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THE ENCYCLOPÆDIA BRITANNICA

A DICTIONARY OF ARTS, SCIENCES, LITERATURE AND GENERAL INFORMATION

ELEVENTH EDITION

VOLUME XVII SLICE IV

Magnetite to Malt

Articles in This Slice

MAGNETITE, a mineral forming the natural magnet (see Magnetism), and important also as an iron-ore. It is an iron-black, opaque mineral, with metallic lustre; hardness about 6, sp. gr. 4.9 to 5.2. When scratched, it yields a black streak. It is an oxide of iron having the formula Fe_3O_4, corresponding with 72.4% of metal, whence its great value as an ore. It may be regarded as a ferroso-ferric oxide, $FeO{\cdot}Fe_2O_3$, or as iron ferrate, $Fe''Fe_2'''O_4$. Titanium is often present, and occasionally the mineral contains magnesium, nickel, &c. It is always strongly magnetic. Magnetite crystallizes in the cubic system, usually in octahedra, less commonly in rhombic dodecahedra, and not infrequently in twins of the "spinel type" (fig. 1). The rhombic faces of the dodecahedron are often striated parallel to the longer diagonal. There is no distinct cleavage, but imperfect parting may be obtained along octahedral planes.

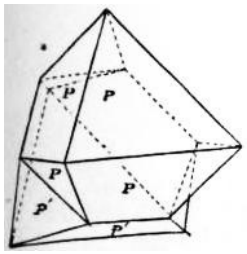

Fig. 1.

Magnetite is a mineral of wide distribution, occurring as grains in many massive and volcanic rocks, like granite, diorite and dolerite. It appears to have crystallized from the magma at a very early period of consolidation. Its presence contributes to the dark colour of many basalts and other basic rocks, and may cause them to disturb the compass. Large ore-bodies of granular and compact magnetite occur as beds and lenticular masses in Archean gneiss and crystalline schists, in various parts of Norway, Sweden, Finland and the Urals; as also in the states of New York, New Jersey, Pennsylvania and Michigan, as well as in Canada. In some cases it appears to have segregated from a basic eruptive magma, and in other cases to have resulted from metamorphic action. Certain deposits appear to have been formed, directly or indirectly, by wet processes. Iron rust sometimes contains magnetite. An interesting deposit of oolitic magnetic ore occurs in the Dogger (Inferior Oolite) of Rosedale Abbey, in Yorkshire; and a somewhat similar pisolitic ore, of Jurassic age, is known on the continent as chamoisite, having been named from Chamoison (or Chamoson) in the Valais, Switzerland. Grains of magnetite occur in serpentine, as an alteration-product of the olivine. In emery, magnetite in a granular form is largely associated with the corundum; and in certain kinds of mica magnetite occurs as thin dendritic enclosures. Haematite is sometimes magnetic, and A. Liversidge has shown that magnetite is probably present. By deoxidation, haematite may be converted into magnetite, as proved by certain pseudomorphs; but on the other hand magnetite is sometimes altered to haematite. On weathering, magnetite commonly passes into limonite, the ferrous oxide having probably been removed by carbonated waters. Closely related to magnetite is the rare volcanic mineral from Vesuvius, called magnoferrite, or magnesioferrite, with the formula $MgFe_2O_4$; and with this may be mentioned a mineral from Jakobsberg, in Vermland, Sweden, called jakobsite, containing $MnFe_2O_4$.

(F. W. R.*)

MAGNETOGRAPH, an instrument for continuously recording the values of the magnetic elements, the three universally chosen being the declination, the horizontal component and the vertical component (see Terrestrial Magnetism). In each case the magnetograph only records the variation of the element, the absolute values being determined by making observations in the neighbourhood with the unifilar magnetometer (*q.v.*) and inclinometer (*q.v.*).

Declination.—The changes in declination are obtained by means of a magnet which is suspended by a long fibre and carries a mirror, immediately below which a fixed mirror is attached to the base of the instrument. Both mirrors are usually concave; if plane, a concave lens is placed immediately before them. Light passing through a vertical slit falls upon the mirrors, from which it is reflected, and two images of the slit are produced, one by the movable mirror attached to the magnet and the other by the fixed mirror. These images would be short lines of light; but a piano-cylindrical lens is placed with its axis horizontal just in front of the recording surface. In this way a spot of light is obtained from each mirror. The recording surface is a sheet of

photographic paper wrapped round a drum which is rotated at a constant speed by clockwork about a horizontal axis. The light reflected from the fixed mirror traces a straight line on the paper, serving as a base line from which the variations in declination are measured. As the declination changes the spot of light reflected from the magnet mirror moves parallel to the axis of the recording drum, and hence the distance between the line traced by this spot and the base line gives, for any instant, on an arbitrary scale the difference between the declination and a constant angle, namely, the declination corresponding to the base line. The value of this constant angle is obtained by comparing the record with the value for the declination as measured with a magnetometer. The value in terms of arc of the scale of the record can be obtained by measuring the distance between the magnet mirror and the recording drum, and in most observations it is such that a millimetre on the record represents one minute of arc. The time scale ordinarily employed is 15 mm. per hour, but in modern instruments provision is generally made for the time scale to be increased at will to 180 mm. per hour, so that the more rapid variations of the declination can be followed. The advantages of using small magnets, so that their moment of inertia may be small and hence they may be able to respond to rapid changes in the earth's field, were first insisted upon by E. Mascart,[1] while M. Eschenhagen[2] first designed a set of magnetographs in which this idea of small moment of inertia was carried to its useful limit, the magnets only weighing 1.5 gram each, and the suspension consisting of a very fine quartz fibre.

