even if the notion of law had been more prominent than it was in ancient ethical thought, it could never have led to a juridical, as distinct from a philosophical, treatment of morality. In Christianity, on the other hand, we early find that the method of moralists determining right conduct is to a great extent analogous to that of juris-consults interpreting a code. It is assumed that divine commands have been implicitly given for all occasions of life, and that they are to be ascertained in particular cases by interpretation of the general rules obtained from texts of scripture, and by inference from scriptural examples. This juridical method descended naturally from the Jewish theocracy, of which Christendom was a universalization. Moral insight, in the view of the most thoughtful Jews of the age immediately preceding Christianity, was conceived as knowledge of a divine code, emanating from an authority external to human reason which had only the function of interpreting and applying its rules. This law was derived partly from Moses, partly from the utterances of the later prophets, partly from oral tradition and from the commentaries and supplementary maxims of generations of students. Christianity inherited the notion of a written divine code acknowledged as such by the "true Israel"—

now potentially including the whole of mankind, or at least the chosen of all nations,—on the sincere acceptance of which the Christian's share of the divine promises to Israel depended. And though the ceremonial part of the old Hebrew code was altogether rejected, and with it all the supplementary jurisprudence resting on tradition and erudite commentary, still God's law was believed to be contained in the sacred books of the Jews, supplemented by the teaching of Christ and his apostles. By the recognition of this law the church was constituted as an ordered community, essentially distinct from the State; the distinction between the two was emphasized by the withdrawal of the early Christians from civic life, to avoid the performance of idolatrous ceremonies imposed as official expressions of loyalty, and by the persecutions which they had to endure, when the spread of an association apparently so hostile to the framework of ancient society had at length alarmed the imperial government. Nor was the distinction obliterated by the recognition of Christianity as the state religion under Constantine.

Thus the jural form in which morality was conceived only emphasized the fundamental difference between it and the laws of the state. The ultimate sanctions of the moral code were the infinite rewards and punishments awaiting the immortal soul hereafter; but the church early felt the necessity of withdrawing the privileges of membership from apostates and allowing them to be gradually regained only by a solemn ceremonial expressive of repentance, protracted through several years. This formal and regulated "penitence" was extended from apostasy to other grave—or, as they were subsequently called, "deadly"—sins; while for minor offences all Christians were called upon to express contrition by fasting and abstinence from ordinarily permitted pleasures, as well as verbally in public and private devotions. "Excommunication" and "penance" thus came to be temporal ecclesiastical sanctions of the moral law. As the graduation of these sanctions naturally became more minute, a correspondingly detailed classification of offences was rendered necessary, and thus a system of ecclesiastical jurisprudence was gradually produced, somewhat analogous to that of Judaism. At the same time this tendency to make prominent a scheme of external duties has always been counteracted in Christianity by the remembrance of its original antithesis to Jewish legalism. We find that this antithesis, as exaggerated by some of the Gnostic sects of the 2nd and 3rd centuries A.D., led, not merely to theoretical antinomianism, but even (if the charges of their orthodox opponents are not entirely to be discredited) to gross immorality of conduct. A similar tendency has shown itself at other periods of church history. And though such antinomianism has always been sternly repudiated by the moral consciousness of Christendom, it has never been forgotten that "inwardness," rightness of heart or spirit, is the pre-eminent characteristic of Christian goodness. It must not, of course, be supposed that the need of something more than mere fulfilment of external duty was ignored even by the later Judaism. Rabbinic erudition could not forget the repression of vicious desires in the tenth commandment, the stress laid in Deuteronomy on the necessity of service to God, or the inculcation by later prophets of humility and faith. "The real and only Pharisee," says the Talmud, "is he who does the will of his Father because he loves Him." But it remains true that the contrast with the "righteousness of the scribes and pharisees" has always served to mark the requirement of "inwardness" as a distinctive feature of the Christian code—an inwardness not merely negative, tending to the repression of vicious desires as well as vicious acts, but also involving a positive rectitude of the inner state of the soul.

Christian and Pagan inwardness.

In this aspect Christianity invites comparison with Stoicism, and indeed with pagan ethical philosophy generally, if we except the hedonistic schools. Rightness of purpose, preference of virtue for its own sake, suppression of vicious desires, were made essential points by the Aristotelians, who attached the most importance to outward circumstances in their view of virtue, no less than by the Stoics, to whom all outward things were indifferent. The fundamental differences between pagan and Christian ethics depend not on any difference in the value set on rightness of heart, but on different views of the essential form or conditions of this inward rightness. In neither case is it presented purely and simply as moral rectitude. By the pagan philosophers it was always conceived under the form of Knowledge or Wisdom, it being inconceivable to all the schools sprung from Socrates that a man could truly know his own good and yet deliberately choose anything else. This knowledge, as Aristotle held, might be permanently precluded by vicious habits, or temporarily obliterated by passion, but if present in the mind it must produce rightness of purpose. Or even if it were held with some of the Stoics that true wisdom was out of the reach of the best men actually living, it none the less remained the ideal condition of perfect human life. By Christian teachers, on the other hand, the inner springs of good conduct were generally conceived as Faith and Love. Of these notions the former has a somewhat complex ethical import; it seems to blend several elements differently prominent in different minds. Its simplest and commonest meaning is that emphasized in the contrast of "faith" with "sight"; where it signifies belief in the invisible divine order represented by the church, in the actuality of the law, the threats, the promises of God, in spite of all the influences in man's natural life that tend to obscure this belief. Out of this contrast there ultimately grew an essentially different opposition between faith and knowledge or reason, according to which the theological basis of ethics was contrasted with the philosophical; the theologians maintaining sometimes that the divine law is essentially arbitrary, the expression of will, not reason; more frequently that its reasonableness is inscrutable, and that actual human reason should confine itself to examining the credentials of God's messengers, and not the message itself. But in early Christianity this latter antithesis was as yet undeveloped; faith means simply force in clinging to moral and religious conviction, whatever their rational grounds may be; this force, in the Christian consciousness, being inseparably bound up with personal loyalty and trust towards Christ, the leader

Faith.

in the battle with evil, the ruler of the kingdom to be realized. So far, however, there is no ethical difference between Christian faith and that of Judaism, or its later imitation, Mahommedanism; except that the personal affection of loyal trust is peculiarly stirred by the blending of human and divine natures in Christ, and the rule of duty impressively taught by the manifestation of his perfect life. A more distinctively Christian, and a more deeply moral, significance is given to the notion in the antithesis of "faith" and "works." Here faith means more than loyal acceptance of the divine law and reverent trust in the lawgiver; it implies a consciousness, at once continually present and continually transcended, of the radical imperfection of all human obedience to the law, and at the same time of the irremissible condemnation which this imperfection entails. The Stoic doctrine of the worthlessness of ordinary human virtue, and the stern paradox that all offenders are equally, in so far as all are absolutely, guilty, find their counterparts in Christianity; but the latter (maintaining this ideal severity in the moral standard, with an emotional consciousness of what is involved in it quite unlike that of the Stoic) overcomes its practical exclusiveness through faith. This faith, again, may be conceived in two modes, essentially distinct though usually combined. In one view it gives the believer strength to attain, by God's supernatural aid or "grace," a goodness of which he is naturally incapable; in the other view it gives him an assurance that, though he knows himself a sinner deserving of utter condemnation, a perfectly just God still regards him with favour on account of the perfect services and suffering of Christ. Of these views the former is the more catholic, more universally present in the Christian consciousness; the latter more deeply penetrates the mystery of the Atonement, as expounded in the Pauline epistles.

But faith, however understood, is rather an indispensable pre-requisite than the essential motive principle of Christian good conduct. This motive is supplied by the other central notion, love. On love depends the "fulfilling of the law," and the sole moral value of Christian duty—that is, on love to God, in the first place, which in its fullest development must spring from Christian faith; and, secondly, love to all mankind, as the objects of divine love and sharers in the humanity ennobled by the incarnation. This derivative philanthropy characterizes the spirit in which all Christian performance of social duty is to be done; loving devotion to God being the fundamental attitude of mind that is to be maintained throughout the whole of the Christian's life.

Love.

But further, as regards abstinence from unlawful acts and desires prompting to them, we have to notice another form in which the inwardness of Christian morality manifests itself, which, though less distinctive, should yet receive attention in any comparison of Christian ethics with the view of Graeco-Roman philosophy. The profound horror with which the Christian's conception of a suffering as well as an avenging divinity tended to make him regard all condemnable acts was tinged with a sentiment which we may perhaps describe as a ceremonial aversion moralized—the aversion, that is, to foulness or impurity. In Judaism, as in other, especially Oriental, religions, the natural dislike of material defilement has been elevated into a religious sentiment, and made to support a complicated system of quasi-sanitary abstinences and ceremonial purifications; then, as the ethical element predominated in the Jewish religion, a moral symbolism was felt to reside in the ceremonial code, and thus aversion to impurity came to be a common form of the ethico-religious sentiment. Then, when Christianity threw off the Mosaic ritual, this religious sense of purity was left with no other sphere besides morality; while, from its highly idealized character, it was peculiarly well adapted for that repression of vicious desires which Christianity claimed as its special function.

Purity.

The distinctive features of Christian ethics are obedience, unworldliness, benevolence, purity and humility. They are naturally connected with the more general characteristics just stated; though many of them may also be referred directly to the example and precepts of Christ, and in several cases they are clearly due to both causes, inseparably combined.

Distinctive particulars of Christian morality.

1. We may notice, in the first place, that the conception of morality as a code which, if not in itself arbitrary, is yet to be accepted by men with unquestioning submission, tends naturally to bring into prominence the virtue of *obedience to authority*; just as the philosophic view of goodness as the realization of reason gives a special value to *self-determination* and independence (as we see more clearly in the post-Aristotelian schools where ethics is distinctly separated from politics).

2. Again, the opposition between the natural world and the spiritual order into which the Christian has been born anew led not merely to a contempt equal to that of the Stoic for wealth, fame, power, and other objects of worldly pursuit, but also, for some time at least, to a comparative depreciation of the domestic and civic relations of the natural man. This tendency was exhibited most simply and generally in the earliest period of the church's history. In the view of primitive Christians, ordinary human society was a world temporarily surrendered to Satanic rule, over which a swift and sudden destruction was impending; in such a world the little band who were gathered in the ark of the church could have no part or lot,—the only attitude they could maintain was that of passive alienation. On the other hand, it was difficult practically to realize this alienation, and a keen sense of this difficulty induced the same hostility to the body as a clog and hindrance, that we find to some extent in Plato, but more fully developed in Neoplatonism, Neopythagoreanism, and other products of the mingling of Greek with Oriental thought. This feeling is exhibited in the value set on fasting in the Christian church from the earliest times, and in an extreme form in the self-torments of later monasticism; while both tendencies, anti-worldliness and anti-sensualism, seem to have combined in

causing the preference of celibacy over marriage which is common to most early Christian writers.[16] Patriotism, again, and the sense of civic duty, the most elevated of all social sentiments in the Graeco-Roman civilization, tended, under the influence of Christianity, either to expand itself into universal philanthropy, or to concentrate itself on the ecclesiastical community. "We recognize one commonwealth, the world," says Tertullian; "we know," says Origen, "that we have a fatherland founded by the word of God." We might further derive from the general spirit of Christian unworldliness that repudiation of the secular modes of conflict, even in a righteous cause, which substituted a passive patience and endurance for the old pagan virtue of courage, in which the active element was prominent. Here, however, we clearly trace the influence of Christ's express prohibition of violent resistance to violence, and his inculcation, by example and precept, of a love that was to conquer even natural resentment. An extreme result of this influence is shown in Tertullian's view, that no Christian could properly hold the office of a secular magistrate in which he would have to doom to death, chains, imprisonment; but even more sober writers, such as Ambrose, extend Christian passivity so far as to preclude self-defence even against a murderous assault. The common sense of Christendom gradually shook off these extravagances; but the reluctance to shed blood lingered long, and was hardly extinguished even by the growing horror of heresy. We have a curious relic of this in the later times of ecclesiastical persecution, when the heretic was doomed to the stake that he might be punished in some manner "short of bloodshed."[17]

3. It is, however, in the impulse given to practical beneficence in all its forms, by the exaltation of love as the root of all virtues, that the most important influence of Christianity on the particulars of civilized morality is to be found; although the exact amount of this influence is here somewhat difficult to ascertain, since it merely carries further a development traceable in the history of pagan morality. This development appears when we compare the different post-Socratic systems of ethics. In Plato's exposition of the different virtues there is no mention whatever of benevolence, although his writings show a keen sense of the importance of friendship as an element of philosophic life, especially of the intense personal affection naturally arising between master and disciple. Aristotle goes somewhat further in recognizing the moral value of friendship φιλία; and though he considers that in its highest form it can be realized only by the fellowship of the wise and good, he yet extends the notion so as to include the domestic affections, and takes notice of the importance of mutual kindness in binding together all human societies. Still in his formal statement of the different virtues, positive beneficence is discernible only under the notion of "liberality," in which form its excellence is hardly distinguished from that of graceful profusion in self-regarding expenditure (*Nic. Eth*. iv. 1). Cicero, on the other hand, in his paraphrase of a Stoic treatise on external duties (*De officiis*), ranks the rendering of positive services to other men as a chief department of social duty; and the Stoics generally recognized the universal fellowship and natural mutual claims of human beings as such. Indeed, this recognition in later Stoicism is sometimes expressed with so much warmth of feeling as to be hardly distinguishable from Christian philanthropy. Nor was this regard for humanity merely a doctrine of the school. Partly through the influence of Stoic and other Greek philosophy, partly from the natural expansion of human sympathies, the legislation of the Empire, during the first three centuries, shows a steady development in the direction of natural justice and humanity; and some similar progress may be traced in the general tone of moral opinion. Still the utmost point that this development reached fell considerably short of the standard of Christian charity. Without dwelling on the immense impetus given to the practice of social duty generally by the religion that made beneficence a form of divine service, and identified "piety" with "pity," we have to put down as definite changes introduced by Christianity—(1) the severe condemnation and final suppression of the practice of exposing infants; (2) effective abhorrence of the barbarism of gladiatorial combats; (3) immediate moral mitigation of slavery, and a strong encouragement of emancipation; (4) great extension of the eleemosynary provision made for the sick and the poor. As regards almsgiving, however—the importance of which has caused it to usurp, in modern languages, the general name of "charity"—it ought to be observed that Christianity merely universalized a duty which has always been inculcated by Judaism, within the limits of the chosen people.

Benevolence.

4. The same may be said of the stricter regulation which Christianity enforced on the relations of the sexes; except so far as the prohibition of divorce is concerned, and the stress laid on "purity of heart" as contrasted with merely outward chastity.

5. Even the peculiarly Christian virtue of humility, which presents so striking a contrast to the Greek "highmindedness," was to some extent anticipated in the Rabbinic teaching. Its far greater prominence under the new dispensation may be partly referred to the express teaching and example of Christ; partly, in so far as the virtue is manifested in the renunciation of external rank and dignity, or the glory of merely secular gifts and acquirements, it is one aspect of the unworldliness which we have already noticed; while the deeper humility that represses the claim of personal merit even in the saint belongs to the strict self-examination, the continual sense of imperfection, the utter reliance on strength not his own, which characterize the inner moral life of the Christian. Humility in this latter sense, "before God," is an essential condition of all truly Christian goodness.

We have, however, yet to notice the enlargement of the sphere of ethics due to its close connexion with theology; for while this added religious force and sanction to ordinary moral obligations, it equally tended to impart a moral aspect to religious belief and worship. "Duty to God"—as distinct from duty to man—had not been altogether unrecognized by pagan moralists; but the rather dubious

relations of even the more orthodox philosophy to the established polytheism had generally prevented them from laying much stress upon it. Again,—just as the Stoics held wisdom to be indispensable to real rectitude of conduct, while at the same time they included under the notion of wisdom a grasp of physical as well as ethical truth,—so the similar emphasis laid on inwardness in Christian ethics caused orthodoxy or correctness of religious belief to be regarded as essential to goodness, and heresy as the most fatal of vices, corrupting as it did the very springs of Christian life. To the philosophers (with the single exception of Plato), however, convinced as they were that the multitude must necessarily miss true well-being through their folly and ignorance, it could never occur to guard against these evils by any other method than that of providing philosophic instruction for the few; whereas the Christian clergy, whose function it was to offer truth and eternal life to all mankind, naturally regarded theological misbelief as insidious preventible contagion. Indeed, their sense of its deadliness was so keen that, when they were at length able to control the secular administration, they rapidly overcame their aversion to bloodshed, and initiated that long series of religious persecutions to which we find no parallel in the pre-Christian civilization of Europe. It was not that Christian writers did not feel the difficulty of attributing criminality to sincere ignorance or error. But the difficulty is not really peculiar to theology; and the theologians usually got over it (as some philosophers had surmounted a similar perplexity in the region of ethics proper) by supposing some latent or antecedent voluntary sin, of which the apparently involuntary heresy was the fearful fruit.

Lastly, we must observe that, in proportion as the legal conception of morality as a code of which the violation deserves supernatural punishment predominated over the philosophic view of ethics as the method for attaining natural felicity, the question of man's freedom of will to obey the law necessarily became prominent. At the same time it cannot be broadly said that Christianity took a decisive side in the metaphysical controversy on free-will and necessity; since, just as in Greek philosophy the need of maintaining freedom as the ground of responsibility clashes with the conviction that no one deliberately chooses his own harm, so in Christian ethics it clashes with the attribution of all true human virtue to supernatural grace, as well as with the belief in divine foreknowledge. All we can say is that in the development of Christian thought the conflict of conceptions was far more profoundly felt, and far more serious efforts were made to evade or transcend it.

Development of opinion in early Christianity.

In the preceding account of Christian morality, it has been already indicated that the characteristics delineated did not all exhibit themselves simultaneously to the same extent, or with perfect uniformity throughout the church. Changes in the external condition of Christianity, the different degrees of civilization in the societies of which it was the dominant religion, and the natural process of internal development, continually brought different features into prominence; while again, the important antagonisms of opinion within Christendom frequently involved ethical issues—even in the Eastern Church—until in the 4th century it began to be absorbed in the labour of a dogmatic construction. Thus, for example, the anti-secular tendencies of the new creed, to which Tertullian (160-220) gave violent and rigid expression, were exaggerated in the Montanist heresy which he ultimately joined; on the other hand, Clement of Alexandria, in opposition to the general tone of his age, maintained the value of pagan philosophy for the development of Christian faith into true knowledge (Gnosis), and the value of the natural development of man through marriage for the normal perfecting of the Christian life. So again, there is a marked difference between the writers before Augustine and those that succeeded him in all that concerns the internal conditions of Christian morality. By Justin and other apologists the need of redemption, faith, grace is indeed recognized, but the theological system depending on these notions is not sufficiently developed[18] to come into even apparent antagonism with the freedom of the will. Christianity is for the most part conceived as essentially a proclamation through the Divine Word, to immortal beings gifted with free choice, of the true code of conduct sanctioned by eternal rewards and punishments. This legalism contrasts strikingly with the efforts of pagan philosophy to exhibit virtue as its own reward; and the contrast is triumphantly pointed out by more than one early Christian writer. Lactantius (*circa* 300 A.D.), for example, roundly declares that Plato and Aristotle, referring everything to this earthly life, "made virtue mere folly"; though himself maintaining, with pardonable inconsistency, that man's highest good did not consist in mere pleasure, but in the consciousness of the filial relation of the soul to God. It is plain, however, that on this external legalistic view of duty it was impossible to maintain a difference in kind between Christian and pagan morality; the philosopher's conformity to the rules of chastity and beneficence, so far as it went, was indistinguishable from the saint's. But when this inference was developed in the teaching of Pelagius, it was repudiated as heretical by the church, under the powerful leadership of Augustine (354-430); and the doctrine of man's incapacity to obey God's law by his unaided moral energy was pressed to a point at which it was difficult to reconcile it with the freedom of the will. Augustine is fully aware of the theoretical indispensability of maintaining Free Will, from its logical connexion with human responsibility and divine justice; but he considers that these latter points are sufficiently secured if actual freedom of choice between good and evil is allowed in the single case of our progenitor Adam.[19] For since the *natura seminalis* from which all men were to arise already existed in Adam, in his voluntary preference of self to God, humanity chose evil once for all; for which ante-natal guilt all men are justly condemned to perpetual absolute sinfulness and consequent punishment, unless they are elected by God's unmerited grace to share the benefits of Christ's redemption. Without this grace it is impossible for man to obey the "first greatest commandment" of

Augustine.

love to God; and, this unfulfilled, he is guilty of the whole law, and is only free to choose between degrees of sin; his apparent external virtues have no moral value, since inner rightness of intention is wanting. “All that is not of faith is of sin”; and faith and love are mutually involved and inseparable; faith springs from the divinely imparted germ of love, which in its turn is developed by faith to its full strength, while from both united springs hope, joyful yearning towards ultimate perfect fruition of the object of love. These three Augustine (after St Paul) regards as the three essential elements of Christian virtue; along with these he recognizes the fourfold division of virtue into prudence, temperance, courage and justice according to their traditional interpretation; but he explains these virtues to be in their true natures only the same love to God in different aspects or exercises. The uncompromising mysticism of this view may be at once compared and contrasted with the philosophical severity of Stoicism. Love of God in the former holds the same absolute and unique position as the sole element of moral worth in human action, which, as we have seen, was occupied by knowledge of Good in the latter; and we may carry the parallel further by observing that in neither case is this severity in the abstract estimate of goodness necessarily connected with extreme rigidity in practical precepts. Indeed, an important part of Augustine’s work as a moralist lies in the reconciliation which he laboured to effect between the anti-worldly spirit of Christianity and the necessities of secular civilization. For example, we find him arguing for the legitimacy of judicial punishments and military service against an over-literal interpretation of the Sermon on the Mount; and he took an important part in giving currency to the distinction between evangelical “counsels” and “commands,” and so defending the life of marriage and temperate enjoyment of natural good against the attacks of the more extravagant advocate of celibacy and self-abnegation; although he fully admitted the superiority of the latter method of avoiding the contamination of sin.

Ambrose.

The attempt to Christianize the old Platonic list of virtues, which we have noticed in Augustine’s system, was probably due to the influence of his master Ambrose, in whose treatise *De officiis ministrorum* we find for the first time an exposition of Christian duty systematized on a plan borrowed from a pre-Christian moralist. It is interesting to compare Ambrose’s account of what subsequently came to be known as the “four cardinal virtues” with the corresponding delineations in Cicero’s[20] *De officiis* which served the bishop as a model. Christian Wisdom, so far as it is speculative, is of course primarily theological; it has God, as the highest truth, for its chief object, and is therefore necessarily grounded on faith. Christian Fortitude is essentially firmness in withstanding the seductions of good and evil fortune, resoluteness in the conflict perpetually waged against wickedness without carnal weapons—though Ambrose, with the Old Testament in his hand, will not quite relinquish the ordinary martial application of the term. “Temperantia” retains the meaning of “observance of due measure” in all conduct, which it had in Cicero’s treatise; though its notion is partly modified by being blended with the newer virtue of humility. Finally in the exposition of Christian Justice the Stoic doctrine of the natural union of all human interests is elevated to the full height and intensity of evangelical philanthropy; the brethren are reminded that the earth was made by God a common possession of all, and are bidden to administer their means for the common benefit; Ambrose, we should observe, is thoroughly aware of the fundamental union of these different virtues in Christianity, though he does not, like Augustine, resolve them all into the one central affection of love of God.

Ecclesiastical morality in the “Dark Ages.”

Under the influence of Ambrose and Augustine, the four cardinal virtues furnished a basis on which the systematic ethical theories of subsequent theologians were built. With them the triad of Christian graces, Faith, Hope and Love, and the seven gifts of the Spirit (Isaiah xi. 2) were often combined. In antithesis to this list, an enumeration of the “deadly sins” obtained currency. These were at first commonly reckoned as eight; but a preference for mystical numbers characteristic of medieval theologians finally reduced them to seven. The statement of them is variously given,—Pride, Avarice, Anger, Gluttony, Unchastity, are found in all the lists; the remaining two (or three) are variously selected from among Envy, Vainglory, and the rather singular sins Gloominess (*tristitia*) and Languid Indifference (*acidia* or *acedia*, from Gr. ἀκηδία). These latter notions show plainly, what indeed might be inferred from a study of the list as a whole, that it represents the moral experience of the monastic life, which for some centuries was more and more unquestioningly regarded as in a peculiar sense “religious.” It should be observed that the (also Augustinian) distinction between “deadly” and “venial” sins had a technical reference to the quasi-jural administration of ecclesiastical discipline, which grew gradually more organized as the spiritual power of the church established itself amid the ruins of the Western empire, and slowly developed into the theocracy that almost dominated Europe during the latter part of the middle ages. “Deadly” sins were those for which formal ecclesiastical penance was held to be necessary, in order to save the sinner from eternal damnation; for “venial” sins he might obtain forgiveness, through prayer, almsgiving, and the observance of the regular fasts. We find that “penitential books” for the use of the confessional, founded partly on traditional practice and partly on the express decrees of synods, come into general use in the 7th century. At first they are little more than mere inventories of sins, with their appropriate ecclesiastical punishments; gradually cases of conscience come to be discussed and decided, and the basis is laid for that system of casuistry which reached its full development in the 14th and 15th centuries. This ecclesiastical jurisprudence, and indeed the general relation of the church to the ruder races with which it had to deal during this period, necessarily tended to encourage a somewhat external view of morality. But a powerful counterpoise to this tendency was continually maintained by the fervid inwardness of Augustine, transmitted through Gregory the Great, Isidore of Seville, Alcuin, Hrabanus Maurus, and other writers of the philosophically barren period between the destruction of the Western empire and

the rise of Scholasticism.

Scholastic ethics, like scholastic philosophy, attained its completest result in the teaching of Thomas Aquinas. But before giving a brief account of the ethical part of his system, it will be well to notice the salient points in the long and active discussion that led up to it. In the pantheistic system of Erigena (*q.v.*) (*circa* 810-877) the chief philosophic element is supplied by the influence of Plato and Plotinus, transmitted through an unknown author of the 5th century, who assumed the name of Dionysius the Areopagite. Accordingly the ethical side of this doctrine has the same negative and ascetic character that we have observed in Neoplatonism. God is the only real Being; evil is essentially unreal and incognizable; the true aim of man's life is to return to perfect union with God out of the degraded material existence into which he has fallen. This doctrine found little acceptance among Erigena's contemporaries, and was certainly unorthodox enough to justify the condemnation which it subsequently received from Honorius III.; but its influence, together with that of the Pseudo-Dionysius, had a considerable share in developing the more emotional orthodox mysticism of the 12th and 13th centuries; and Neoplatonism (or Platonism received through a Neoplatonic tradition) remained a distinct element in medieval thought, though obscured in the period of mature scholasticism by the predominant influence of Aristotle. Passing on to Anselm (1033-1109), we observe that the Augustinian doctrine of original sin and man's absolute need of unmerited grace is retained in his theory of salvation; he also follows Augustine in defining freedom as the "power not to sin"; though in saying that Adam fell "spontaneously" and "by his free choice," though not "through its freedom," he has implicitly made the distinction that Peter the Lombard afterwards expressly draws between the freedom that is opposed to necessity and freedom from the slavery to sin. Anselm further softens the statement of Augustinian predestinationism by explaining that the freedom to will is not strictly lost even by fallen man; it is inherent in a rational nature, though since Adam's sin it only exists potentially in humanity, except where it is made actual by grace.

Medieval moral philosophy.

In a more real sense Abelard (1079-1142) tries to establish the connexion between man's ill desert and his free consent. He asserts that the inherited propensity to evil is not strictly a sin, which is only committed when the conscious self yields to vicious inclination. With a similar stress on the self-conscious side of moral action, he argues that rightness of conduct depends solely on the intention, at one time pushing this doctrine to the paradoxical assertion that all outward acts as such are indifferent.[21] In the same spirit, under the reviving influence of ancient philosophy (with which, however, he was imperfectly acquainted and the relation of which to Christianity he extravagantly misunderstood), he argues that the old Greek moralists, as inculcating a disinterested love of good—and so implicitly love of God as the highest good—were really nearer to Christianity than Judaic legalism was. Nay, further, he required that the Christian "love to God" should be regarded as pure only if purged from the self-regarding desire of the happiness which God gives. The general tendency of Abelard's thought was suspiciously regarded by contemporary orthodoxy;[22] and the over-subtlety of the last-mentioned distinction provoked vehement replies from orthodox mystics of the age. Thus, Hugo of St Victor (1077-1141) argues that all love is necessarily so far "interested" that it involves a desire for union with the beloved; and since eternal happiness consists in this union, it cannot truly be desired apart from God; while Bernard of Clairvaux (1091-1153) more elaborately distinguishes four stages by which the soul is gradually led from (1) merely self-regarding desire for God's aid in distress, to (2) love him for his loving-kindness to it, then also (3) for his absolute goodness, until (4) in rare moments this love for himself alone becomes the sole all-absorbing affection. This controversy Peter the Lombard endeavoured to compose by the scholastic art of taking distinctions, of which he was a master. In his treatise, *Libri sententiarum*, mainly based on Augustinian doctrine, we find a distinct softening of the antithesis between nature and grace and an anticipation of the union of Aristotelian and Christian thought, which was initiated by Albert the Great and completed by Thomas Aquinas.

The moral philosophy of Aquinas is Aristotelianism with a Neoplatonic tinge, interpreted and supplemented by a view of Christian dogma derived chiefly from Augustine. All action or movement of all things irrational as well as rational is directed towards some end or good,—that is, really and ultimately towards God himself, the ground and first cause of all being, and unmoved principle of all movement. This universal though unconscious striving after God, since he is essentially intelligible, exhibits itself in its highest form in rational beings as a desire for knowledge of him; such knowledge, however, is beyond all ordinary exercise of reason, and may be only partially revealed to man here below. Thus the *summum bonum* for man is objectively God, subjectively the happiness to be derived from loving vision of his perfections; although there is a lower kind of happiness to be realized here below in a normal human existence of virtue and friendship, with mind and body sound and whole and properly trained for the needs of life. The higher happiness is given to man by free grace of God; but it is given to those only whose heart is right, and as a reward of virtuous actions. Passing to consider what actions are virtuous, we first observe generally that the morality of an act is in part, but only in part, determined by its particular motive; it partly depends on its external object and circumstances, which render it either objectively in harmony with the "order of reason" or the reverse. In the classification of particular virtues and vices we can distinguish very clearly the elements supplied by the different teachings which Aquinas has imbibed. He follows Aristotle closely in dividing the "natural" virtues into intellectual and moral, giving his preference to the former class, and the intellectual again into speculative and practical; in distinguishing within the speculative class the "intellect" that is

Thomas Aquinas.

conversant with principles, the “science” that deduces conclusions, and the “wisdom” to which belongs the whole process of knowing the sublimest objects of knowledge; and in treating practical wisdom as inseparably connected with moral virtues, and therefore in a sense moral. His distinction among moral virtues of the justice that renders others their due from the virtues that control the appetites and passions of the agent himself, represents his interpretation of the *Nicomachean Ethics*; while his account of these latter virtues is a simple transcript of Aristotle’s, just as his division of the non-rational element of the soul into “concupiscible” and “irascible” is the old Platonic one. In arranging his list, however, he defers to the established doctrine of the four cardinal virtues (derived from Plato and the Stoics through Cicero); accordingly, the Aristotelian ten have to stand under the higher genera of (1) the prudence which gives reasoned rules of conduct, (2) the temperance which restrains misleading desire, and (3) the fortitude that resists misleading fear of dangers or toils. But before these virtues are ranked the three “theologic” virtues, faith, love and hope, supernaturally “instilled” by God, and directly relating to him as their object. By faith we obtain that part of our knowledge of God which is beyond the range of mere natural wisdom or philosophy; naturally (*e.g.*), we can know God’s existence, but not his trinity in unity, though philosophy is useful to defend this and other revealed verities; and it is essential for the soul’s welfare that all articles of the Christian creed, however little they can be known by natural reason, should be apprehended through faith; the Christian who rejects a single article loses hold altogether of faith and of God. Faith is the substantial basis of all Christian morality, but without love—the essential form of all the Christian virtues—it is “formless” (*informis*). Christian love is conceived (after Augustine) as primarily love to God (beyond the natural yearning of the creature after its ultimate good), which expands into love towards all God’s creatures as created by him, and so ultimately includes even self-love. But creatures are only to be loved in their purity as created by God; all that is bad in them must be an object of hatred till it is destroyed. In the classification of sins the Christian element predominates; still we find the Aristotelian vices of excess and defect, along with the modern divisions into “sins against God, neighbour and self,” “mortal and venial sins,” and so forth.

From the notion of sin—treated in its jural aspect—Aquinas passes naturally to the discussion of Law. The exposition of this conception presents to a great extent the same matter that was dealt with by the exposition of moral virtues, but in a different form; the prominence of which may perhaps be attributed to the growing influence of Roman jurisprudence, which attained in the 12th century so rapid and brilliant a revival in Italy. This side of Thomas’s system is specially important, since it is just this blending of theological conceptions with the abstract theory of the later Roman law that gave the starting-point for independent ethical thought in the modern world. Under the general idea of law, defined as an “ordinance of reason for the common good, promulgated by him who has charge of the community,” Thomas distinguishes (1) the eternal law or regulative reason of God which embraces all his creatures, rational and irrational; (2) “natural law,” being that part of the eternal law that relates to rational creatures as such; (3) human law, which properly consists of more particular deductions from natural law particularized and adapted to the varying circumstances of actual communities; (4) divine law specially revealed to man. As regards natural law, he teaches that God has implanted in the human mind a knowledge of its immutable general principles; and not only knowledge, but a disposition, to which he applies the peculiar scholastic name *synderesis*,[23] that unerringly prompts to the realization of these principles in conduct, and protests against their violation. All acts of natural virtue are implicitly included within the scope of this law of nature; but in the application of its principles to particular cases—to which the term “conscience” should be restricted—man’s judgment is liable to err, the light of nature being obscured and perverted by bad education and custom. Human law is required, not merely to determine the details for which natural law gives no intuitive guidance, but also to supply the force necessary for practically securing, among imperfect men, the observance of the most necessary rules of mutual behaviour. The rules of this law must be either deductions from principles of natural law, or determinations of particulars which it leaves indeterminate; a rule contrary to nature could not be valid as law at all. Human law, however, can deal with outward conduct alone, and natural law, as we have seen, is liable to be vague and obscure in particular applications. Neither natural nor human law, moreover, takes into account that supernatural happiness which is man’s highest end. Hence they need to be supplemented by a special revelation of divine law. This revelation is distinguished into the law of the old covenant and the law of the gospel; the latter of these is productive as well as imperative since it carries with it the divine grace that makes its fulfilment possible. We have, however, to distinguish in the case of the gospel between (1) absolute commands and (2) “counsels,” which latter recommend, without positively ordering the monastic life of poverty, celibacy and obedience as the best method of effectively turning the will from earthly to heavenly things.

But how far is man able to attain either natural or Christian perfection? This is the part of Thomas’s system in which the cohesion of the different elements seems weakest. He is scarcely aware that his Aristotelianized Christianity inevitably combines two different difficulties in dealing with this question: first, the old pagan difficulty of reconciling the proposition that will is a rational desire always directed towards apparent good, with the freedom of choice between good and evil that the jural view of morality seems to require; and, secondly, the Christian difficulty of harmonizing this latter notion with the absolute dependence on divine grace which the religious consciousness affirms. The latter difficulty Thomas, like many of his predecessors, avoids by supposing a “co-operation” of free-will and grace, but the former he does not fully meet. It is against this part of his doctrines that the most important criticism, in ethics, of his rival Duns Scotus (*c.* 1266-1308) was directed. He urged that will could not be really free if it were bound to reason, as Thomas (after

Duns Scotus. Aristotle) conceives it; a really free choice must be perfectly indeterminate between reason and unreason. Scotus consistently maintained that the divine will is similarly independent of reason, and that the divine ordering of the world is to be conceived as absolutely arbitrary. On this point he was followed by the acute intellect of William of Occam (d. *c.* 1347). This doctrine is obviously hostile to all reasoned morality; and in fact, notwithstanding the dialectical ability of Scotus and Occam, the work of Thomas remained indubitably the crowning result of the great constructive effort of medieval philosophy. The effort was, indeed, foredoomed to failure, since it attempted the impossible task of framing a coherent system out of the heterogeneous data furnished by Scripture, the fathers, the church and Aristotle—equally unquestioned, if not equally venerated, authorities. Whatever philosophic quality is to be found in the work of Thomas belongs to it in spite of, not in consequence of, its method. Still, its influence has been great and long-enduring,—in the Catholic Church primarily, but indirectly among Protestants, especially in England, since the famous first book of Hooker's *Ecclesiastical Polity* is to a great extent taken from the *Summa theologiae*.

William of Occam.

Partly in conscious antagonism to the schoolmen, yet with close affinity to the central ethico-theological doctrine which they read out of or into Aristotle, the mystical manner of thought continued to maintain itself in the church. Philosophically it rested upon Neoplatonism, but its development in strict connexion with Christian orthodoxy begins in the 12th century with Bernard of Clairvaux and Hugo of St Victor. It blended the Christian element of love with the ecstatic vision of Plotinus, sometimes giving the former a decided predominance. In its more moderate form, keeping wholly within the limits of ecclesiastical orthodoxy, this mysticism is represented by Bonaventura and Gerson; while it appears more independent and daringly constructive in the German Eckhart, advancing in some of his followers to open breach with the church, and even to practical immorality.

Medieval mysticism.

In the brief account above given of the general ethical view of Thomas Aquinas no mention has been made of the detailed discussion of particular duties included in the *Summa theologiae*; in which, for the most part, an excellent combination of moral elevation with sobriety of judgment is shown, though on certain points the scholastic pedantry of definition and distinction is unfavourable to due delicacy of treatment. As the properly philosophic interest of scholasticism faded in the 14th and 15th centuries, the quasi-legal treatment of morality came again into prominence, borrowing a good deal of matter from Thomas and other schoolmen. One result of this was a marked development and systematization of casuistry. The best known *Summae casuum conscientiae*, compiled for the conduct of auricular confession, belong to the 14th and 15th centuries. The oldest, the *Astesana*, from Asti in Piedmont, is arranged as a kind of text-book of morality on a scholastic basis; later manuals are merely lists of questions and answers. It was inevitable that, in proportion as this casuistry assumed the character of a systematic penal jurisprudence, its precise determination of the limits between the prohibited and the allowable, with all doubtful points closely scrutinized and illustrated by fictitious cases, would have a tendency to weaken the moral sensibilities of ordinary minds; the greater the industry spent in deducing conclusions from the diverse authorities, the greater necessarily became the number of points on which doctors disagreed; and the central authority that might have repressed serious divergences was wanting in the period of moral weakness[24] that the church went through after the death of Boniface VIII. A plain man perplexed by such disagreements might naturally hold that any opinion maintained by a pious and orthodox writer must be a safe one to follow; and thus weak consciences were subtly tempted to seek the support of authority for some desired relaxation of a moral rule. It does not, however, appear that this danger assumed formidable proportions until after the Reformation; when, in the struggle made by the Catholic church to recover its hold on the world, the principle of authority was, as it were, forced into keen, balanced and prolonged conflict with that of reliance on private judgment. To the Jesuits, the foremost champions in this struggle, it seemed indispensable that the confessional should be made attractive; for this purpose ecclesiastico-moral law must be somehow "accommodated" to worldly needs; and the theory of "Probabilism" supplied a plausible method for effecting this accommodation. The theory proceeded thus: A layman could not be expected to examine minutely into a point on which the learned differed; therefore he could not fairly be blamed for following any opinion that rested on the authority of even a single doctor; therefore his confessor must be authorized to hold him guiltless if any such "probable" opinion could be produced in his favour; nay, it was his duty to suggest such an opinion, even though opposed to his own, if it would relieve the conscience under his charge from a depressing burden. The results to which this Probabilism, applied with an earnest desire to avoid dangerous rigour, led in the 17th century were revealed to the world in the immortal *Lettres provinciales* of Pascal.

Casuistry.

The Jesuits.

In tracing the development of casuistry we have been carried beyond the great crisis through which Western Christianity passed in the 16th century. The Reformation which Luther initiated may be viewed on several sides, even if we consider only its ethical principles and effects. It maintained the simplicity of Apostolic Christianity against the elaborate system of a corrupt hierarchy, the teaching of Scripture alone against the commentaries of the fathers and the traditions of the church, the right of private judgment against the dictation of ecclesiastical authority, the individual responsibility of every human soul before God in opposition to the papal control over purgatorial punishments, which had led to the revolting degradation of venal indulgences. Reviving the original

The Reformation. Transition to modern ethical philosophy.

antithesis between Christianity and Jewish legalism, it maintained the inwardness of faith to be the sole way to eternal life, in contrast to the outwardness of works; returning to Augustine, and expressing his spirit in a new formula, to resist the Neo-Pelagianism that had gradually developed itself within the apparent Augustinianism of the church, it maintained the total corruption of human nature, as contrasted with that "congruity" by which, according to the schoolmen, divine grace was to be earned; renewing the fervent humility of St Paul, it enforced the universal and absolute imperativeness of all Christian duties, and the inevitable unworthiness of all Christian obedience, in opposition to the theory that "condign" merit might be gained by "supererogatory" conformity to evangelical "counsels." It will be seen that these changes, however profoundly important, were, ethically considered, either negative or quite general, relating to the tone and attitude of mind in which all duty should be done. As regards all positive matter of duty and virtue, and most of the prohibitive code for ordinary men, the tradition of Christian teaching was carried on substantially unchanged by the Reformed churches. Even the old method of casuistry was maintained[25] during the 16th and 17th centuries; though Scriptural texts, interpreted and supplemented by the light of natural reason, now furnished the sole principles on which cases of conscience were decided.

In the 17th century, however, the interest of this quasi-legal treatment of morality gradually faded; and the ethical studies of educated minds were occupied with the attempt, renewed after so many centuries, to find an independent philosophical basis for the moral code. The renewal of this attempt was only indirectly due to the Reformation; it is rather to be connected with the more extreme reaction from the medieval religion which was partly caused by, partly expressed in, that enthusiastic study of the remains of old pagan culture that spread from Italy over Europe in the 15th and 16th centuries. To this "humanism" the Reformation seemed at first more hostile than the Roman hierarchy; indeed, the extent to which this latter had allowed itself to become paganized by the Renaissance was one of the points that especially roused the Reformers' indignation. Not the less important is the indirect stimulus given by the Reformation towards the development of a moral philosophy independent alike of Catholic and Protestant assumptions. Scholasticism, while reviving philosophy as a handmaid to theology, had metamorphosed its method into one resembling that of its mistress; thus shackling the renascent intellectual activity which it stimulated by the double bondage to Aristotle and to the church. When the Reformation shook the traditional authority in one department, the blow was necessarily felt in the other. Not twenty years after Luther's defiance of the pope, the startling thesis "that all that Aristotle taught was false" was prosperously maintained by the youthful Ramus before the university of Paris; and almost contemporaneously the group of remarkable thinkers in Italy who heralded the dawn of modern physical science—Cardanus, Telesio, Patrizzi, Campanella, Bruno—began to propound their Aristotelian theories of the constitution of the physical universe. It was to be foreseen that a similar assertion of independence would make itself heard in ethics also; and, indeed, amid the clash of dogmatic convictions, and the variations of private judgment, it was natural to seek for an ethical method that might claim universal acceptance from all sects.

Humanism.

C. *Modern Ethics*.—The need of such independent principles was most strongly felt in the region of man's civil and political relations, especially the mutual relations of communities. Accordingly we find that modern ethical controversy began in a discussion of the law of nature. Albericus Gentilis (1557-1611) and Hugo Grotius (1583-1645) were the first to give a systematic account. Natural law, according to Grotius and other writers of the age, is that part of divine law which follows from the essential nature of man, who is distinguished from animals by his "appetite" for tranquil association with his fellows, and his tendency to act on general principles. It is therefore as unalterable, even by God himself, as the truths of mathematics, although its effect may be overruled in any particular case by an express command of God; hence it is cognizable *a priori*, from the abstract consideration of human nature, though its existence may be known *a posteriori* also from its universal acceptance in human societies. The conception, as we have seen, was taken from the later Roman jurists; by them, however, the law of nature was conceived as something that underlay existing law, and was to be looked for through it, though it might ultimately supersede it, and in the meanwhile represented an ideal standard, by which improvements in legislation were to be guided. Still the language of the jurists in some passages (cf. *Inst. of Justinian*, ii. 1, 2) clearly implied a period of human history in which men were governed by natural law alone, prior to the institution of civil society. Posidonius had identified this period with the mythical "golden age"; and such ideas easily coalesced with the narrative in Genesis. Thus there had become current the conception of a "state of nature" in which individuals or single families lived side by side—under none other than those "natural" laws which prohibited mutual injury and interference in the free use of the goods of the earth common to all, and upheld parental authority, fidelity of wives, and the observance of compacts freely made. This conception Grotius took, and gave it additional force and solidity by using the principles of this natural law for the determination of international rights and duties, it being obvious that independent nations, in their corporate capacities, were still in that "state of nature" in their mutual relations. It was not, of course, assumed that these laws were universally obeyed; indeed, one point with which Grotius is especially concerned is the natural right of private war, arising out of the violation of more primary rights. Still a general observance was involved in the idea of a natural law as a "dictate of right reason indicating the agreement or disagreement of an act with man's rational and social nature"; and we may observe that it was especially necessary to assume such a general observance in the case of contracts, since it was by an "express or tacit pact" that the right of property (as distinct from the mere right to non-interference

Grotius.

during use) was held by him to have been instituted. A similar "fundamental pact" had long been generally regarded as the normal origin of legitimate sovereignty.

The ideas above expressed were not peculiar to Grotius; in particular the doctrine of the "fundamental pact" as the jural basis of government had long been maintained, especially in England, where the constitution historically established readily suggested such a compact. At the same time the rapid and remarkable success of Grotius's treatise (*De jure belli et pacis*) brought his view of Natural Right into prominence, and suggested such questions as—"What is man's ultimate reason for obeying these laws? Wherein exactly does this their agreement with his rational and social nature consist? How far, and in what sense, is his nature really social?"

Hobbes.

It was the answer which Hobbes (1588-1679) gave to these fundamental questions that supplied the starting-point for independent ethical philosophy in England. The nature of this answer was determined by the psychological views to which Hobbes had been led, possibly to some extent under the influence of Bacon,[26] partly perhaps through association with his younger contemporary Gassendi, who, in two treatises, published between the appearance of Hobbes's *De cive* (1642) and that of the *Leviathan* (1651), endeavoured to revive interest in Epicurus. Hobbes's psychology is in the first place materialistic; he holds, that is, that in any of the psycho-physical phenomena of human nature the reality is a material process of which the mental feeling is a mere "appearance." Accordingly he regards pleasure as essentially motion "helping vital action," and pain as motion "hindering" it. There is no logical connexion between this theory and the doctrine that appetite of desire has always pleasure (or the absence of pain) for its object; but a materialist, framing a system of psychology, will naturally direct his attention to the impulses arising out of bodily wants, whose obvious end is the preservation of the agent's organism; and this, together with a philosophic wish to simplify, may lead him to the conclusion that all human impulses are similarly self-regarding. This, at any rate, is Hobbes's cardinal doctrine in moral psychology, that each man's appetites or desires are naturally directed either to the preservation of his life, or to that heightening of it which he feels as pleasure.[27] Hobbes does not distinguish instinctive from deliberate pleasure-seeking; and he confidently resolves the most apparently unselfish emotions into phases of self-regard. Pity he finds to be grief for the calamity of others, arising from imagination of the like calamity befalling oneself; what we admire with seeming disinterestedness as beautiful (*pulchrum*) is really "pleasure in promise"; when men are not immediately seeking present pleasure, they desire power as a means to future pleasure, and thus have a derivative delight in the exercise of power that prompts to what we call benevolent action. Since, then, all the voluntary actions of men tend to their own preservation or pleasure, it cannot be reasonable to aim at anything else; in fact, nature rather than reason fixes this as the end of human action; it is reason's function to show the means. Hence if we ask why it is reasonable for any individual to observe the rules of social behaviour that are commonly called moral, the answer is obvious that this is only indirectly reasonable, as a means to his own preservation or pleasure. It is not, however, in this, which is only the old Cyrenaic or Epicurean answer, that the distinctive point of Hobbism lies. It is rather in the doctrine that even this indirect reasonableness of the most fundamental moral rules is entirely conditional on their general observance, which cannot be secured apart from government. For example, it is not reasonable for me to perform my share of a contract, unless I have reason for believing that the other party will perform his; and this I cannot have, except in a society in which he will be punished for non-performance. Thus the ordinary rules of social behaviour are only hypothetically obligatory; they are actualized by the establishment of a "common power" that may "use the strength and means of all" to enforce on all the observance of rules tending to the common benefit. On the other hand Hobbes yields to no one in maintaining the paramount importance of moral regulations. The precepts of good faith, equity, requital of benefits, forgiveness of wrong so far as security allows, the prohibition of contumely, pride, arrogance,—which may all be summed up in the formula, "Do not that to another which thou wouldest not have done to thyself" (*i.e.* the negative of the "golden rule")—he still calls "immutable and eternal laws of nature"—meaning that, though a man is not unconditionally bound to realize them, he is, as a reasonable being, bound to desire that they should be realized. The pre-social state of man, in his view, is also pre-moral; but it is therefore utterly miserable. It is a state in which every one has a right to everything that may conduce to his preservation;[28] but it is therefore also a state of war—a state so wretched that it is the first dictate of rational self-love to emerge from it into social peace and order. Hence Hobbes's ideal constitution naturally comes to be an unquestioned and unlimited—though not necessarily monarchical—despotism. Whatever the government declares to be just or unjust must be accepted as such, since to dispute its dictates would be the first step towards anarchy, the one paramount peril outweighing all particular defects in legislation and administration. It is perhaps easy to understand how, in the crisis of 1640, when the ethico-political system of Hobbes first took written shape, a peace-loving philosopher should regard the claims of individual conscience as essentially anarchical, and dangerous to social well-being; but however strong might be men's yearning for order, a view of social duty, in which the only fixed positions were selfishness everywhere and unlimited power somewhere, could not but appear offensively paradoxical.

There was, however, in his theory an originality, a force, an apparent coherence which rendered it undeniably impressive; in fact, we find that for two generations the efforts to construct morality on a philosophical basis take more or less the form of answers to Hobbes. From an ethical point of view Hobbism divides itself naturally into two parts, which by Hobbes's peculiar political doctrines are combined into a coherent whole, but are not otherwise necessarily connected. Its theoretical basis is

the principle of egoism; while, for practically determining the particulars of duty it makes morality entirely dependent on positive law and institution. It thus affirmed the relativity of good and evil in a double sense; good and evil, for any individual citizen, may from one point of view be defined as the objects respectively of his desire and his aversion; from another, they may be said to be determined for him by his sovereign. It is this latter aspect of the system which is primarily attacked by the first generation of writers that replied to Hobbes. This attack, or rather the counter-exposition of orthodox doctrine, is conducted on different methods by the Cambridge moralists and by Cumberland respectively. Cumberland is content with the legal view of morality, but endeavours to establish the validity of the laws of nature by taxing them on the single supreme principle of rational regard for the "common good of all," and showing them, as so based, to be adequately supported by the divine sanction. The Cambridge school, regarding morality primarily as a body of truth rather than a code of rules, insist on its absolute character and intuitive certainty.

The Cambridge moralists, Cudworth.

Cudworth was the most distinguished of the little group of thinkers at Cambridge in the 17th century, commonly known as the Cambridge Platonists (*q.v.*). In his treatise on *Eternal and Immutable Morality* his main aim is to maintain the "essential and eternal distinctions of good and evil" as independent of mere will, whether human or divine. These distinctions, he insists, have an objective reality, cognizable by reason no less than the relations of space or number; and he endeavours to refute Hobbism—which he treats as a "novantique philosophy," a mere revival of the relativism of Protagoras—chiefly by the following *argumentum ad hominem*. He argues that Hobbes's atomic materialism involves the conception of an objective physical world, the object not of passive sense that varies from man to man, but of the active intellect that is the same in all; there is therefore, he urges, an inconsistency in refusing to admit a similar exercise of intellect in morals, and an objective world of right and wrong, which the mind by its normal activity clearly apprehends as such.

More.

Cudworth, in the work above mentioned, gives no systematic exposition of the ethical principles which he holds to be thus intuitively apprehended. But we may supply this deficiency from the *Enchiridion Ethicum* of Henry More, another thinker of the same school. More gives a list of 23 *Noemata Moralia*, the truth of which will, he says, be immediately manifest. Some of these admit of a purely egoistic application, and appear to be so understood by the author—as (*e.g.*) that goods differ in quality as well as in duration, and that the superior good or the lesser evil is always to be preferred; that absence of a given amount of good is preferable to the presence of equivalent evil; that future good or evil is to be regarded as much as present, if equally certain, and nearly as much if very probable. Objections, both general and special, might be urged by a Hobbist against these modes of formulating man's natural pursuit of self-interest; but the serious controversy between Hobbism and modern Platonism related not to such principles as these, but to others which demand from the individual a (real or apparent) sacrifice for his fellows. Such are the evangelical principle of "doing as you would be done by"; the principle of justice, or "giving every man his own, and letting him enjoy it without interference"; and especially what More states as the abstract formula of benevolence, that "if it be good that one man should be supplied with the means of living well and happily, it is mathematically certain that it is doubly good that two should be so supplied, and so on." The question, however, still remains, what motive any individual has to conform to these social principles when they conflict with his natural desires. To this Cudworth gives no explicit reply, and the answer of More is hardly clear. On the one hand he maintains that these principles express an absolute good, which is to be called intellectual because its essence and truth are apprehended by the intellect. We might infer from this that the intellect, so judging, is itself the proper and complete determinant of the will, and that man, as a rational being, ought to aim at the realization of absolute good for its own sake. In spite, however, of possible inferences from his definition of virtue, this does not seem to be really More's view. He explains that though absolute good is discerned by the intellect, the "sweetness and flavour" of it is apprehended, not by the intellect proper, but by what he calls a "boniform faculty"; and it is in this sweetness and flavour that the motive to virtuous conduct lies; ethics is the "art of living well and happily," and true happiness lies in "the pleasure which the soul derives from the sense of virtue." In short, More's Platonism appears to be really as hedonistic as Hobbism; only the feeling to which it appeals as ultimate motive is of a kind that only a mind of exceptional moral refinement can habitually feel with the decisive intensity required.

Cumberland.

It is to be observed that though More lays down the abstract principle of regarding one's neighbour's good as much as one's own with the full breadth with which Christianity inculcates it, yet when he afterwards comes to classify virtues he is too much under the influence of Platonic-Aristotelian thought to give a distinct place to benevolence, except under the old form of liberality. In this respect his system presents a striking contrast to Cumberland's, whose treatise *De Legibus Naturae* (1672), though written like More's in Latin, is yet in its ethical matter thoroughly modern. Cumberland is a thinker both original and comprehensive, and, in spite of defects in style and clearness, he is noteworthy as having been the first to lay down that "regard for the common good of all" is the supreme rule of morality or law of nature. So far he may be fairly called the precursor of later utilitarianism. His fundamental principle and supreme "Law of Nature" is thus stated: "The greatest possible benevolence of every rational agent towards all the rest constitutes the happiest state of each and all, so far as depends on their own power, and is necessarily required for their happiness; accordingly Common Good will be the Supreme Good." It is, however, important to notice that in his "good" is included not merely

happiness but “perfection”; and he does not even define perfection so as to exclude from it the notion of absolute moral perfection and save his theory from an obvious logical circle. A notion so vague could not possibly be used with any precision for determining the subordinate rules of morality; but in fact Cumberland does not attempt this; his supreme principle is designed not to rectify, but merely to support and systematize, common morality. This principle, as was said, is conceived as strictly a law, and therefore referred to a lawgiver, God, and provided with a sanction in its effects on the agent’s happiness. That the divine will is expressed by it, Cumberland, “not being so fortunate as to possess innate ideas,” tries to prove by a long inductive examination of the evidences of man’s essential sociality exhibited in his physical and mental constitution. His account of the sanction, again, is sufficiently comprehensive, including both the internal and the external rewards of virtue and punishments of vice; and he, like later utilitarians, explains moral obligation to lie in the force exercised on the will by these sanctions; but as to the precise manner in which individual is implicated with universal good, and the operation of either or both in determining volition, his view is indistinct if not actually inconsistent.

Locke.

The clearness which we seek in vain from Cumberland is found to the fullest extent in Locke, whose *Essay on the Human Understanding* (1690) was already planned when Cumberland’s treatise appeared. Yet Locke’s ethical opinions have been widely misunderstood; since from a confusion between “innate ideas” and “intuitions,” which has been common in recent ethical discussion, it has been supposed that the founder of English empiricism must necessarily have been hostile to “intuitional” ethics. The truth is that, while Locke agrees entirely with Hobbes as to the egoistic basis of rational conduct, and the interpretation of “good” and “evil” as “pleasure” and “pain,” or that which is productive of pleasure and pain, he yet agrees entirely with Hobbes’s opponents in holding ethical rules to be actually obligatory independently of political society, and capable of being scientifically constructed on principles intuitively known,—though he does not regard these principles as implanted in the mind at birth. The aggregate of such rules he conceives as the law of God, carefully distinguishing it, not only from civil law, but from the law of opinion or reputation, the varying moral standard by which men actually distribute praise and blame; as being divine it is necessarily sanctioned by adequate rewards and punishments. He does not, indeed, speak of the scientific construction of this code as having been actually effected, but he affirms its possibility in language remarkably strong and decisive. “The idea,” he says, “of a Supreme Being, infinite in power, goodness, and wisdom, whose workmanship we are, and upon whom we depend, and the idea of ourselves, as understanding rational beings, being such as are clear in us, would, I suppose, if duly considered and pursued, afford such foundations of our duty and rules of action, as might place morality among the sciences capable of demonstration; wherein, I doubt not, but from self-evident propositions, by necessary consequences as incontestable as those in mathematics, the measure of right and wrong might be made out.” As Locke cannot consistently mean by God’s “goodness” anything but the disposition to give pleasure, it might be inferred that the ultimate standard of right rules of action ought to be the common happiness of the beings affected by the action; but Locke does not explicitly adopt this standard. The only instances which he gives of intuitive moral truths are the purely formal propositions, “No government allows absolute liberty,” and “Where there is no property there is no injustice,”—neither of which has any evident connexion with the general happiness. As regards his conception of the Law of Nature, he takes it in the main immediately from Grotius and Pufendorf, more remotely from the Stoics and the Roman jurists.

Clarke.

We might give, as a fair illustration of Locke’s general conception of ethics, a system which is frequently represented as diametrically opposed to Lockism; namely, that expounded in Clarke’s Boyle lectures on the *Being and Attributes of God* (1704). It is true that Locke is not particularly concerned with the ethico-theological proposition which Clarke is most anxious to maintain,—that the fundamental rules of morality are independent of arbitrary will, whether divine or human. But in his general view of ethical principles as being, like mathematical principles,[29] essentially truths of relation, Clarke is quite in accordance with Locke; while of the four fundamental rules that he expounds, Piety towards God, Equity, Benevolence and Sobriety (which includes self-preservation), the first is obtained, just as Locke suggests, by “comparing the idea” of man with the idea of an infinitely good and wise being on whom he depends; and the second and third are axioms self-evident on the consideration of the equality or similarity of human individuals as such. The principle of equity—that “whatever I judge reasonable or unreasonable for another to do for me, that by the same I declare reasonable or unreasonable that I in the like case should do for him,” is merely a formal statement of the golden rule of the gospel. We may observe that, in stating the principle of benevolence, “since the greater good is always most fit and reasonable to be done, every rational creature ought to do all the good it can to its fellow-creatures,” Clarke avowedly follows Cumberland, from whom he quotes the further sentence that “universal love and benevolence is as plainly the most direct, certain and effectual means to this good as the flowing of a point is to produce a line.” The quotation may remind us that the analogy between ethics and mathematics ought to be traced further back than Locke; in fact, it results from the influence exercised by Cartesianism over English thought generally, in the latter half of the 17th century. It must be allowed that Clarke is misled by the analogy to use general ethical terms (“fitness,” “agreement” of things, &c.), which overlook the essential distinction between what is and what ought to be; and even in one or two expressions to overleap this distinction extravagantly, as (*e.g.*) in saying that the man who “wilfully acts contrary to justice wills things to be what they are not and cannot be.” What he really means is less paradoxically stated in the general proposition that “originally and in reality it is natural and (morally speaking) necessary that the will should be

determined in every action by the reason of the thing and the right of the case, as it is natural and (absolutely speaking) necessary that the understanding should submit to a demonstrated truth." But though it is an essential point in Clarke's view that what is right is to be done as such, apart from any consideration of pleasure or pain, it is to be inferred that he is not prepared to apply this doctrine in its unqualified form to such a creature as man, who is partly under the influence of irrational impulses. At least when he comes to argue the need of future rewards and punishments we find that his claim on behalf of morality is startlingly reduced. He now only contends that "virtue deserves to be chosen for its own sake, and vice to be avoided, though a man was sure for his own particular neither to gain nor lose anything by the practice of either." He fully admits that the question is altered when vice is attended by pleasure and profit to the vicious man, virtue by loss and calamity; and even that it is "not truly reasonable that men by adhering to virtue should part with their lives, if thereby they deprived themselves of all possibility of receiving any advantage from their adherence." 830

Thus, on the whole, the impressive earnestness with which Clarke enforces the doctrine of rational morality only rendered more manifest the difficulty of establishing ethics on an independent philosophical basis; so long at least as the psychological egoism of Hobbes is not definitely assailed and overthrown. Until this is done, the utmost demonstration of the abstract reasonableness of social duty only leaves us with an irreconcilable antagonism between the view of abstract reason and the self-love which is allowed to be the root of man's appetitive nature. Let us grant that there is as much intellectual absurdity in acting unjustly as in denying that two and two make four; still, if a man has to choose between absurdity and unhappiness, he will naturally prefer the former; and Clarke, as we have already seen, is not really prepared to maintain that such preference is irrational.[30]

Shaftesbury.

It remains to try another psychological basis for ethical construction; instead of presenting the principle of social duty as abstract reason, liable to conflict to any extent with natural self-love, we may try to exhibit the naturalness of man's social affections, and demonstrate a normal harmony between these and his self-regarding impulses. This is the line of thought which Shaftesbury (1671-1713) may be said to have initiated. This theory had already been advanced by Cumberland and others, but Shaftesbury was the first to make it the cardinal point in his system; no one had yet definitely transferred the centre of ethical interest from the Reason, conceived as apprehending either abstract moral distinctions or laws of divine legislation, for the emotional impulses that prompt to social duty; no one had undertaken to distinguish clearly, by analysis of experience, the disinterested and self-regarding elements of our appetitive nature, or to prove inductively their perfect harmony. In his *Inquiry concerning Virtue and Merit* he begins by attacking the egoism of Hobbes, which, as we have seen, was not necessarily excluded by the doctrine of rational intuitions of duty. This interpretation, he says, would be true only if we considered man as a wholly unrelated individual. Such a being we might doubtless call "good," if his impulses were adapted to the attainment of his own felicity. But man we must and do consider in relation to a larger system of which he forms a part, and so we call him "good" only when his impulses and dispositions are so balanced as to tend towards the good of this whole. And again we do not attribute goodness to him merely because his outward acts have beneficial results. When we speak of a man as good, we mean that his dispositions or affections are such as tend of themselves to promote the good or happiness of human society. Hobbes's moral man, who, if let loose from governmental constraint, would straightway spread ruin among his fellows, is not what we commonly agree to call good. Moral goodness, then, in a "sensible creature" implies primarily disinterested affections, whose direct object is the good of others; but Shaftesbury does not mean (as he has been misunderstood to mean) that only such benevolent social impulses are good, and that these are always good. On the contrary, he is careful to point out, first, that immoderate social affections defeat themselves, miss their proper end, and are therefore bad; secondly, that as an individual's good is part of the good of the whole, "self-affections" existing in a duly limited degree are morally good. Goodness, in short, consists in due combination, in just proportion, of both sorts of "affections," tendency to promote general good being taken as the criterion of the right degrees and proportions. This being established, the main aim of Shaftesbury's argument is to prove that the same balance of private and social affections, which tends naturally to public good, is also conducive to the happiness of the individual in whom it exists. Taking the different impulses in detail, he first shows how the individual's happiness is promoted by developing his social affections, mental pleasures being superior to bodily, and the pleasures of benevolence the richest of all. In discussing this he distinguishes, with well-applied subtlety, between the pleasurableness of the benevolent emotions themselves, the sympathetic enjoyment of the happiness of others, and the pleasure arising from a consciousness of their love and esteem. He then exhibits the unhappiness that results from any excess of the self-regarding impulses, bodily appetite, desire of wealth, emulation, resentment, even love of life itself; and ends by dwelling on the intrinsic painfulness of all malevolence.[31]

One more special impulse remains to be noticed. We have seen that goodness of character consists in a certain harmony of self-regarding and social affections. But virtue, in Shaftesbury's view, is something more; it implies a recognition of moral goodness and immediate preference of it for its own sake. This immediate pleasure that we take in goodness (and displeasure in its opposite) is due to a susceptibility which he calls the "reflex" or "moral" sense, and compares with our susceptibility to beauty and deformity in external things; it furnishes both an additional direct impulse to good conduct, and an additional gratification to be taken into account in the reckoning which proves the coincidence of virtue and happiness. This doctrine of the moral sense is sometimes represented as Shaftesbury's cardinal tenet; but though characteristic and important, it is not really necessary to his

main argument; it is the crown rather than the keystone of his ethical structure.

The appearance of Shaftesbury's *Characteristics* (1713) marks a turning-point in the history of English ethical thought. With the generation of moralists that followed, the consideration of abstract rational principles falls into the background, and its place is taken by introspective study of the human mind, observation of the actual play of its various impulses and sentiments. This empirical psychology had not indeed been neglected by previous writers. More, among others, had imitated Descartes in a discussion of the passions, and Locke's essay had given a still stronger impulse in the same direction; still, Shaftesbury is the first moralist who distinctly takes psychological experience as the basis of ethics. His suggestions were developed by Hutcheson into one of the most elaborate systems of moral philosophy which we possess; through Hutcheson, if not directly, they influenced Hume's speculations, and are thus connected with later utilitarianism. Moreover, the substance of Shaftesbury's main argument was adopted by Butler, though it could not pass the scrutiny of that powerful and cautious intellect without receiving important modifications and additions. On the other hand, the ethical optimism of Shaftesbury, rather broadly impressive than exactly reasoned, and connected as it was with a natural theology that implied the Christian scheme to be superfluous, challenged attack equally from orthodox divines and from cynical freethinkers. Of these latter Mandeville, the author of *The Fable of the Bees, or Private Vices Public Benefits* (1723), was a conspicuous if not a typical specimen. He can hardly be called a "moralist"; and though it is impossible to deny him a considerable share of philosophic penetration, his anti-moral paradoxes have not even apparent coherence. He is convinced that virtue (where it is more than a mere pretence) is purely artificial; but not quite certain whether it is a useless trammel of appetites and passions that are advantageous to society, or a device creditable to the politicians who introduced it by playing upon the "pride and vanity" of the "silly creature man." The view, however, to which he gave audacious expression, that moral regulation is something alien to the natural man, and imposed on him from without, seems to have been very current in the polite society of his time, as we learn both from Berkeley's *Alciphron* and from Butler's more famous sermons.

Mandeville.

The view of "human nature" against which Butler preached was not exactly Mandeville's, nor was it properly to be called Hobbist, although Butler fairly treats it as having a philosophical basis in Hobbes's psychology. It was, so to say, Hobbism turned inside out,—rendered licentious and anarchical instead of constructive. Hobbes had said "the natural state of man is non-moral, unregulated; moral rules are means to the end of peace, which is a means to the end of self-preservation." On this view morality, though dependent for its actuality on the social compact which establishes government, is actually binding on man as a reasonable being. But the quasi-theistic assumption that what is natural must be reasonable remained in the minds of Hobbes's most docile readers, and in combination with his thesis that egoism is natural, tended to produce results which were dangerous to social well-being. To meet this view Butler does not content himself, as is sometimes carelessly supposed, with insisting on the natural claim to authority of the conscience which his opponent repudiated as artificial; he adds a subtle and effective argument *ad hominem*. He first follows Shaftesbury in exhibiting the social affections as no less natural than the appetites and desires which tend directly to self-preservation; then reviving the Stoic view of the *prima naturae*, the first objects of natural appetites, he argues that pleasure is not the primary aim even of the impulses which Shaftesbury allowed to be "self-affections"; but rather a result which follows upon their attaining their natural ends. We have, in fact, to distinguish self-love, the "general desire that every man hath of his own happiness" or pleasure, from the particular affections, passions, and appetites directed towards objects other than pleasure, in the satisfaction of which pleasure consists. The latter are "necessarily presupposed" as distinct impulses in "the very idea of an interested pursuit"; since, if there were no such pre-existing desires, there would be no pleasure for self-love to aim at. Thus the object of hunger is not the pleasure of eating but food; hunger is therefore, strictly speaking, no more "interested" than benevolence; granting that the pleasures of the table are an important element in the happiness at which self-love aims, the same at least may be said for the pleasures of love and sympathy. Further, so far from bodily appetites (or other particular desires) being forms of self-love, there is no one of them which under certain circumstances may not come into conflict with it. Indeed, it is common for men to sacrifice to passion what they know to be their true interests; at the same time we do not consider such conduct "natural" in man as a rational being; we rather regard it as natural for him to govern his transient impulses. Thus the notion of natural unregulated egoism turns out to be a psychological chimera. Indeed, we may say that an egoist must be doubly self-regulative, since rational self-love ought to restrain not only other impulses, but itself also; for as happiness is made up of feelings that result from the satisfaction of impulses other than self-love, any over-development of the latter, enfeebling these other impulses, must proportionally diminish the happiness at which self-love aims. If, then, it be admitted that human impulses are naturally under government, the natural claim of conscience or the moral faculty to be the supreme governor will hardly be denied.

Butler.

But has not self-love also, by Butler's own account, a similar authority, which may come into conflict with that of conscience? Butler fully admits this, and, in fact, grounds on it an important criticism of Shaftesbury. We have seen that in the latter's system the "moral sense" is not absolutely required, or at least is necessary only as a substitute for enlightened self-regard; since if the harmony between prudence and virtue, self-regarding and social impulses, is complete, mere self-interest will prompt a duly enlightened mind to maintain precisely that "balance" of affections in which goodness consists. But to Butler's more cautious mind the completeness of this harmony did not seem

sufficiently demonstrable to be taken as a basis of moral teaching; he has at least to contemplate the possibility of a man being convinced of the opposite; and he argues that unless we regard conscience as essentially authoritative—which is not implied in the term "moral sense"—such a man is really bound to be vicious; "since interest, one's own happiness, is a manifest obligation." Still on this view, even if the authority of conscience be asserted, we seem reduced to an ultimate dualism of our rational nature. Butler's ordered polity of impulses turns out to be a polity with two independent governments. Butler does not deny this, so far as mere claim to authority is concerned;[32] but he maintains that, the dictates of conscience being clear and certain, while the calculations of self-interest lead to merely probable conclusions, it can never be practically reasonable to disobey the former, even apart from any proof which religion may furnish of the absolute coincidence of the two in a future life.

This dualism of governing principles, conscience and self-love, in Butler's system, and perhaps, too, his revival of the Platonic conception of human nature as an ordered and governed community of impulses, is perhaps most nearly anticipated in Wollaston's *Religion of Nature Delineated* (1722). Here, for the first time, we find "moral good" and "natural good" or "happiness" treated separately as two essentially distinct objects of rational pursuit and investigation; the harmony between them being regarded as matter of religious faith, not moral knowledge. Wollaston's theory of moral evil as consisting in the practical contradiction of a true proposition, closely resembles the most paradoxical part of Clarke's doctrine, and was not likely to approve itself to the strong common sense of Butler; but his statement of happiness or pleasure as a "justly desirable" end at which every rational being "ought" to aim corresponds exactly to Butler's conception of self-love as a naturally governing impulse; while the "moral arithmetic" with which he compares pleasures and pains, and endeavours to make the notion of happiness quantitatively precise, is an anticipation of Benthamism.

Wollaston.

There is another side of Shaftesbury's harmony which Butler was ultimately led to oppose in a more decided manner,—the opposition, namely, between conscience or the moral sense and the social affections. In the *Sermons*, indeed (1729), Butler seems to treat conscience and calm benevolence as permanently allied though distinct principles, but in the *Dissertation on Virtue*, appended to the *Analogy* (1739), he maintains that the conduct dictated by conscience will often differ widely from that to which mere regard for the production of happiness would prompt. We may take this latter treatise as representing the first in the development of English ethics, at which what were afterwards called "utilitarian" and "intuitional" morality were first formally opposed; in earlier systems the antithesis is quite latent, as we have incidentally noticed in the case of Cumberland and Clarke. The argument in Butler's dissertation was probably directed chiefly against Hutcheson, who in his *Inquiry into the Original of our Ideas of Beauty and Virtue* had definitely identified virtue with benevolence. The identification is slightly qualified in Hutcheson's posthumously published *System of Moral Philosophy* (1755), in which the general view of Shaftesbury is more fully developed, with several new psychological distinctions, including Butler's separation of "calm" benevolence—as well as, after Butler, "calm self-love"—from the "turbulent" passions, selfish or social. Hutcheson follows Butler again in laying stress on the regulating and controlling function of the moral sense; but he still regards "kind affections" as the principal objects of moral approbation—the "calm" and "extensive" affections being preferred to the turbulent and narrow—together with the desire and love of moral excellence which is ranked with universal benevolence, the two being equally worthy and necessarily harmonious. Only in a secondary sense is approval due to certain "abilities and dispositions immediately connected with virtuous affections," as candour, veracity, fortitude, sense of honour; while in a lower grade still are placed sciences and arts, along with even bodily skills and gifts; indeed, the approbation we give to these is not strictly moral, but is referred to the "sense of decency or dignity," which (as well as the sense of honour) is to be distinguished from the moral sense. Calm self-love Hutcheson regards as morally indifferent; though he enters into a careful analysis of the elements of happiness,[33] in order to show that a true regard for private interest always coincides with the moral sense and with benevolence. While thus maintaining Shaftesbury's "harmony" between public and private good, Hutcheson is still more careful to establish the strict disinterestedness of benevolent affections. Shaftesbury had conclusively shown that these were not in the vulgar sense selfish; but the very stress which he lays on the pleasure inseparable from their exercise suggests a subtle egoistic theory which he does not expressly exclude, since it may be said that this "intrinsic reward" constitutes the real motive of the benevolent man. To this Hutcheson replies that no doubt the exquisite delight of the emotion of love is a motive to sustain and develop it; but this pleasure cannot be directly obtained, any more than other pleasures, by merely desiring it; it can be sought only by the indirect method of cultivating and indulging the disinterested desire for others' good, which is thus obviously distinct from the desire for the pleasure of benevolence. He points to the fact that the imminence of death often intensifies instead of diminishing a man's desire for the welfare of those he loves, as a crucial experiment proving the disinterestedness of love; adding, as confirmatory evidence, that the sympathy and admiration commonly felt for self-sacrifice depends on the belief that it is something different from refined self-seeking.

Hutcheson.

It remains to consider how, from the doctrine that affection is the proper object of approbation, we are to deduce moral rules or "natural laws" prescribing or prohibiting outward acts. It is obvious that all actions conducive to the general good will deserve our highest approbation if done from disinterested benevolence; but how if they are not so done? In answering this question, Hutcheson

avails himself of the scholastic distinction between “material” and “formal” goodness. “An action,” he says, “is *materially* good when in fact it tends to the interest of the system, so far as we can judge of its tendency, or to the good of some part consistent with that of the system, whatever were the affections of the agent. An action is *formally* good when it flowed from good affection in a just proportion.” On the pivot of this distinction Hutcheson turns round from the point of view of Shaftesbury to that of later utilitarianism. As regards “material” goodness of actions, he adopts explicitly and unreservedly the formula afterwards taken as fundamental by Bentham; holding that “that action is best which procures the greatest happiness for the greatest numbers, and the worst which in a like manner occasions misery.” Accordingly his treatment of external rights and duties, though decidedly inferior in methodical clearness and precision, does not differ in principle from that of Paley or Bentham, except that he lays greater stress on the immediate conduciveness of actions to the happiness of individuals, and more often refers in a merely supplementary or restrictive way to their tendencies in respect of general happiness. It may be noticed, too, that he still accepts the “social compact” as the natural mode of constituting government, and regards the obligations of subjects to civil obedience as normally dependent on a tacit contract; though he is careful to state that consent is not absolutely necessary to the just establishment of beneficent government, nor the source of irrevocable obligation to a pernicious one.

An important step further in political utilitarianism was taken by Hume in his *Treatise on Human Nature* (1739). Hume concedes that a compact is the natural means of peacefully instituting a new government, and may therefore be properly regarded as the ground of allegiance to it at the outset; but he urges that, when once it is firmly established the duty of obeying it rests on precisely the same combination of private and general interests as the duty of keeping promises; it is therefore absurd to base the former on the latter. Justice, veracity, fidelity to compacts and to governments, are all co-ordinate; they are all “artificial” virtues, due to civilization, and not belonging to man in his “ruder and more natural” condition; our approbation of all alike is founded on our perception of their useful consequences. It is this last position that constitutes the fundamental difference between Hutcheson’s ethical doctrine and Hume’s.[34] The former, while accepting utility as the criterion of “material goodness,” had adhered to Shaftesbury’s view that dispositions, not results of action, were the proper object of moral approval; at the same time, while giving to benevolence the first place in his account of personal merit, he had shrunk from the paradox of treating it as the sole virtue, and had added a rather undefined and unexplained train of qualities,—veracity, fortitude, activity, industry, sagacity,—immediately approved in various degrees by the “moral sense” or the “sense of dignity.” This naturally suggested to a mind like Hume’s, anxious to apply the experimental method to psychology, the problem of reducing these different elements of personal merit—or rather our approval of them—to some common principle. The old theory that referred this approval entirely to self-love, is, he holds, easy to disprove by “crucial experiments” on the play of our moral sentiments; rejecting this, he finds the required explanation in the sympathetic pleasure that attends our perception of the conduciveness of virtue to the interests of human beings other than ourselves. He endeavours to establish this inductively by a survey of the qualities, commonly praised as virtues, which he finds to be always either useful or immediately agreeable, either (1) to the virtuous agent himself or (2) to others. In class (2) he includes, besides the Benevolence of Shaftesbury and Hutcheson, the useful virtues, Justice, Veracity and Fidelity to compacts; as well as such immediately agreeable qualities as politeness, wit, modesty and even cleanliness. The most original part of his discussion, however, is concerned with qualities immediately useful to their possessor. The most cynical man of the world, he says, with whatever “sullen incredulity” he may repudiate virtue as a hollow pretence, cannot really refuse his approbation to “discretion, caution, enterprise, industry, frugality, economy, good sense, prudence, discernment”; nor again, to “temperance, sobriety, patience, perseverance, considerateness, secrecy, order, insinuation, address, presence of mind, quickness of conception, facility of expression.” It is evident that the merit of these qualities in our eyes is chiefly due to our perception of their tendency to serve the person possessed of them; so that the cynic in praising them is really exhibiting the unselfish sympathy of which he doubts the existence. Hume admits the difficulty that arises, especially in the case of the “artificial” virtues, such as justice, &c., from the undeniable fact that we praise them and blame their opposites without consciously reflecting on useful or pernicious consequences; but considers that this may be explained as an effect of “education and acquired habits.”[35]

Hume.

So far the moral faculty has been considered as contemplative rather than active; and this, indeed, is the point of view from which Hume mainly regards it. If we ask what actual motive we have for virtuous conduct, Hume’s answer is not quite clear. On the one hand, he speaks of moral approbation as derived from “humanity and benevolence,” while expressly recognizing, after Butler, that there is a strictly disinterested element in our benevolent impulses (as also in hunger, thirst, love of fame and other passions). On the other hand, he does not seem to think that moral sentiment or “taste” can “become a motive to action,” except as it “gives pleasure or pain, and thereby constitutes happiness or misery.” It is difficult to make these views quite consistent; but at any rate Hume emphatically maintains that “*reason* is no motive to action,” except so far as it “directs the impulse received from appetite or inclination”; and recognizes—in his later treatise at least—no “obligation” to virtue, except that of the agent’s interest or happiness. He attempts, however, to show, in a summary way, that all the duties which his moral theory recommends are also “the true interest of the individual,”—taking into account the importance to his happiness of “peaceful reflection on one’s own conduct.”

But even if we consider the moral consciousness merely as a particular kind of pleasurable emotion, there is an obvious question suggested by Hume's theory, to which he gives no adequate answer. If the essence of "moral taste" is sympathy with the pleasure of others, why is not this specific feeling excited by other things beside virtue that tend to cause such pleasure? On this point Hume contents himself with the vague remark that "there are a numerous set of passions and sentiments, of which thinking rational beings are by the original constitution of nature the only proper objects." The truth is, that Hume's notion of moral approbation was very loose, as is sufficiently shown by the list of "useful and agreeable" qualities which he considers worthy of approbation.[36] It is therefore hardly surprising that his theory should leave the specific quality of the moral sentiments a fact still needing to be explained. An original and ingenious solution of this problem was offered by his contemporary Adam Smith, in his *Theory of Moral Sentiments* (1759). Without denying the actuality or importance of that sympathetic pleasure in the perceived or inferred effects of virtues and vices he yet holds that the essential part of common moral sentiment is constituted rather by a more direct sympathy with the impulses that prompt to action or expression. The spontaneous play of this sympathy he treats as an original and inexplicable fact of human nature, but he considers that its action is powerfully sustained by the pleasure that each man finds in the accord of his feelings with another's. By means of this primary element, compounded in various ways, Adam Smith explains all the phenomena of the moral consciousness. He takes first the semi-moral notion of "propriety" or "decorum," and endeavours to show inductively that our application of this notion to the social behaviour of another is determined by our degree of sympathy with the feeling expressed in such behaviour. Thus the prescriptions of good taste in the expression of feeling may be summed up in the principle, "reduce or raise the expression to that with which spectators will sympathize." When the effort to restrain feeling is exhibited in a degree which surprises as well as pleases, it excites admiration as a virtue or excellence; such excellences Adam Smith quaintly calls the "awful and respectable," contrasting them with the "amiable virtues" which consist in the opposite effort to sympathize, when exhibited in a remarkable degree. From the sentiments of propriety and admiration we proceed to the sense of merit and demerit. Here a more complex phenomenon presents itself for analysis; we have to distinguish in the sense of merit—(1) a direct sympathy with the sentiments of the agent, and (2) an indirect sympathy with the gratitude of those who receive the benefit of his actions. In the case of demerit there is a direct antipathy to the feelings of the misdoer, but the chief sentiment excited is sympathy with those injured by the misdeed. The object of this sympathetic resentment, impelling us to punish, is what we call injustice; and thus the remarkable stringency of the obligation to act justly is explained since the recognition of any action as unjust involves the admission that it may be forcibly obstructed or punished. Moral judgments, then, are expressions of the complex normal sympathy of an impartial spectator with the active impulses that prompt to and result from actions. In the case of our own conduct what we call conscience is really sympathy with the feelings of an imaginary impartial spectator.

Adam Smith.

Adam Smith gives authority to his moral system by saying that "moral principles are justly to be regarded as the laws of the Deity"; but this he never proves. So Hume insists emphatically on the "reality of moral obligation"; but is found to mean no more by this than the real existence of the likes and dislikes that human beings feel for each other's qualities. The fact is that amid the analysis of feelings aroused by the sentimentalism of Shaftesbury's school, the fundamental questions "What is right?" and "Why?" had been allowed to drop into the background, and the consequent danger to morality was manifest. The binding force of moral rules becomes evanescent if we admit, with Hutcheson, that the "sense" of them may properly vary from man to man as the palate does; and it seems only another way of putting Hume's doctrine, that reason is not concerned with the ends of action, to say that the mere existence of a moral sentiment is in itself no reason for obeying it. A reaction, in one form or another, against the tendency to dissolve ethics into psychology was inevitable; since mankind generally could not be so far absorbed by the interest of psychological hypothesis as to forget their need of establishing practical principles. It was obvious, too, that this reaction might take place in either of the two lines of thought, which, having been peacefully allied in Clarke and Cumberland, had become distinctly opposed to each other in Butler and Hutcheson. It might either fall back on the moral principles commonly accepted, and, affirming their objective validity, endeavour to exhibit them as a coherent and complete set of ultimate ethical truths; or it might take the utility or conduciveness to pleasure, to which Hume had referred for the origin of most sentiments, as an ultimate end and standard by which these sentiments might be judged and corrected. The former is the line adopted with substantial agreement by Price, Reid, Stewart and other members of the still existing Intuitional school; the latter method, with considerably more divergence of view and treatment, was employed independently and almost simultaneously by Paley and Bentham in both ethics and politics, and is at the present time widely maintained under the name of Utilitarianism.

Price's *Review of the Chief Questions and Difficulties of Morals* was published in 1757, two years before Adam Smith's treatise. In regarding moral ideas as derived from the "intuition of truth or immediate discernment of the nature of things by the understanding," Price revives the general view of Cudworth and Clarke; but with several specific differences. Firstly, his conception of "right" and "wrong" as "single ideas" incapable of definition or analysis—the notions "right," "fit," "ought," "duty," "obligation," being coincident or identical—at least avoids the confusions into which Clarke and Wollaston had been led by pressing the analogy between ethical and physical truth. Secondly, the emotional element of the moral consciousness, on which attention had been concentrated by Shaftesbury and his followers, though

Price.

distinctly recognized as accompanying the intellectual intuition, is carefully subordinated to it. While right and wrong, in Price's view, are "real objective qualities" of actions, moral "beauty and deformity" are subjective ideas; representing feelings which are partly the necessary effects of the perceptions of right and wrong in rational beings as such, partly due to an "implanted sense" or varying emotional susceptibility. Thus, both reason and sense of instinct co-operate in the impulse to virtuous conduct, though the rational element is primary and paramount. Price further follows Butler in distinguishing the perception of merit and demerit in agents as another accompaniment of the perception of right and wrong in actions; the former being, however, only a peculiar species of the latter, since, to perceive merit in any one is to perceive that it is right to reward him. It is to be observed that both Price and Reid are careful to state that the merit of the agent depends entirely on the intention or "formal rightness" of his act; a man is not blameworthy for unintended evil, though he may of course be blamed for any wilful neglect (cf. Arist., *Eth. Nic.*, iii. 1), which has caused him to be ignorant of his real duty. When we turn to the subject matter of virtue, we find that Price, in comparison with More or Clarke is decidedly laxer in accepting and stating his ethical first principles; 834
chiefly owing to the new antithesis to the view of Shaftesbury and Hutcheson by which his controversial position is complicated. What Price is specially concerned to show is the existence of ultimate principles *beside* the principle of universal benevolence. Not that he repudiates the obligation either of rational benevolence or self-love; on the contrary, he takes more pains than Butler to demonstrate the reasonableness of either principle. "There is not anything," he says, "of which we have more undeniably an intuitive perception, than that it is 'right to pursue and promote happiness,' whether for ourselves or for others." Finally, Price, writing after the demonstration by Shaftesbury and Butler of the actuality of disinterested impulses in human nature, is bolder and clearer than Cudworth or Clarke in insisting that right actions are to be chosen because they are right by virtuous agents as such, even going so far as to lay down that an act loses its moral worth in proportion as it is done from natural inclination.

Reid.

On this latter point Reid, in his *Essays on the Active Powers of the Human Mind* (1788), states a conclusion more in harmony with common sense, only maintaining that "no act can be morally good in which regard for what is right has not *some* influence." This is partly due to the fact that Reid builds more distinctly than Price on the foundation laid by Butler; especially in his acceptance of that duality of governing principles which we have noticed as a cardinal point in the latter's doctrine. Reid considers "regard for one's good on the whole" (Butler's self-love) and "sense of duty" (Butler's conscience) as two essentially distinct and co-ordinate rational principles, though naturally often comprehended under the one term, Reason. The rationality of the former principle he takes pains to explain and establish; in opposition to Hume's doctrine that it is no part of the function of reason to determine the ends which we ought to pursue, or the preference due to one end over another. He urges that the notion of "good[37] on the whole" is one which only a reasoning being can form, involving as it does abstraction from the objects of all particular desires, and comparison of past and future with present feelings; and maintains that it is a contradiction to suppose a rational being to have the notion of its Good on the Whole without a desire for it, and that such a desire must naturally regulate all particular appetites and passions. It cannot reasonably be subordinated even to the moral faculty; in fact, a man who doubts the coincidence of the two—which on religious grounds we must believe to be complete in a morally governed world—is reduced to the "miserable dilemma whether it is better to be a fool or a knave." As regards the moral faculty itself, Reid's statement coincides in the main with Price's; it is both intellectual and active, not merely perceiving the "rightness" or "moral obligation" of actions (which Reid conceives as a simple unanalysable relation between act and agent), but also impelling the will to the performance of what is seen to be right. Both thinkers hold that this perception of right and wrong in actions is accompanied by a perception of merit and demerit in agents, and also by a specific emotion; but whereas Price conceives this emotion chiefly as pleasure or pain, analogous to that produced in the mind by physical beauty or deformity, Reid regards it chiefly as benevolent affection, esteem and sympathy (or their opposites), for the virtuous (or vicious) agent. This "pleasurable good-will," when the moral judgment relates to a man's own actions, becomes "the testimony of a good conscience—the purest and most valuable of all human enjoyments." Reid is careful to observe that this moral faculty is not "innate" except in germ; it stands in need of "education, training, exercise (for which society is indispensable), and habit," in order to the attainment of moral truth. He does not with Price object to its being called the "moral sense," provided we understand by this a source not merely of feelings or notions, but of "ultimate truths." Here he omits to notice the important question whether the premises of moral reasoning are universal or individual judgments; as to which the use of the term "sense" seems rather to suggest the second alternative. Indeed, he seems himself quite undecided on this question; since, though he generally represents ethical method as deductive, he also speaks of the "original judgment that this action is right and that wrong."

The truth is that the construction of a scientific method of ethics is a matter of little practical moment to Reid. Thus, though he offers a list of first principles, by deduction from which these common opinions may be confirmed, he does not present it with any claim to completeness. Besides maxims relating to virtue in general,—such as (1) that there is a right and wrong in conduct, but (2) only in voluntary conduct, and that we ought (3) to take pains to learn our duty, and (4) fortify ourselves against temptations to deviate from it—Reid states five fundamental axioms. The first of these is merely the principle of rational self-love, "that we ought to prefer a greater to a lesser good, though more distinct, and a less evil to a greater,"—the mention of which seems rather inconsistent with Reid's distinct separation of the "moral faculty" from "self-love." The third is merely the general

rule of benevolence stated in the somewhat vague Stoical formula, that “no one is born for himself only.” The fourth, again, is the merely formal principle that “right and wrong must be the same to all in all circumstances,” which belongs equally to all systems of objective morality; while the fifth prescribes the religious duty of “veneration or submission to God.” Thus, the only principle which ever appears to offer definite guidance as to social duty is the second, “that so far as the intention of nature appears in the constitution of man, we ought to act according to that intention,” the vagueness[38] of which is obvious. (For Reid’s views on moral freedom see A. Bain, *Mental Science*, pp. 422, seq.)

Dugald Stewart.

A similar incompleteness in the statement of moral principles is found if we turn to Reid’s disciple, Dugald Stewart, whose *Philosophy of the Active and Moral Powers of Man* (1828) contains the general view of Butler and Reid, and to some extent that of Price,—expounded with more fulness and precision, but without important original additions or modifications. Stewart lays stress on the obligation of justice as distinct from benevolence; but his definition of justice represents it as essentially impartiality,—a virtue which (as was just now said of Reid’s fourth principle) must equally find a place in the utilitarian or any other system that lays down universally applicable rules of morality. Afterwards, however, Stewart distinguishes “integrity or honesty” as a branch of justice concerned with the rights of other men, which form the subject of “natural jurisprudence.” In this department he lays down the moral axiom “that the labourer is entitled to the fruit of his own labour” as the principle on which complete rights of property are founded; maintaining that occupancy alone would only confer a transient right of possession during use. The only other principles which he discusses are veracity and fidelity to promises, gratitude being treated as a natural instinct prompting to a particular kind of just actions.

Whewell.

It will be seen that neither Reid nor Stewart offers more than a very meagre and tentative contribution to that ethical science by which, as they maintain, the received rules of morality may be rationally deduced from self-evident first principles. A more ambitious attempt in the same direction was made by Whewell in his *Elements of Morality* (1846). Whewell’s general moral view differs from that of his Scottish predecessors chiefly in a point where we may trace the influence of Kant—viz. in his rejection of self-love as an independent rational and governing principle, and his consequent refusal to admit happiness, apart from duty, as a reasonable end for the individual. The moral reason, thus left in sole supremacy, is represented as 835
enunciating five ultimate principles,—those of benevolence, justice, truth, purity and order. With a little straining these are made to correspond to five chief divisions of Jus,—personal security (benevolence being opposed to the ill-will that commonly causes personal injuries), property, contract, marriage and government; while the first, second and fourth, again, regulate respectively the three chief classes of human motives,—affections, mental desires and appetites. Thus the list, with the addition of two general principles, “earnestness” and “moral purpose,” has a certain air of systematic completeness. When, however, we look closer, we find that the principle of order, or obedience to government, is not seriously intended to imply the political absolutism which it seems to express, and which English common sense emphatically repudiates; while the formula of justice is given in the tautological or perfectly indefinite proposition “that every man ought to have his own.” Whewell, indeed, explains that this latter formula must be practically interpreted by positive law, though he inconsistently speaks as if it supplied a standard for judging laws to be right or wrong. The principle of purity, again, “that the lower parts of our nature ought to be subject to the higher,” merely particularizes that supremacy of reason over non-rational impulses which is involved in the very notion of reasoned morality. Thus, in short, if we ask for a clear and definite fundamental intuition, distinct from regard for happiness, we find really nothing in Whewell’s doctrine except the single rule of veracity (including fidelity to promises); and even of this the axiomatic character becomes evanescent on closer inspection, since it is not maintained that the rule is practically unqualified, but only that it is practically undesirable to formulate its qualifications.

Intuitional and utilitarian schools.

On the whole, it must be admitted that the doctrine of the intuitional school of the 18th and 19th centuries has been developed with less care and consistency than might have been expected, in its statement of the fundamental axioms or intuitively known premises of moral reasoning. And if the controversy which this school has conducted with utilitarianism had turned principally on the determination of the matter of duty, there can be little doubt that it would have been forced into more serious and systematic effort to define precisely and completely the principles and method on which we are to reason deductively to particular rules of conduct.[39] But in fact the difference between intuitionists and utilitarians as to the method of determining the particulars of the moral code was complicated with a more fundamental disagreement as to the very meaning of “moral obligation.” This Paley and Bentham (after Locke) interpreted as merely the effect on the will of the pleasures or pains attached to the observance or violation of moral rules, combining with this the doctrine of Hutcheson that “general good” or “happiness” is the final end and standard of these rules; while they eliminated all vagueness from the notion of general happiness by defining it to consist in “excess of pleasure over pain”—pleasures and pains being regarded as “differing in nothing but continuance or intensity.” The utilitarian system gained an attractive air of simplicity by thus using a single perfectly clear notion—pleasure and its negative quantity pain—to answer both the fundamental questions of mortals, “What is right?” and “Why should I do it?” But since there is no logical connexion between the answers that have thus come to be considered as one doctrine, this apparent unity and simplicity

has really hidden fundamental disagreements, and caused no little confusion in ethical debate.

Paley.

In Paley's *Principles of Moral and Political Philosophy*[40] (1785), the link between general pleasure (the standard) and private pleasure or pain (the motive) is supplied by the conception of divine legislation. To be "obliged" is to be "urged by a violent motive resulting from the command of another"; in the case of moral obligation, the command proceeds from God, and the motive lies in the expectation of being rewarded and punished after this life. The commands of God are to be ascertained "from scripture and the light of nature combined." Paley, however, holds that scripture is given less to teach morality than to illustrate it by example and enforce it by new sanctions and greater certainty, and that the light of nature makes it clear that God wills the happiness of his creatures. Hence, his method in deciding moral questions is chiefly that of estimating the tendency of actions to promote or diminish the general happiness. To meet the obvious objections to this method, based on the immediate happiness caused by admitted crimes (such as "knocking a rich villain on the head"), he lays stress on the necessity of general rules in any kind of legislation;[41] while, by urging the importance of forming and maintaining good habits, he partly evades the difficulty of calculating the consequences of particular actions. In this way the utilitarian method is freed from the subversive tendencies which Butler and others had discerned in it; as used by Paley, it merely explains the current moral and jural distinctions, exhibits the obvious basis of expediency which supports most of the received rules of law and morality and furnishes a simple solution, in harmony with common sense, of some perplexing casuistical questions. Thus (*e.g.*) "natural rights" become rights of which the general observance would be useful apart from the institution of civil government; as distinguished from the no less binding "adventitious rights," the utility of which depends upon this institution. Private property is in this sense "natural" from its obvious advantages in encouraging labour, skill, preservative care; though actual rights of property depend on the general utility of conforming to the law of the land by which they are determined. We observe, however, that Paley's method is often mixed with reasonings that belong to an alien and older manner of thought; as when he supports the claim of the poor to charity by referring to the intention of mankind "when they agreed to a separation of the common fund," or when he infers that monogamy is a part of the divine design from the equal numbers of males and females born. In other cases his statement of utilitarian considerations is fragmentary and unmethodical, and tends to degenerate into loose exhortation on rather trite topics.

Bentham and his school.

In unity, consistency and thoroughness of method, Bentham's utilitarianism has a decided superiority over Paley's. He considers actions solely in respect of their pleasurable and painful consequences, expected or actual; and he recognizes the need of making a systematic register of these consequences, free from the influences of common moral opinion, as expressed in the "eulogistic" and "dyslogistic" terms in ordinary use. Further, the effects that he estimates are all of a definite, palpable, empirically ascertainable quality; they are such pleasures and pains as most men feel and all can observe, so that all his political or moral inferences lie open at every point to the test of practical experience. Every one, it would seem, can tell what value he sets on the pleasures of alimentation, sex, the senses generally, wealth, power, curiosity, sympathy, antipathy (malevolence), the goodwill of individuals or of society at large, and on the corresponding pains, as well as the pains of labour and organic disorders;[42] and can guess the rate at which they are valued by others; therefore if it be once granted that all actions are determined by pleasures and pains, and are to be tried by the same standard, the art of legislation and private conduct is apparently placed on an empirical, basis. Bentham, no doubt, seems to go beyond the limits of experience proper in recognizing "religious" pains and pleasures in his fourfold division of sanctions, side by side with the "physical," "political," and "moral" or "social"; but the truth is that he does not seriously take account of them, except in so far as religious hopes and fears are motives actually operating, which therefore admit of being observed and measured as much as any other motives. He does not himself use the will of an omnipotent and benevolent being as a means of logically connecting individual and general happiness. He thus undoubtedly simplifies his system, and avoids the doubtful inferences from nature and Scripture in which Paley's position is involved; but this gain is dearly purchased. For in answer to the question that immediately arises, How then are the sanctions of the moral rules which it will most conduce to the general happiness for men to observe, shown to be always adequate in the case of all the individuals whose observance is required? he is obliged to admit that "the only interests which a man is at all times sure to find adequate motives for consulting are his own." Indeed, in many parts of his work, in the department of legislative and constitutional theory, it is rather assumed that the interests of some men will continually conflict with those of their fellows, unless we alter the balance of prudential calculation by a readjustment of penalties. But on this assumption a system of private conduct on utilitarian principles cannot be constructed until legislative and constitutional reform has been perfected. And, in fact, "private ethics," as conceived by Bentham, does not exactly expound such a system; but rather exhibits the coincidence, *so far as it extends*, between private and general happiness, in that part of each man's conduct that lies beyond the range of useful legislation. It was not his place, as a practical philanthropist, to dwell on the defects in this coincidence;[43] and since what men generally expect from a moralist is a completely reasoned account of what they ought to do, it is not surprising that some of Bentham's disciples should have either ignored or endeavoured to supply the gap in his system. One section of the school even maintained it to be a cardinal doctrine of utilitarianism that a man always gains his own greatest happiness by promoting that of others; another section, represented by John Austin, apparently returned to Paley's position, and treated utilitarian morality[44]

as a code of divine legislation; others, with Grote, are content to abate the severity of the claims made by "general happiness" on the individual, and to consider utilitarian duty as practically limited by reciprocity; while on the opposite side an unqualified subordination of private to general happiness was advocated by J.S. Mill, who did more than any other member of the school to spread and popularize utilitarianism in ethics and politics.

Varieties of utilitarian doctrine.

The fact is that there are several different ways in which a utilitarian system of morality may be used, without deciding whether the sanctions attached to it are always adequate. (1) It may be presented as practical guidance to all who choose "general good" as their ultimate end, whether they do so on religious grounds, or through the predominance in their minds of impartial sympathy, or because their conscience acts in harmony with utilitarian principles, or for any combination of these or any other reasons; or (2) it may be offered as a code to be obeyed not absolutely, but only so far as the coincidence of private and general interest may in any case be judged to extend; or again (3) it may be proposed as a standard by which men may reasonably agree to praise and blame the conduct of others, even though they may not always think fit to act on it. We may regard morality as a kind of supplementary legislation, supported by public opinion, which we may expect the public, when duly enlightened, to frame in accordance with the public interest. Still, even from this point of view, which is that of the legislator or social reformer rather than the moral philosopher, our code of duty must be greatly influenced by our estimate of the degrees in which men are normally influenced by self-regard (in its ordinary sense of regard for interests not sympathetic) and by sympathy or benevolence, and of the range within which sympathy may be expected to be generally effective. Thus, for example, the moral standard for which a utilitarian will reasonably endeavour to gain the support of public opinion must be essentially different in quality, according as he holds with Bentham that nothing but self-regard will "serve for diet," though "for a dessert benevolence is a very valuable addition"; or with J.S. Mill that disinterested public spirit should be the prominent motive in the performance of all socially useful work, and that even hygienic precepts should be inculcated, not chiefly on grounds of prudence, but because "by squandering our health we disable ourselves from rendering services to our fellow-creatures."

J.S. Mill.

Not less important is the interval that separates Bentham's polemical attitude towards the moral sense from Mill's conciliatory position, that "the mind is not in a state conformable to utility unless it loves virtue as a thing desirable in itself." Such love of virtue Mill holds to be in a sense natural, though not an ultimate and inexplicable fact of human nature; it is to be explained by the "Law of Association" of feelings and ideas, through which objects originally desired as a means to some further end come to be directly pleasant or desirable. Thus, the miser first sought money as a means to comfort, but ends by sacrificing comfort to money; and similarly though the first promptings to justice (or any other virtue) spring from the non-moral pleasures gained or pains avoided by it, through the link formed by repeated virtuous acts the performance of them ultimately comes to have that immediate satisfaction attached to it which we distinguished as moral. Indeed, the acquired tendency to virtuous conduct may become so strong that the habit of willing it may continue, "even when the reward which the virtuous man receives from the consciousness of well-doing is anything but an equivalent for the sufferings he undergoes or the wishes he may have to renounce." It is thus that the before-mentioned self-sacrifice of the moral hero is conceived by Mill to be possible and actual. The moral sentiments, on this view, are not phases of self-love as Hobbes held; nor can they be directly identified with sympathy, either in Hume's way or in Adam Smith's; in fact, though apparently simple they are really derived in a complex manner from self-love and sympathy combined with more primitive impulses. Justice (*e.g.*) is regarded by Mill as essentially resentment moralized by enlarged sympathy and intelligent self-interest; what we mean by injustice is harm done to an assignable individual by a breach of some rule for which we desire the violator to be punished, for the sake both of the person injured and of society at large, including ourselves. As regards moral sentiments generally, the view suggested by Mill is more definitely given by the chief living representative of the associationist school, Alexander Bain; by whom the distinctive characteristics of conscience are traced to "education under government or authority," though prudence, disinterested sympathy and other emotions combine to swell the mass of feeling vaguely denoted by the term moral. The combination of antecedents is somewhat differently given by different writers; but all agree in representing the conscience of any individual as naturally correlated to the interests of the community of which he is a member, and thus a natural ally in enforcing utilitarian rules, or even a valuable guide when utilitarian calculations are difficult and uncertain.

Association and evolution.

This substitution of hypothetical history for direct analysis of the moral sense is really older than the utilitarianism of Paley and Bentham, which it has so profoundly modified. The effects of association in modifying mental phenomena were noticed by Locke, and made a cardinal point in the metaphysic of Hume; who also referred to the principle slightly in his account of justice and other "artificial" virtues. Some years earlier, Gay,[45] admitting Hutcheson's proof of the actual disinterestedness of moral and benevolent impulses, had maintained that these (like the desires of knowledge or fame, the delight of reading, hunting and planting, &c.) were derived from self-love by "the power of association." But a thorough and systematic application of the principle to ethical psychology is first found in Hartley's *Observations on Man* (1748). Hartley, too, was the first to conceive association as producing, instead of mere cohesion of mental phenomena, a quasi-chemical combination of these into a compound apparently different from its elements. He shows elaborately how the pleasures and

pains of “imagination, ambition, self-interest, sympathy, theopathy, and the moral sense” are developed out of the elementary pleasures and pains of sensation; by the coalescence into really complex but apparently single ideas of the “miniatures” or faint feelings which the repetition of sensations contemporaneously or in immediate succession tends to produce in cohering groups. His theory assumes the correspondence of mind and body, and is applied *pari passu* to the formation of ideas from sensations, and of “compound vibratiuncules in the medullary substance” from the original vibrations that arise in the organ of sense.[46] The same general view was afterwards developed with much vigour and clearness on the psychical side alone by James Mill in his *Analysis of the Human Mind*. The whole theory has been persistently controverted by writers of the intuitional school, who (unlike Hartley) have usually thought that this derivation of moral sentiments from more primitive feelings would be detrimental to the authority of the former. The chief argument against this theory has been based on the early period at which these sentiments are manifested by children, which hardly allows time for association to produce the effects ascribed to it. This argument has been met in recent times by the application to mind of the physiological theory of heredity, according to which changes produced in the mind (brain) of a parent, by association of ideas or otherwise, tend to be inherited by his offspring; so that the development of the moral sense or any other faculty or susceptibility of existing man may be hypothetically carried back into the prehistoric life of the human race, without any change in the manner of derivation supposed. At present, however, the theory of heredity is usually held in conjunction with Darwin’s theory of natural selection; according to which different kinds of living things in the course of a series of generations come gradually to be endowed with organs, faculties and habits tending to the preservation of the individual or species under the conditions of life in which it is placed. Thus we have a new zoological factor in the history of the moral sentiments; which, though in no way opposed to the older psychological theory of their formation through coalescence of more primitive feelings, must yet be conceived as controlling and modifying the effects of the law of association by preventing the formation of sentiments other than those tending to the preservation of human life. The influence of the Darwinian theory, moreover, has extended from historical psychology to ethics, tending to substitute “preservation of the race under its conditions of existence” for “happiness” as the ultimate end and standard of virtue.

Free-will.

Before concluding this sketch of the development of English ethical thought from Hobbes to the thinkers of the 19th century, it will be well to notice briefly the views held by different moralists on the question of free-will,—so far, that is, as they have been put forward as ethically important. We must first distinguish three meanings in which “freedom” is attributed to the will or “inner self” of a human being, viz. (1) the general power of choosing among different alternatives of action without a motive, or against the resultant force of conflicting motives; (2) the power of choice between the promptings of reason and those of appetites (or other non-rational impulses) when the latter conflict with reason; (3) merely the quality of acting rationally in spite of conflicting impulses, however strong, the *non posse peccare* of the medieval theologians.[47] It is obvious that “freedom” in this third sense is in no way incompatible with complete determination; and, indeed, is rather an ideal state after which the moral agent ought to aspire than a property which the human will can be said to possess. In the first sense, again, as distinct from the second, the assertion of “freedom” has no ethical significance, except in so far as it introduces a general uncertainty into all our inferences respecting human conduct. Even in the second sense it hardly seems that the freedom of a man’s will can be an element to be considered in examining what it is right or best for him to do (though of course the clearest convictions of duty will be fruitless if a man has not sufficient self-control to enable him to act on them); it is rather when we ask whether it is just to punish him for wrong-doing that it seems important to know whether he could have done otherwise. But in spite of the strong interest taken in the theological aspect of this question by the Protestant divines of the 17th century, it does not appear that English moralists from Hobbes to Hume laid any stress on the relation of free-will either to duty generally or to justice in particular. Neither the doctrine of Hobbes, that deliberation is a mere alternation of competing desires, voluntary action immediately following the “last appetite,” nor the hardly less decided Determinism of Locke, who held that the will is always moved by the greatest present uneasiness, appeared to either author to require any reconciliation with the belief in human responsibility. Even in Clarke’s system, where Indeterminism is no doubt a cardinal notion, its importance is metaphysical rather than ethical; Clarke’s view being that the apparently arbitrary particularity in the constitution of the cosmos is really only explicable by reference to creative free-will. In the ethical discussion of Shaftesbury and sentimental moralists generally this question drops naturally out of sight; and the cautious Butler tries to exclude its perplexities as far as possible from the philosophy of practice. But since the reaction, led by Price and Reid, against the manner of philosophizing that had culminated in Hume, free-will has been generally maintained by the intuitional school to be an essential point of ethics; and, in fact, it is naturally connected with the judgment of good and ill desert which these writers give as an essential element in their analysis of the moral consciousness. An irresistible motive, it is forcibly said, palliates or takes away guilt; no one can blame himself for yielding to necessity, and no one can properly be punished for what he could not have prevented. In answer to this argument some necessarians have admitted that punishment can be legitimate only if it be beneficial to the person punished; others, again, have held that the lawful use of force is to restrain lawless force; but most of those who reject free-will defend punishment on the ground of its utility in deterring others from crime, as well as in correcting or restraining the criminal on whom it falls.

In the preceding sketch we have traced the course of English ethical speculation without bringing it

into relation with contemporary European thought on the same subject. And in fact almost all the systems described, from Hobbes downward, have been of essentially native growth, showing hardly any traces of foreign influence. We may observe that ethics is the only department in which this result appears. The physics and psychology of Descartes were much studied in England, and his metaphysical system was certainly the most important antecedent of Locke's; but Descartes hardly touched ethics proper. So again the controversy that Clarke conducted with Spinoza, and afterwards with Leibnitz, was entirely confined to the metaphysical region. Catholic France was a school for Englishmen in many subjects, but not in morality; the great struggle between Jansenists and Jesuits had a very remote interest for them. It was not till near the close of the 18th century that the impress of the French revolutionary philosophy began to manifest itself in England; and even then its influence was mostly political rather than ethical. It is striking to observe how even in the case of writers such as Godwin, who were most powerfully affected by the French political movement, the moral basis, on which the new social order of rational and equal freedom is constructed, is almost entirely of native origin; even when the tone and spirit are French, the forms of thought and manner of reasoning are still purely English. In the derivation of Benthamism alone—which, it may be observed, first becomes widely known in the French paraphrase of Dumont—an important element is supplied by the works of a French writer, Helvetius; as Bentham himself was fully conscious. It was from Helvetius that he learnt that, men being universally and solely governed by self-love, the so-called moral judgments are really the common judgments of any society as to its common interests; that it is therefore futile on the one hand to propose any standard of virtue, except that of conduciveness to general happiness, and on the other hand useless merely to lecture men on duty and scold them for vice; that the moralist's proper function is rather to exhibit the coincidence of virtue with private happiness; that, accordingly, though nature has bound men's interests together in many ways, and education by developing sympathy and the habit of mutual help may much extend the connexion, still the most effective moralist is the legislator, who by acting on self-love through legal sanctions may mould human conduct as he chooses. These few simple doctrines give the ground plan of Bentham's indefatigable and lifelong labours.

French influence on English ethics.

Helvetius.

So again, in the modified Benthamism which the persuasive exposition of J.S. Mill afterwards made popular in England, the influence of Auguste Comte (*Philosophie positive*, 1829-1842, and *Système de politique positive*, 1851-1854) appears as the chief modifying element. This influence, so far as it has affected moral as distinct from political speculation, has been exercised primarily through the general conception of human progress; which, in Comte's view, consists in the ever-growing preponderance of the distinctively human attributes over the purely animal, social feelings being ranked highest among human attributes, and highest of all the most universalized phase of human affection, the devotion to humanity as a whole. Accordingly, it is the development of benevolence in man, and of the habit of "living for others," which Comte takes as the ultimate aim and standard of practice, rather than the mere increase of happiness. He holds, indeed, that the two are inseparable, and that the more *altruistic* any man's sentiments and habits of action can be made, the greater will be the happiness enjoyed by himself as well as by others. But he does not seriously trouble himself to argue with egoism, or to weigh carefully the amount of happiness that might be generally attained by the satisfaction of egoistic propensities duly regulated; a supreme unquestioning self-devotion, in which all personal calculations are suppressed, is an essential feature of his moral ideal. Such a view is almost diametrically opposed to Bentham's conception of normal human existence; the newer utilitarianism of Mill represents an endeavour to find the right middle path between the two extremes.

Comte.

It is to be observed that, in Comte's view, devotion to humanity is the principle not merely of morality, but of religion; *i.e.* it should not merely be practically predominant, but should be manifested and sustained by regular and partly symbolical forms of expression, private and public. This side of Comte's system, however, and the details of his ideal reconstruction of society, in which this religion plays an important part, have had but little influence either in England or elsewhere. It is more important to notice the general effect of his philosophy on the method of determining the particulars of morality as well as of law (as it ought to be). In the utilitarianism of Paley and Bentham the proper rules of conduct, moral and legal, are determined by comparing the imaginary consequences of different modes of regulation on men and women, conceived as specimens of a substantially uniform and unchanging type. It is true that Bentham expressly recognizes the varying influences of climate, race, religion, government, as considerations which it is important for the legislator to take into account; but his own work of social construction was almost entirely independent of such considerations, and his school generally appear to have been convinced of their competence to solve all important ethical and political questions for human beings of all ages and countries, without regard to their specific differences. But in the Comtian conception of social science, of which ethics and politics are the practical application, the knowledge of the laws of the evolution of society is of fundamental and continually increasing importance; humanity is regarded as having passed through a series of stages, in each of which a somewhat different set of laws and institutions, customs and habits, is normal and appropriate. Thus present man is a being that can only be understood through a knowledge of his past history; and any effort to construct for him a moral and political ideal, by a purely abstract and unhistorical method, must necessarily be futile; whatever modifications may at any time be desirable in positive law and morality can only be determined by the aid of "social dynamics." This view extends far beyond the limits of Comte's special school or sect,

and has been widely accepted.

When we turn from French philosophy to German, we find the influence of the latter on English ethical thought almost insignificant until a very recent period. In the 17th century, indeed, the treatise of Pufendorf on the *Law of Nature*, in which the general view of Grotius was restated with modifications, partly designed to effect a compromise with the doctrine of Hobbes, seems to have been a good deal read at Oxford and elsewhere. Locke includes it among the books necessary to the complete education of a gentleman. But the subsequent development of the theory of conduct in Germany dropped almost entirely out of the cognizance of Englishmen; even the long dominant system of Wolff (d. 1754) was hardly known. Nor had Kant any serious influence in England until the second quarter of the 19th century. We find, however, distinct traces of Kantian influence in Whewell and other writers of the intuitional school, and at a later date it became so strong that its importance on subsequent ethical thought can scarcely be over-estimated.

German influence on English ethics.

The English moralist with whom Kant has most affinity is Price; in fact, Kantism, in the ethical thought of modern Europe, holds a place somewhat analogous to that formerly occupied by the teaching of Price and Reid among English moralists. Kant, like Price and Reid, holds that man as a rational being is unconditionally bound to conform to a certain rule of right, or "categorical imperative" of reason. Like Price he holds that an action is not good unless done from a good motive, and that this motive must be essentially different from natural inclination of any kind; duty, to be duty, must be done for duty's sake; and he argues, with more subtlety than Price or Reid, that though a virtuous act is no doubt pleasant to the virtuous agent, and any violation of duty painful, this moral pleasure (or pain) cannot strictly be the motive to the act, because it follows instead of preceding the recognition of our obligation to do it.[48] With Price, again, he holds that rightness of intention and motive is not only an indispensable condition or element of the rightness of an action, but actually the sole determinant of its moral worth; but with more philosophical consistency he draws the inference—of which the English moralist does not seem to have dreamt—that there can be no separate rational principles for determining the "material" rightness of conduct, as distinct from its "formal" rightness; and therefore that all rules of duty, so far as universally binding, must admit of being exhibited as applications of the one general principle that duty ought to be done for duty's sake. This deduction is the most original part of Kant's doctrine. The dictates of reason, he points out, must necessarily be addressed to all rational beings as such; hence, my intention cannot be right unless I am prepared to will the principle on which I act to be a universal law. He considers that this fundamental rule or imperative "act on a maxim which thou canst will to be law universal" supplies a sufficient criterion for determining particular duties in all cases. The rule excludes wrong conduct with two degrees of stringency. Some offences, such as making promises with the intention of breaking them, we cannot even conceive universalized; as soon as every one broke promises no one would care to have promises made to him. Other maxims, such as that of leaving persons in distress to shift for themselves, we can easily conceive to be universal laws, but we cannot without contradiction will them to be such; for when we are ourselves in distress we cannot help desiring that others should help us.

Kant.

Categorical Imperative.

Another important peculiarity of Kant's doctrine is his development of the connexion between duty and free-will. He holds that it is through our moral consciousness that we know that we are free; in the cognition that I ought to do what is right because it is right and not because I like it, it is implied that this purely rational volition is possible; that my action can be determined, not "mechanically," through the necessary operation of the natural stimuli of pleasurable and painful feelings, but in accordance with the laws of my true, reasonable self. The realization of reason, or of human wills so far as rational, thus presents itself as the absolute end of duty; and we get, as a new form of the fundamental practical rule, "act so as to treat humanity, in thyself or any other, as an end always, and never as a means only." We may observe, too, that the notion of freedom connects ethics with jurisprudence in a simple and striking manner. The fundamental aim of jurisprudence is to realize external freedom by removing the hindrances imposed on each one's free action through the interferences of other wills. Ethics shows how to realize internal freedom by resolutely pursuing rational ends in opposition to those of natural inclination. If we ask what precisely are the ends of reason, Kant's proposition that "all rational beings as such are ends in themselves for every rational being" hardly gives a clear answer. It might be interpreted to mean that the result to be practically sought is simply the development of the rationality of all rational beings—such as men—whom we find to be as yet imperfectly rational. But this is not Kant's view. He holds, indeed, that each man should aim at making himself the most perfect possible instrument of reason; but he expressly denies that the perfection of others can be similarly prescribed as an end to each. It is, he says, "a contradiction to regard myself as in duty bound to promote the perfection of another, ... a contradiction to make it a duty for me to do something for another which no other but himself can do." In what practical sense, then, am I to make other rational beings my ends? Kant's answer is that what each is to aim at in the case of others is not Perfection, but Happiness, *i.e.* to help them to attain those purely subjective ends that are determined for each not by reason, but by natural inclination. He explains also that to seek one's own happiness cannot be prescribed as a duty, because it is an end to which every man is inevitably impelled by natural inclination: but that just because each inevitably desires his own happiness, and therefore desires that others should assist him in time of need, he is bound to make the happiness of others his ethical end, since he cannot *morally* demand

aid from others, without accepting the obligation of aiding them in like case. The exclusion of private happiness from the ends at which it is a duty to aim contrasts strikingly with the view of Butler and Reid, that man, as a rational being, is under a "manifest obligation" to seek his own interest. The difference, however, is not really so great as it seems; since in another part of his system Kant fully recognizes the reasonableness of the individual's regard for his own happiness. Though duty, in his view, excludes regard for private happiness, the *summum bonum* is not duty alone, but happiness combined with moral worth; the demand for happiness as the reward of duty is so essentially reasonable that we must postulate a universal connexion between the two as the order of the universe; indeed, the practical necessity of this postulate is the only adequate rational ground that we have for believing in the existence of God.

Hegel.

Before the ethics of Kant had begun to be seriously studied in England, the rapid and remarkable development of metaphysical view and method of which the three chief stages are represented by Fichte, Schelling and Hegel respectively had already taken place; and the system of the latter was occupying the most prominent position in the philosophical thought of Germany.[49] Hegel's ethical doctrine (expounded chiefly in his *Philosophie des Rechts*, 1821) shows a close affinity, and also a striking contrast, to Kant's. He holds, with Kant, that duty or good conduct consists in the conscious realization of the free reasonable will, which is essentially the same in all rational beings. But in Kant's view the universal content of this will is only given in the formal condition of "only acting as one can desire all to act," to be subjectively applied by each rational agent to his own volition; whereas Hegel conceives the universal will as objectively presented to each man in the laws, institutions and customary morality of the community of which he is a member. Thus, in his view, not merely natural inclinations towards pleasures, or the desires for selfish happiness, require to be morally resisted; but even the prompting of the individual's conscience, the impulse to do what seems to him right, if it comes into conflict with the common sense of his community. It is true that Hegel regards the conscious effort to realize one's own conception of good as a higher stage of moral development than the mere conformity to the jural rules establishing property, maintaining contract and allotting punishment to crime, in which the universal will is first expressed; since in such conformity this will is only accomplished accidentally by the outward concurrence of individual wills, and is not essentially realized in any of them. He holds, however, that this conscientious effort is self-deceived and futile, is even the very root of moral evil, except it attains its realization in harmony with the objective social relations in which the individual finds himself placed. Of these relations the first grade is constituted by the family, the second by civil society, and the third by the state, the organization of which is the highest manifestation of universal reason in the sphere of practice.

Hegelianism appears as a distinct element in modern English ethical thought; but the direct influence of Hegel's system is perhaps less important than that indirectly exercised through the powerful stimulus which it has given to the study of the historical development of human thought and human society. According to Hegel, the essence of the universe is a process of thought from the abstract to the concrete; and a right understanding of this process gives the key for interpreting the evolution in time of European philosophy. So again, in his view, the history of mankind is a history of the necessary development of the free spirit through the different forms of political organization: the first being that of the Oriental monarchy, in which freedom belongs to the monarch only; the second, that of the Graeco-Roman republics, in which a select body of free citizens is sustained on a basis of slavery; while finally in the modern societies, sprung from the Teutonic invasion of the decaying Roman empire, freedom is recognized as the natural right of all members of the community. The effect of the lectures (posthumously edited) in which Hegel's "Philosophy of History" and "History of Philosophy" were expounded, has extended far beyond the limits of his special school; indeed, the predominance of the historical method in all departments of the theory of practice is not a little due to their influence.

(H. S.; X.)

D. *Ethics since 1879*.—Ethical controversies, like most other speculative disputes, have, during the latter part of the 19th and the beginning of the 20th century, centred round Darwinian theories. The chief characteristic of English moral philosophy in its previous history has been its comparative isolation from great movements, sometimes contemporary movements, of philosophical or scientific thought. Ethics in England no less than on the continent of Europe suffered until the time of Bacon from the excessive domination of theological dogma and the traditional scholastic and Aristotelian philosophy. But the moral philosophy of the 18th century, freed from scholastic trammels, was a genuine native product, arising out of the real problem of conduct and reaching its conclusions, at least ostensibly, by an analysis of, and an appeal to, the facts of conduct and the nature of morality. Even at the beginning of the 19th century, when the main interest of writers who belonged to the Utilitarian school was mainly political, the influence of political theories upon contemporary moral philosophy was upon the whole an influence of which the moral philosophers themselves were unconscious; and from the nature of things moral and political philosophy have a tendency to become one and the same inquiry. Mill, it is true, and Comte both encouraged the idea that society and conduct alike were susceptible of strictly scientific investigation. But the attempt not only to treat ethics scientifically, but actually to subordinate the principles of conduct to the principles of existing biological science or group of sciences biological in character, was reserved for post-Darwinian moral philosophers. That attempt has not, in the opinion of the majority of critics, been successful, and perhaps what is most permanent in the contribution of modern times to ethical theory will ultimately

be attributed to philosophers antagonistic to evolutionary ethics. Nevertheless the application of the historical method to inquiries concerning the facts of morality and the moral life—itself part of the great movement of thought to which Darwin gave the chief impetus—has caused moral problems to be presented in a novel aspect; while the influence of Darwinism upon studies which have considerable bearing upon ethics, *e.g.* anthropology or the study of comparative religion, has been incalculable.

The other great movement in modern moral philosophy due to the influence of German, and especially Hegelian, idealism followed naturally for the most part from the revival of interest in metaphysics noticeable in the latter half of the 19th century.

But metaphysical systems of ethics are no novelty even in England, and, while the increased interest in ultimate issues of philosophy has enormously deepened and widened men's appreciation of moral problems and the issues involved in conduct, the actual advance in ethical theory produced by such speculations has been comparatively slight. What is of lasting importance is the re-affirmation upon metaphysical grounds of the right of the moral consciousness to state and solve its own difficulties, and the successful repulsion of the claims of particular sciences such as biology to include the sphere of conduct within their scope and methods. And both evolutionary and idealistic ethics agree in repudiating the standpoint of narrow individualism, alike insist upon the necessity of regarding the self as social in character, and regard the end of moral progress as only realizable in a perfect society.

It is perhaps too much to hope that the long-continued controversy between hedonists and anti-hedonists has been finally settled. But certainly few modern moral philosophers would be found in the present day ready to defend the crudities of hedonistic psychology as they appear in Bentham and Mill. A certain common agreement has been reached concerning the impossibility of regarding pleasure as the sole motive criterion and end of moral action, though different opinions still prevail as to the place occupied by pleasure in the summum bonum, and the possibility of a hedonistic calculus.

The failure of "laissez-faire" individualism in politics to produce that common prosperity and happiness which its advocates hoped for caused men to question the egoistic basis upon which its ethical counterpart was constructed. Similarly the comparative failure of science to satisfy men's aspirations alike in knowledge and, so far as the happiness of the masses is concerned, in practice has been largely instrumental in producing that revolt against material prosperity as the end of conduct which is characteristic of idealist moral philosophy. To this revolt, and to the general tendency to find the principle of morality in an ideal good present to the consciousness of all persons capable of acting morally, the widespread recognition of reason as the ultimate court of appeal alike in religion or politics, and latterly in economics also, has no doubt contributed largely. In the main the appeal to reason has followed the traditional course of such movements in ethics, and has reaffirmed in the light of fuller reflection the moral principles implicit in the ordinary moral consciousness. It is only in the present day that there are noticeable signs of dissatisfaction with current morality itself, and a tendency to substitute or advocate a new morality based ostensibly upon conclusions derived from the facts of scientific observation.

Darwin himself seems never to have questioned, in the sceptical direction in which his followers have applied his principles, the absolute character of moral obligation. What interested him chiefly, in so far as he made a study of morality, was the development of moral conduct in its preliminary stages. He was principally concerned to show that in morality, as in other departments of human life, it was not necessary to postulate a complete and abrupt gap between human and merely animal existence, but that the instincts and habits which contribute to survival in the struggle for existence among animals develop into moral qualities which have a similar value for the preservation of human and social life. Regarding the social tendency as originally itself an instinct developed out of parental or filial affection, he seems to suggest that natural selection, which was the chief cause of its development in the earlier stages, may very probably influence the transition from purely tribal and social morality into morality in its later and more complex forms. But he admits that natural selection is not necessarily the only cause, and he refrains from identifying the fully developed morality of civilized nations with the "social instinct." Moreover, he recognizes that qualities, *e.g.* loyalty and sympathy, which may have been of great service to the tribe in its primitive struggle for existence, may become a positive hindrance to physical efficiency (leading as they do to the preservation of the unfit) at a later stage. Nevertheless to check our sympathy would lead to the "deterioration of the noblest part of our nature," and the question, which is obviously of vital importance, whether we should obey the dictates of reason, which would urge us only to such conduct as is conducive to natural selection, or remain faithful to the noblest part of our nature at the expense of reason, he leaves unsolved.

Darwin.

It was in Herbert Spencer, the triumphant "buccinator novi temporis," that the advocates of evolutionary ethics found their protagonist. Spencer looked to ideas derived from the biological sciences to provide a solution of all the enigmas of morality, as of most other departments of life; and he conceived it "to be the business of moral science to deduce from the laws of life and the conditions of existence what kinds of action necessarily tend to produce happiness and what kinds to produce unhappiness." It is clear, therefore, that any moral science which is to be of value must wait until the "laws of life" and "conditions of existence" have been satisfactorily determined, presumably by biology and the allied sciences; and

Spencer.

there are few more melancholy instances of failure in philosophy than the paucity of the actual results attained by Spencer in his lifetime in his application of the so-called laws of evolution to human conduct—a failure recognized by Spencer himself. His own contribution to ethics was vitiated at the outset by the fact that he never shook himself free from the trammels of the philosophy which his own system was intended to supersede. He began by disclaiming any affinity to Utilitarianism on the part of his own philosophy. He pointed out that the principle of the greatest happiness of the greatest number is a principle without any definite meaning, since men are nowhere unanimous in their standard of happiness, but regard the conception of happiness rather as a problem to be solved than a test to be applied. Universal happiness would require omniscience to legislate for it and the "normal" or, as some would say, "perfect" man to desire it; neither of these conditions of its realization is at present in existence. Further, the principle that "everybody is to count for one, nobody for more than one," is equally unsatisfactory. It may be taken to imply that the useless and the criminal should be entitled to as much happiness as the useful and the virtuous. While it gives no rule for private as distinct from public conduct, it provides no real guidance for the legislator. For neither happiness, nor the concrete means to happiness, nor finally the conditions of its realization can be distributed; and in the end "not general happiness becomes the ethical standard by which legislative action is to be guided, but universal justice." Yet the implications of this latter conclusion Spencer never fully thought out. He accepted bodily without farther questioning the hedonistic psychology by which the Utilitarians sought to justify their theory while he rejected the theory itself. Good, *e.g.* defined by him "as conduct conducive to life," is also further defined as that which is "conducive to a surplus of pleasures over pains." Happiness, again, is always regarded as consisting in feeling, ultimately in pleasant feeling, and there is no attempt to apply the same principles of criticism which he had successfully applied to the Utilitarians' "happiness" to the conception of "pleasure." And, though he maintains as against the Utilitarians the existence of certain fundamental moral intuitions which have come to be quite independent of any present conscious experience of their utility, he yet holds that they are the results of accumulated racial experiences gradually organized and inherited. Finally, side by side with a theory of the nature of moral obligation thus fundamentally empirical and a posteriori in its outlook, he maintains in his account of justice the existence of the idea of justice as distinct from a mere sentiment, carrying with it an a priori belief in its existence and identical in its a priori and intuitive character with the ultimate criterion of Utilitarianism itself. The fact is that any close philosophical analysis of Spencer's system of ethics can only result in the discovery of a multitude of mutually conflicting and for the most part logically untenable theories. It is frequently impossible to discover whether he wishes by an appeal to evolutionary principles to reinforce the sanctions and emphasize the absolute character of the traditional morality which in the main he accepts without question from the current opinions about conduct of his age, or whether he wishes to discredit and disprove the validity of that morality in order to substitute by the aid of the biological sciences a new ethical code. The argument, for instance, that intuitive and a priori beliefs gain their absolute character from the fact that they are the result of continued transmission and accumulation of past nervous modifications in the history of the race would, if taken seriously, lead us to the belief that ultimate ethical sanctions are to be sought, not by an appeal to the moral consciousness, but by the investigation of brain tissue and the relation of man's bodily organism to its environment. Yet such a view would be totally at variance with much that Spencer says (especially in his treatment of justice) concerning the trustworthiness and inevitable character of men's constant appeal to the intuitions of their moral consciousness. Moreover, the very fact itself of the possibility of inheriting acquired moral characteristics is still hotly debated by those biologists with whom should rest the ultimate verdict. Again, the argument that "conduct is good or bad according as its total effects are pleasurable or painful," and that ultimately "pleasure-giving acts are life-sustaining acts," seems to involve Spencer in a multitude of unverified assumptions and contradictory theories. In the first place it is never clear whether Spencer regards the fact that a particular course of conduct is accompanied by a feeling of pleasure as a test of its life-preserving and life-sustaining character, or whether he wishes us to use as our criterion of what is pleasant in conduct the fact that the conduct in question seems conducive to the continued existence of man's organic life. He apparently passes from one criterion to the other as best suits the purpose of the moment. He does not prove the coincidence of life-sustaining and pleasant activities. He assumes throughout that the pleasant is the opposite of what is painful, and seems unaware of the difficulty of determining by means of terms so highly abstract the specific character of moral action. We find in his theory no satisfactory attempt to discriminate between the pleasure aimed at by the altruist and the immediate pleasure of egoistic action. Similarly he disregards the distinction between pleasant feeling as an immediate motive of conduct and the idea of the attainment of future pleasure whether by the race or by the individual. Spencer is involved in effect in most of the confusions and contradictions of hedonistic psychology.

Nor is his attempt to construct a scientific criterion out of data derived from the biological sciences productive of satisfactory results. He is hampered by a distinction between "absolute" and "relative" ethics definitely formulated in the last two chapters of The *Data of Ethics*. Absolute ethics would deal with such laws as would regulate the conduct of ideal man in an ideal society, *i.e.* a society where conduct has reached the stage of complete adjustment to the needs of social life. Relative ethics, on the other hand, is concerned only with such conduct as is advantageous for that society which has not yet reached the end of complete adaptation to its environment, *i.e.* which is at present imperfect. It is hardly necessary to say that Spencer does not tell us how to bring the two ethical systems into correlation. And the actual criteria of conduct derived from biological considerations are almost

ludicrously inadequate. Conduct, *e.g.*, is said to be more moral in proportion as it exhibits a tendency on the part of the individual or society to become more "definite," "coherent" and "heterogeneous." Or, again, we should recognize as a test of the "authoritative" character of moral ideas or feelings the fact that they are complex and representative, referring to a remote rather than to a proximate good, remembering the while that "the sense of duty is transitory, and will diminish as fast as moralization increases." In fact, no acceptable scientific criterion emerges, and the outcome of Spencer's attempt to ascertain the laws of life and the conditions of existence is either a restatement of the dictates of the moral consciousness in vague and cumbrous quasi-scientific phraseology, or the substitution of the meaningless test of "survivability" as a standard of perfection for the usual and intelligible standards of "good" and "right."

A similar criticism might fairly be passed upon the majority of philosophers who approach ethics from the standpoint of evolution. Sir Leslie Stephen, for instance, wishes to substitute the conception of "social health" for that of universal happiness, and considers that the conditions of social health are to be discovered by an examination of the "social organism" or of "social tissue," the laws of which can be studied apart from those laws by which the individuals composing society regulate their conduct. "The social evolution means the evolution of a strong social tissue; the best type is the type implied by the strongest tissue." But on the important question as to what constitutes the strongest social tissue, or to what extent the analogy between society as at present constituted and organic life is really applicable, we are left without certain guidance. The fact is that with few exceptions evolutionary moral philosophers evade the choice between alternatives which is always presented to them. They begin, for the most part, with a belief that in ethics as in other departments of human knowledge "the more developed must be interpreted by the less developed"—though frequently in the sequel complexity or posteriority of development is erected as a standard by means of which to judge the process of development itself. They are not content to write a *history* of moral development, applying to it the principles by which Darwinians seek to explain the development of animal life. But the search of origins frequently leads them into theories of the nature of that moral conduct whose origin they are anxious to find quite at variance with current and accepted beliefs concerning its nature. The discovery of the so-called evolution of morality out of non-moral conditions is very frequently an unconscious subterfuge by which the evolutionist hides the fact that he is making a priori judgments upon the value of the moral concepts held to be evolved. To accept such theories of the origin of morality would carry with it the conviction that what we took for "moral" conduct was in reality something very different, and has been so throughout its history. The legitimate inference which should follow would be the denial of the validity of those moral laws which have hitherto been regarded as absolute in character, and the substitution for all customary moral terms of an entirely new set based upon biological considerations. But it is precisely this, the only logical inference, which most evolutionary philosophers are unwilling to draw. They cannot give up their belief in customary morality. Professor Huxley maintained, for example, in a famous lecture that "the ethical progress of society depends not on imitating the cosmic process, still less in running away from it, but in combating it" (*Romanes Lecture, ad fin.*). And very frequently arguments are adduced by evolutionists to prove that men's belief in the absolute character of moral precepts is one of the necessary means adopted by nature to carry out her designs for the social welfare of mankind. Yet the other alternative, to which such reasoning points, they are reluctant to accept. For the belief that moral obligation is absolute in character, that it is alike impossible to explain its origin and transcend its laws, would make the search for a scientific criterion of conduct to be deduced from the laws of life and conditions of existence meaningless, if not absurd.

Leslie Stephen.

Perhaps the one European thinker who has carried evolutionary principles in ethics to their logical conclusion is Friedrich Nietzsche. Almost any system of morality or immorality might find some justification in Nietzsche's writings, which are extraordinarily chaotic and full of the wildest exaggerations. Yet it has been a true instinct which has led popular opinion as testified to by current literature to find in Nietzsche the most orthodox exponent of Darwinian ideas in their application to ethics. For he saw clearly that to be successful evolutionary ethics must involve the "transvaluation of all values," the "demoralization" of all ordinary current morality. He accepted frankly the glorification of brute strength, superior cunning and all the qualities necessary for success in the struggle for existence, to which the ethics of evolution necessarily tend. He proclaimed himself, before everything else, a physiologist, and looked to physiology to provide the ultimate standard for everything that has value; and though his own ethical code necessarily involves the disappearance of sympathy, love, toleration and all existing altruistic emotions, he yet in a sense finds room for them in such altruistic self-sacrifice as prepares the way for the higher man of the future. Thus, after a fashion, he is able to reconcile the conflicting claims of egoism and altruism and succeed where most apostles of evolution fail. The Christian virtues, sympathy for the weak, the suffering, &c., represent a necessary stage to be passed through in the evolution of the *Übermensch*, *i.e.* the stage when the weak and suffering combine in revolt against the strong. They are to be superseded, not so much because all social virtues are to be scorned and rejected, as because in their effects, *i.e.* in their tendency to perpetuate and prolong the existence of the weak and those who are least well equipped and endowed by nature, they are anti-social in character and inimical to the survival of the strongest and most vigorous type of humanity. Consequently Nietzsche in effect maintains the following paradoxical position: he explains the existence of altruism upon egoistical principles; he advocates the total abolition of all altruism by carrying these same egoistical principles to their logical conclusion; he nevertheless appeals to that

Nietzsche.

moral instinct which makes men ready to sacrifice their own narrow personal interests to the higher good of society—an instinct profoundly altruistic in character—as the ultimate justification of the ethics he enunciates. Such a position is a *reductio ad absurdum* of the attempt to transcend the ultimate character of those intuitions and feelings which prompt men to benevolence. Thus, though incidentally there is much to be learned from Nietzsche, especially from his criticism of the ethics of pessimism, or from the strictures he passes upon the negative morality of extreme asceticism or quietism, his system inevitably provides its own refutation. For no philosophy which travesties the real course of history and distorts the moral facts is likely to commend itself to the sober judgment of mankind however brilliant be its exposition or ingenious its arguments. Finally, the conceptions of strength, power and masterfulness by which Nietzsche attempts to determine his own moral ideal, become, when examined, as relative and unsatisfactory as other criteria of moral action said to be deduced from evolutionary principles. Men desire strength or power not as ends but as means to ends beyond them; Nietzsche is most convincing when the *Übermensch* is left undefined. Imagined as ideal man, *i.e.* as morality depicts him, he becomes intelligible; imagined as Nietzsche describes him he reels back into the beast, and that distinction which chiefly separates man from the animal world out of which he has emerged, viz. his unique power of self-consciousness and self-criticism, is obliterated.

T.H. Green.

It was upon this crucial difficulty, *i.e.* the transition in the evolution of morality from the stage of purely animal and unconscious action to specifically human action,—*i.e.* action directed by self-conscious and purposive intelligence to an end conceived as good,—that the polemic of T.H. Green and his idealistic followers fastened. And it is perhaps unfortunate that metaphysical doctrines enunciated chiefly for the purposes of criticism not in themselves vitally necessary to the theory of morality propounded should have been regarded as the main contribution to ethical theory of idealist writers, and as such treated severely by hostile critics. Green's principal objection to evolutionary moral philosophy is contained in the argument that no merely "natural" explanation of the facts of morality is conceivable. The knowing consciousness,—*i.e.* so far as conduct is concerned the moral consciousness,—can never become an object of knowledge in the sense in which natural phenomena are objects of scientific knowledge. For such knowledge implies the existence of a knowing consciousness as a relating and uniting intelligence capable of distinguishing itself from the objects to which it relates. And more particularly the existence of the moral consciousness implies "the transition from mere want to consciousness of wanted object, from impulse to satisfy the want to effort for the realization of the wanted objects, implies the presence of the want to a subject which distinguishes itself from it." Consequently the facts of moral development imply with the emergence of human consciousness the appearance of something qualitatively different from the facts with which physiology for instance deals, imply a stratum as it were in development which no examination of animal tissues, no calculation of consequences with regard to the preservation of the species can ever satisfactorily explain. However far back we go in the history of humanity, if the presence of consciousness be admitted at all, it will be necessary to admit also the presence to consciousness of an ideal which can be accepted or rejected, of a power of looking before and after, and aiming at a future which is not yet fully realized. But unfortunately the temporary exigencies of criticism made it necessary for Green to emphasize the metaphysic of the self, *i.e.* to insist upon the necessity of a critical examination of the pre-requisites of any form of self-consciousness and especially of the knowing consciousness, to such an extent that critics have lost sight of the real dependence of his metaphysic upon the direct evidence of the moral consciousness. The philosophic value, the sincerity, the breadth and depth of his treatment of moral facts and institutions have been fully recognized. What has not been adequately realized is that the metaphysical basis of his system of ethics—the argument, for example, contained in the introduction to the *Prolegomena*—is unfairly treated if divorced from his treatment of morals as a whole, and that it can be justly estimated only if interpreted as much as the conclusion as the starting-point of moral theory. The doctrine of the eternity of the self, for instance, against which much criticism (*e.g.* Taylor, *The Problem of Conduct*, chap. ii.) has been directed, though it is chiefly expressed in the language of epistemology, has its roots nevertheless in the direct testimony of moral experience. For morality implies a power in the individual of rising above the interests of his own narrower self and identifying himself in the pursuit of a universal good with the true interests of all other selves. Similarly the conception of the self as a moral unity arises naturally out of the impossibility of finding the summum bonum in a succession of transient states of consciousness such as hedonism for example postulates. Good as a true universal can only be realized by a true self, and both imply a principle of unity not wholly expressible in terms of the particulars which it unifies. But whether the idealistic interpretation of the nature of universal good be the true one, *i.e.* whether we are justified in identifying that self-consciousness which is capable of grasping the principle of unity with the principle of unity which it grasps is a metaphysical and theistic problem comparatively irrelevant to Green's moral theory. It would be quite possible to accept his criticisms of naturalism and hedonism while rejecting many of the metaphysical inferences which he draws. A somewhat similar answer might be returned to those critics who find Green's use of the term "self-realization" or "self-development" as characteristic of the moral ideal unsatisfactory. It is quite easy to exhibit the futility of such a conception if understood formally for the practical purposes of moral philosophy. If the phrase be understood to mean the realization of some capacities of the self it does not appear to discriminate sufficiently between the good and bad capacities; while the realization under present conditions of all the capacities of a self is impossible. And to aim so far as is possible at all-round development would again ignore the distinction between vice and virtue. But used in the sense in

which Green habitually uses it self-realization implies, as he puts it, the fulfilment by the good man of his rational capacity or the idea of a best that is in time, *i.e.* the distinction between the good and the bad self is never ignored, but is the fundamental assumption of his theory. And if it be urged that the expression is in any case tautological, *i.e.* that the good is defined in terms of self-realization and self-realization in terms of the good, it may be doubted whether any rational system of ethics can avoid a similar imputation. Green would admit that in a certain sense the conception of "good" is indefinable, *i.e.* that it can only be recognized in the particulars of conduct of which it is the universal form. Only, therefore, to those philosophers who believe in the existence of a criterion of morality, *i.e.* a universal test such as that of pleasure, happiness and the like, by which we can judge of the worth of actions, will Green's position seem absurd; since, on the contrary, such conceptions as those of "self-development" or "self-realization" seem to have a definite and positive value if they call attention to the metaphysical implications of morality and accurately characterize the moral facts. What ambiguity they possess arises from the ambiguity of morality itself. For moral progress consists in the actualization of what is already potentially in existence. The striking merit of Green's moral philosophy is that the idealism which he advocates is rooted and grounded in moral habits and institutions: and the metaphysic in which it culminates is based upon principles already implicitly recognized by the moral consciousness of the ordinary man. Nothing could be farther from Green's teaching than the belief that constructive metaphysics could, unaided by the intuitions of the moral consciousness, discover laws for the regulation of conduct.

But although Green's loyalty to the primary facts of the moral consciousness prevented him from constructing a rationalistic system of morals based solely upon the conclusions of metaphysics, it was perhaps inevitable that the revival of interest in metaphysics so prominent in his own speculations should lead to a more daring criticism of ethical first principles in other writers. Bradley's *Ethical Studies* had presented with great brilliancy an idealist theory of morality not very far removed from that of Green's *Prolegomena*. But the publication of *Appearance and Reality* by the same author marked a great advance in philosophical criticism of ethical postulates, and a growing dissatisfaction with current reconciliations between moral first principles and the conclusions of metaphysics. *Appearance and Reality* was not primarily concerned with morals, yet it inevitably led to certain conclusions affecting conduct, and it was no very long time before these conclusions were elaborated in detail. Professor A.E. Taylor's *Problem of Conduct* (1901) is one of the most noteworthy and independent contributions to Moral Philosophy published in recent years. But it nevertheless follows in the main Bradley's line of criticism and may therefore be regarded as representative of his school. There are two principal positions in Professor Taylor's work:—(1) a refusal to base ethics upon metaphysics, and (2) the discovery of an irreconcilable dualism in the nature of morality which takes many shapes, but may be summarized roughly as consisting in an ultimate opposition between egoism and altruism. With regard to the first of these Taylor says (*op. cit.* p. 4) that his object is to show that "ethics is as independent of metaphysical speculation for its principles and methods as any of the so-called 'natural sciences'; that its real basis must be sought not in philosophical theories about the nature of the Absolute or the ultimate constitution of the Universe, but in the empirical facts of human life as they are revealed to us in our concrete everyday experience of the world and mankind, and sifted and systematized by the sciences of psychology and sociology.... Ethics should be regarded as a purely 'positive' or 'experimental' and not as a 'speculative' science." With regard to the second position one quotation will suffice (*op. cit.* p. 183). "Altruism and egoism are divergent developments from the common psychological root of primitive ethical sentiment. Both developments are alike unavoidable, and each is ultimately irreconcilable with the other. Neither egoism nor altruism can be made the sole basis of moral theory without mutilation of the facts, nor can any higher category be discovered by the aid of which their rival claims may be finally adjusted."

Taylor.

Professor Taylor expounds these two theories with great brilliance of argument and much ingenuity, yet neither of them will perhaps carry complete conviction to the minds of the majority of his critics. It is curious, in the first place, to find the independence of moral philosophy upon metaphysics supported by metaphysical arguments. For whatever may be the real character of the interrelation of moral and metaphysical first principles it is obvious that Taylor's own dissatisfaction with current moral principles arises from an inability to believe in their ultimate rationality, *i.e.* a belief that they are untenable from the standpoint of ultimate metaphysics; and perhaps the most interesting portion of his book is the chapter entitled "Beyond Good and Bad," in which the highest and final form of the ethical consciousness of mankind is subjected to searching criticism. But further, it is becoming increasingly apparent that psychology (upon which Taylor would base morality) itself involves metaphysical assumptions; its position in fact cannot be stated except as a metaphysical position, whether that of subjective idealism or any other. And the need which most philosophers have felt for some philosophical foundation for morality arises, not from any desire to subordinate moral insight to speculative theory, but because the moral facts themselves are inexplicable except in the light of first principles which metaphysics alone can criticize.

Taylor himself attempts to find the roots of ethics in the moral sentiments of mankind, the moral sentiments being primarily feelings or emotions, though they imply and result in judgments of approval and disapproval upon conduct. But it may be doubted whether he succeeds in clearly distinguishing ethical feelings from ethical judgments, and if they are to be treated as synonymous it seems difficult to avoid the conclusion that the implications of moral "judgment" must involve a reference to metaphysics.

Moreover, it is obvious that a great part of Taylor's quarrel with current moral ideals arises from the fact that they do not commend themselves to the moral judgment, *i.e.* from the standpoint of real goodness they are unsatisfactory, being tainted with evil. Hence it appears difficult to reconcile what is in effect a belief in the validity of the judgments of the moral consciousness with a belief that the real source and justification of that consciousness are to be found in the very sentiments and vague mass of floating feelings upon which it pronounces. Scepticism seems to be the only possible result of such a position. Taylor's polemic against metaphysical systems of ethics is based throughout upon an alleged discrepancy and separation between the facts of moral "experience," the judgments of the moral consciousness, and theories as to the nature of these which the philosophers whom he attacks would by no means accept. There is no doubt a distinction between morality as a form of consciousness and reflection upon that morality. But such a distinction neither corresponds to, nor testifies to, the existence of a distinction between morality as "experience" and morality as "theory" or "idea."

Taylor is more persuasive when he is developing his second main thesis—that of the alleged existence of an ultimate dualism in the nature of morality. His accounts of the genesis of the conceptions of obligation and responsibility as of most of the ultimate conceptions with which moral philosophy deals will be accepted or rejected to the extent to which the main contention concerning the psychological basis of ethics commends itself to the reader. But in his exposition of the fundamental contradiction involved in morality elaborated with much care and illustrative argument he appeals for the most part to facts familiar to the unphilosophical moral consciousness. He begins by finding an ultimate opposition between the instincts of self-assertion and instincts which secure the production and protection of the coming generation even in the infra-ethical world with which biology deals. He traces this opposition into the forms in which it appears in the social life of mankind (as, *e.g.*, in the difficulty of reconciling the conflicting claims of individual self-development and self-culture and social service), and finds "a hidden root of insincerity and hypocrisy beneath all morality" (p. 243), inasmuch as it is not possible to pursue any one type of ideal without some departure from singleness of purpose. And he finds all the conceptions by which men have hoped to reconcile admitted antagonisms and divergencies between moral ideals claiming to be ultimate and authoritative alike unsatisfactory (p. 285). Progress is illusory; there is no satisfactory goal to which moral development inevitably tends; religion in which some take refuge when distressed by the inexplicable contradictions of moral conduct itself "contains and rests upon an element of make believe" (p. 489).

With Taylor's presentation of the difficulties with which morality is expected to grapple probably few would be found seriously to disagree, though they might consider it unduly pessimistic. But when he turns what is in effect a statement of certain forms of moral difficulty into an attack upon the logical and coherent character of morality itself, he is not so likely to command assent. For the difficulty all men meet with in realizing goodness, or in being moral, is not in itself evidence of an inherent contradiction in the nature of goodness as such. And what perhaps would first strike an unprejudiced critic in Taylor's examples of conflicting ideals or antagonistic yet ultimate moral judgments would be the perception that they are not necessarily moral ideas or judgments at all, and hence necessarily not ultimate.

The claims of self-culture and of social service may when considered in the abstract or in some hypothetical case appear antagonistic and irreconcilable. But when they present themselves to the individual moral consciousness it may be safely asserted (1) that there can be only one moral choice possible, *i.e.* that their opposition (where they are opposed) involves no conflict of duties; and (2) that whichever ideal is in the end preferred, opportunities will nevertheless be provided within its realization for the concurrent realization of activities and capacities ordinarily associated with the ideal alleged to be contradictory. For just as there is no self-realization which does not involve self-sacrifice, so there is no room for that species of egoism within the confines of morality which is incompatible with social service.

It will be clear from the foregoing account of Taylor's work that the tendency of his thought, as of that of Bradley, is by no means directed to the confirmation or re-establishment of those principles of conduct recognized by the ordinary moral consciousness. Psychology or metaphysics tend in their systems to usurp the place of authority formerly assigned to ethics proper.

Martineau.

It would be true on the whole to assert that evolutionary systems of ethics such as those of Herbert Spencer, Sir Leslie Stephen or Professor S. Alexander (*Moral Order and Progress*, 1899), together with the metaphysical theories of morals of which T.H. Green and Bradley and Taylor are the chief representatives, have dominated the field of ethical speculation since 1870. Nevertheless it is only necessary to mention such a work as Martineau's *Types of Ethical Theory* to dispel the notion that the type of moral philosophy most characteristically English, *i.e.* consisting in the patient analysis of the form and nature of the moral consciousness itself, has given way or is likely to give way to more ambitious and constructive efforts. Martineau's chief endeavour was, as he himself says, to interpret, to vindicate, and to systematize the moral sentiments, and if the actual exhibition of what is involved, *e.g.*, in moral choice is the vindication of morality Martineau may be said to have been successful. It is with his interpretation and systematization of the moral sentiments that most of Martineau's critics have found fault. It is impossible, *e.g.*, to accept his ordered hierarchy of "springs of action" without perceiving that the real principle upon which they can be arranged in order at all must depend upon considerations of

circumstances and consequences, of stations and duties, with which a strict intuitionalism such as that of Martineau would have no dealing.[50] Similarly the notion of Conscience as a special faculty giving its pronouncements immediately and without reflection cannot be maintained in the face of modern psychological analysis and is untrue to the nature of moral judgment itself. And Martineau is curiously unsympathetic to the universal and social aspect of morality with which evolutionary and idealist moral philosophers are so largely occupied. Nevertheless there have been few moral philosophers who have, apart from the idiosyncrasies of their special prepossessions, set forth with clearer insight or with greater nobility of language the essential nature of the moral consciousness.

Equal in importance to Martineau's work is Professor Sidgwick's *Methods of Ethics* which appeared in 1874. The two works are alike in loftiness of outlook and in the fact that they are devoted to the re-examination of the nature of the moral consciousness to the exclusion of alien branches of inquiry. In most other respects they differ. Martineau is much more in sympathy with idealism than Sidgwick, whose work consists in a restatement from a novel and independent standpoint of the Utilitarian position. And Sidgwick has been far more successful than any other moral philosopher with the exception of T.H. Green and Bradley in founding a school of thought. Many of his most acute critics would be the first to admit how much they owe to his teaching. Chief among the more recent of these is G.E. Moore, whose book *Principia Ethica* is an important original contribution to ethical thought. And although Dr Hastings Rashdall (*The Theory of Good and Evil* Oxford, 1907) is not in agreement with Sidgwick's own particular type of hedonistic theory in his own philosophical position, he occupies a point of view somewhat similar to that of Sidgwick's main attitude of Rational Utilitarianism. Rashdall's two volumes exhibit also a welcome return on the part of English thought to the proper business of the moral philosopher—the examination of the nature of moral conduct. Other works, such as Professor L.T. Hobhouse's *Morals in Evolution* or Professor E.A. Westermarck's *Origin and Development of the Moral Ideas*, testify to a continued interest in the history of morality and in the anthropological inquiries with which moral philosophy is closely connected.

Sidgwick.

Much that is of importance for moral philosophy has recently been written upon problems that more properly belong to the philosophy of religion and the theory of knowledge. J.F. M'Taggart's *Studies in Hegelian Cosmology*, and his later work, *Some Dogmas of Religion*, contain interesting contributions to the theory of pleasure and of the problem of free will and determinism. A notable instance of this tendency is seen in the developments of the theory of pragmatism (*q.v.*), for which F.C.S. Schiller has proposed the general term "humanism." Such aspects as concern ethics include, for example, the limited indeterminism involved in the theory, the attitude of the religious consciousness expressed by William James (*Will to Believe* and *Pragmatism*), and the pragmatic conception of the good. And the widespread interest in social problems has produced a revival of speculation concerning questions partly political and party ethical in character, *e.g.* the nature of justice. Finally it has become apparent that many problems hitherto left for political economy to solve belong more properly to the moralist, if not to the moral philosopher, and it may be confidently expected that with the increased complexity of social life and the disappearance of many sanctions of morality hitherto regarded as inviolable, the future will bring a renewed and practical interest in the theory of conduct likely to lead to fresh developments in ethical speculation.

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(H. H. W.)

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1 This well-known phrase was originally attributed to the Pythagoreans.

2 It is highly characteristic of Platonism that the issue in this dialogue, as originally stated, is between virtue and vice, whereas, without any avowed change of ground, the issue ultimately discussed is between the philosophic life and the life of vulgar ambition or sensual enjoyment.

3 This cardinal term is commonly translated "happiness"; and it must be allowed that it is the most natural term for what we (in English) agree to call "our being's end and aim." But happiness so definitely signifies a state of feeling that it will not admit the interpretation that Aristotle (as well as Plato and the Stoics) expressly gives to εὐδαιμονία; the confusion is best avoided by rendering the word by the less familiar "well-being."

4 Aristotle follows Plato and Socrates in identifying the notions of καλός ("fair," "beautiful") and ἀγαθός ("good") in their application to conduct. We may observe, however, that while the latter term is used to denote the virtuous man, and (in the neuter) equivalent to End generally, the former is rather chosen to express the quality of virtuous acts which in any particular case is the end of the virtuous agent. Aristotle no doubt faithfully represents the common sense of Greece in considering that, in so far as virtue is in itself good to the virtuous agent, it belongs to that species of good which we distinguish as beautiful. In later Greek philosophy the term καλόν ("honestum") became still more technical in the signification of "morally good."

5 The above account is considerably expanded in H. Sidgwick's *Hist. of Ethics* (5th ed., 1902), pp. 59-70.

6 There is a certain difficulty in discussing Aristotle's views on the subject of practical wisdom, and the relation of the intellect to moral action, since it is most probable that the only accounts that we have of these views are not part of the genuine writings of Aristotle. Still books vi. and vii. of the *Nicomachean Ethics* contain no doubt as pure Aristotelian doctrine as a disciple could give, and appear to supply a sufficient foundation for the general criticism expressed in the text.

7 It has been suggestively said that Cynicism was to Stoicism what monasticism was to early Christianity. The analogy, however, must not be pressed too far, since orthodox Stoics do not ever seem to have regarded Cynicism as the more perfect way.

8 The Stoics were not quite agreed as to the immutability of virtue, but they were agreed that, when once possessed, it could only be lost through the loss of reason itself.

9 Hence some members of the school, without rejecting the definition of virtue = knowledge, also defined it as "strength and force."

10 It is apparently in view of this union in reason of rational beings that friends are allowed to be "external goods" to the sage, and that the possession of good children is also counted a good.

11 The Stoics seem to have varied in their view of "good repute," εὐδοξία; at first, when the school was more under the influence of Cynicism, they professed an outward as well as an inward indifference to it; ultimately they conceded the point to common sense, and included it among προηγμένα.

12 It is noted of him that he did not disdain the co-operation either of women or of slaves in his philosophical labours.

13 The last charge of Epicurus to his disciples is said to have been, τῶν δογμάτων μεμνῆσθαι.

14 Epictetus.

15 Marcus Aurelius.

16 *E.g.* Justin Martyr, Origen, Tertullian, Cyprian.

17 Citra sanguinis effusionem.

18 To show the crudity of the notion of redemption in early Christianity, it is sufficient to mention that many fathers represent Christ's ransom as having been paid to the devil; sometimes adding that by the concealment of Christ's divinity under the veil of humanity a certain deceit was (fairly) practised on the great deceiver.

19 It is to be observed that Augustine prefers to use "freedom" not for the power of willing either good or evil, but the power of willing good. The highest freedom, in his view, excludes the possibility of willing evil.

20 Cicero's works are unimportant in the history of ancient ethics, as their philosophical matter was entirely borrowed from Greek treatises now lost; but the influence exercised by them (especially by the *De officiis*)

over medieval and even modern readers was very considerable.

21 Abelard afterwards retracted this view, at least in its extreme form; and in fact does not seem to have been fully conscious of the difference between (1) unfulfilled intention to do an act objectively right, and (2) intention to do what is merely believed by the agent to be right.

22 He was condemned by two synods, in 1121 and 1140.

23 *Synderesis* (Gr. συντήρησις, from συντηρεῖν, to watch closely, observe) is used in this sense in Jerome (*Com. in Ezek*. i. 4-10).

24 The refusal of the council of Constance to condemn Jean Petit's advocacy of assassination is a striking example of this weakness. Cf. Milman, *Lat. Christ*. book xiii. c. 9.

25 As the chief English casuists we may mention Perkins, Hall, Sanderson, as well as the more eminent Jeremy Taylor, whose *Ductor dubitantium* appeared in 1660.

26 This influence was not exercised in the region of ethics. Bacon's brief outline of moral philosophy (in the *Advancement of Learning*, ii. 20-22) is highly pregnant and suggestive. But Bacon's great task of reforming scientific method was one which, as he conceived it, left morals on one side; he never made any serious effort to reduce his ethical views to a coherent system, methodically reasoned on an independent basis. The outline given in the *Advancement* was never filled in, and does not seem to have had any effect on the subsequent course of ethical speculation.

27 He even identifies the desire with the pleasure, apparently regarding the stir of appetite and that of fruition as two parts of the same "motion."

28 In spite of Hobbes's uncompromising egoism, there is a noticeable discrepancy between his theory of the ends that men naturally seek and his standard for determining their natural rights. This latter is never Pleasure simply, but always Preservation—though on occasion he enlarges the notion of "preservation" into "preservation of life so as not to be weary of it." His view seems to be that in a state of nature *most* men *will* fight, rob, &c., "for delectation merely" or "for glory," and that hence all men must be allowed an indefinite right to fight, rob, &c., "for preservation."

29 It should be noticed, however, that it is only in his treatment of Equity and Benevolence that he really follows out the mathematical analogy (cf. Sidgwick's *History of Ethics*, 5th ed., pp. 180-181).

30 It should be observed that, while Clarke is sincerely anxious to prove that most principles are binding independently of Divine appointment, he is no less concerned to show that morality requires the practical support of revealed religion.

31 Three classes of impulses are thus distinguished by Shaftesbury:—(1) "Natural Affections," (2) "Self-affections," and (3) "Un-natural Affections." Their characteristics are further considered in the *History of Ethics*, p. 186 seq.

32 In a remarkable passage near the close of his eleventh sermon Butler seems even to allow that conscience would have to give way to self-love, if it were possible (which it is not) that the two should come into ultimate and irreconcilable conflict.

33 It is worth noticing that Hutcheson's express definition of the object of self-love includes "perfection" as well as "happiness"; but in the working out of his system he considers private good exclusively as happiness or pleasure.

34 Hume's ethical view was finally stated in his *Inquiry into the Principles of Morals* (1751), which is at once more popular and more purely utilitarian than his earlier work.

35 Hume remarks that in some cases, by "association of ideas," the rule by which we praise and blame is extended beyond the principle of utility from which it arises; but he allows much less scope to this explanation in his second treatise than in his first.

36 In earlier editions of the *Inquiry* Hume expressly included all approved qualities under the general notion of "virtue." In later editions he avoided this strain on usage by substituting or adding "merit" in several passages—allowing that some of the laudable qualities which he mentions would be more commonly called "talents," but still maintaining that "there is little distinction made in our internal estimation" of "virtues" and "talents."

37 It is to be observed that whereas Price and Stewart (after Butler) identify the object of self-love with happiness or pleasure, Reid conceives this "good" more vaguely as including perfection and happiness; though he sometimes uses "good" and happiness as convertible terms, and seems practically to have the latter in view in all that he says of self-love.

38 *E.g.* Reid proposes to apply this principle in favour of monogamy, arguing from the proportion of males and females born; without explaining why, if the intention of nature hence inferred excludes occasional polygamy, it does not also exclude occasional celibacy.

39 We may observe that some recent writers, who would generally be included in this school, avoid in various ways the difficulty of constructing a code of external conduct. Sometimes they consider moral intuition as determining the comparative excellence of conflicting motives (James Martineau), or the comparative quality of pleasures chosen (Laurie), which seems to be the same view in a hedonistic garb; others hold that what is intuitively perceived is the rightness or wrongness of individual acts—a view which obviously renders ethical reasoning practically superfluous.

40 The originality—such as it is—of Paley's system (as of Bentham's) lies in its method of working out details rather than in its principles of construction. Paley expressly acknowledges his obligations to the original and suggestive, though diffuse and whimsical, work of Abraham Tucker (*Light of Nature Pursued*, 1768-1774). In this treatise, as in Paley's, we find "every man's own satisfaction, the spring that actuates all his motives," connected with "general good, the root whereout all our rules of conduct and sentiments of

honour are to branch," by means of natural theology demonstrating the "unniggardly goodness of the author of nature." Tucker is also careful to explain that satisfaction or pleasure is "one and the same in kind, however much it may vary in degree, ... whether a man is pleased with hearing music, seeing prospects, tasting dainties, performing laudable actions, or making agreeable reflections," and again that by "general good" he means "quantity of happiness," to which "every pleasure that we do to our neighbour is an addition." There is, however, in Tucker's theological link between private and general happiness a peculiar ingenuity which Paley's common sense has avoided. He argues that men having no free will have really no desert; therefore the divine equity must ultimately distribute happiness in equal shares to all; therefore I must ultimately increase my own happiness most by conduct that adds most to the general fund which Providence administers.

But in fact the outline of Paley's utilitarianism is to be found a generation earlier—in Gay's dissertation prefixed to Law's edition of King's *Origin of Evil*—as the following extracts will show:—"The idea of virtue is the conformity to a rule of life, directing the actions of all rational creatures with respect to each other's happiness; to which every one is always obliged.... Obligation is the necessity of doing or omitting something in order to be happy.... Full and complete obligation which will extend to all cases can only be that arising from the authority of God.... The will of God [so far as it directs behaviour to others] is the immediate rule or criterion of virtue ... but it is evident from the nature of God that he could have no other design in creating mankind than their happiness; and therefore he wills their happiness; therefore that my behaviour so far as it may be a means to the happiness of mankind should be such; so this happiness of mankind may be said to be the criterion of virtue once removed."

The same dissertation also contains the germ of Hartley's system, as we shall presently notice.

41 It must be allowed that Paley's application of this argument is somewhat loosely reasoned, and does not sufficiently distinguish the consequence of a single act of beneficent manslaughter from the consequences of a general permission to commit such acts.

42 This list gives twelve out of the fourteen classes in which Bentham arranges the springs of action, omitting the religious sanction (mentioned afterwards), and the pleasures and pains of self-interest, which include all the other classes except sympathy and antipathy.

43 In the *Deontology* published by Bowring from MSS. left after Bentham's death, the coincidence is asserted to be complete.

44 It should be observed that Austin, after Bentham, more frequently uses the term "moral" to connote what he more distinctly calls "positive morality," the code of rules supported by common opinion in any society.

45 In the before-mentioned dissertation. Cf. note 2 to p. 835. Hartley refers to this treatise as having supplied the starting-point for his own system.

46 It should be noticed that Hartley's sensationalism is far from leading him to exalt the corporeal pleasures. On the contrary, he tries to prove elaborately that they (as well as the pleasures of imagination, ambition, self-interest) cannot be made an object of primary pursuit without a loss of happiness on the whole—one of his arguments being that these pleasures occur earlier in time, and "that which is prior in the order of nature is always less perfect than that which is posterior."

47 It may be observed that in the view of Kant and others (2) and (3) are somewhat confusingly blended.

48 Singularly enough, the English writer who approaches most nearly to Kant on this point is the utilitarian Godwin, in his *Political Justice*. In Godwin's view, reason is the proper motive to acts conducive to general happiness: reason shows me that the happiness of a number of other men is of more value than my own; and the perception of this truth affords me at least *some* inducement to prefer the former to the latter. And supposing it to be replied that the motive is really the moral uneasiness involved in choosing the selfish alternative, Godwin answers that this uneasiness, though a "constant step" in the process of volition, is a merely "accidental" step—"I feel pain in the neglect of an act of benevolence, because benevolence is judged by me to be conduct which it becomes me to adopt."

49 In Kantism, as we have partly seen, the most important ontological beliefs—in God, freedom and immortality of the soul—are based on necessities of ethical thought. In Fichte's system the connexion of ethics and metaphysics is still more intimate; indeed, we may compare it in this respect to Platonism; as Plato blends the most fundamental notions of each of these studies in the one idea of good, so Fichte blends them in the one idea free-will. "Freedom," in his view, is at once the foundation of all being and the end of all moral action. In the systems of Schelling and Hegel ethics falls again into a subordinate place; indeed, the ethical view of the former is rather suggested than completely developed. Neither Fichte nor Schelling has exercised more than the faintest and most indirect influence on ethical philosophy in England; it therefore seems best to leave the ethical doctrines of each to be explained in connexion with the rest of his system.

50 Cf. A. Seth Pringle-Pattison, *The Philosophical Radicals. Martineau's Philosophy*, p. 92.

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