Horizontal Force.—The variation of the horizontal force is obtained by the motion of a magnet which is carried either by a bifilar suspension or by a fairly stiff metal wire or quartz fibre. The upper end of the suspension is turned till the axis of the magnet is at right angles to the magnetic meridian. In this position the magnet is in equilibrium under the action of the torsion of the suspension and the couple exerted by the horizontal component, H, of the earth's field, this couple depending on the product of H into the magnetic moment, M, of the magnet. Hence if H varies the magnet will rotate in such a way that the couple due to torsion is equal to the new value of H multiplied by M. Since the movements of the magnet are always small, the rotation of the magnet is proportional to the change in H, so long as M and the couple, θ, corresponding to unit twist of the suspension system remain constant. When the temperature changes, however, both M and θ in general change. With rise of temperature M decreases, and this alone will produce the same effect as would a decrease in H. To allow for this effect of temperature a compensating system of metal bars is attached to the upper end of the bifilar suspension, so arranged that with rise of temperature the fibres are brought nearer together and hence the value of θ decreases. Since such a decrease in θ would by itself cause the magnet to turn in the same direction as if H had increased, it is possible in a great measure to neutralize the effects of temperature on the reading of the instrument. In the case of the unifilar suspension, the provision of a temperature compensation is not so easy, so that what is generally done is to protect the instrument from temperature variation as much as possible and then to correct the indications so as to allow for the residual changes, a continuous record of the temperature being kept by a recording thermograph attached to the instrument. In the Eschenhagen pattern instrument, in which a single quartz fibre is used for the suspension, two magnets are placed in the vicinity of the suspended magnet and are so arranged that their field partly neutralizes the earth's field; thus the torsion required to hold the magnet with its axis perpendicular to the earth's field is reduced, and the arrangement permits of the sensitiveness being altered by changing the position of the deflecting magnets. Further, by suitably choosing the positions of the deflectors and the coefficient of torsion of the fibre, it is possible to make the temperature coefficient vanish. (See Adolf Schmidt, *Zeits. für Instrumentenkunde*, 1907, 27, 145.) The method of recording the variations in H is exactly the same as that adopted in the case of the declination, and the sensitiveness generally adopted is such that 1 mm. on the record represents a change in H of .00005 C.G.S., the time scale being the same as that employed in the case of the declination.

Vertical Component.—To record the variations of the vertical component use is made of a magnet mounted on knife edges so that it can turn freely about a horizontal axis at right angles to its length (H. Lloyd, *Proc. Roy. Irish Acad.*, 1839, 1, 334). The magnet is so weighted that its axis is approximately horizontal, and any change in the inclination of the axis is observed by means of an attached mirror, a second mirror fixed to the stand serving to give a base line for the records, which are obtained in the same way as in the case of the declination. The magnet is in equilibrium under the influence of the couple VM due to the vertical component V, and the couple due to the fact that the centre of gravity is slightly on one side of the knife-edge. Hence when, say, V decreases the couple VM decreases, and hence the north end of the balanced magnet rises, and vice versa. The chief difficulty with this form of instrument is that it is very sensitive to changes of temperature, for such changes not only alter M but also in general cause the centre of gravity of the system to be displaced with reference to the knife-edge. To reduce these effects the magnet is fitted with compensating bars, generally of zinc, so adjusted by trial that as far as possible they neutralize the effect of changes of temperature. In the Eschenhagen form of vertical force balance two deflecting magnets are used to partly neutralize the vertical component, so that the centre of gravity is almost exactly over the support. By varying the positions of these deflecting magnets it is possible to compensate for the effects of changes of temperature (A. Schmidt, *loc. cit.*). In order to eliminate the irregularity which is apt to be introduced by dust, &c., interfering with the working of the knife-edge, W. Watson (*Phil. Mag.*, 1904 [6], 7, 393) designed a form of vertical force balance in which the magnet with its mirror is attached to the mid point of a horizontal stretched quartz fibre. The temperature compensation is obtained by attaching a small weight to the magnet, and then bringing it back to the horizontal position by twisting the fibre.

The scale values of the records given by the horizontal and vertical force magnetographs are determined by deflecting the respective needles, either by means of a magnet placed at a known distance or by passing an electric current through circular coils of large diameter surrounding the instruments.

The width of the photographic sheet which receives the spot of light reflected from the mirrors in the above instruments is generally so great that in the case of ordinary changes the curve does not go off the paper. Occasionally, however, during a disturbance such is not the case, and hence a portion of the trace would be lost. To overcome this difficulty Eschenhagen in his earlier type of instruments attached to each magnet two mirrors, their planes being inclined at a small angle so that when the spot reflected from one mirror goes off the paper, that corresponding to the other comes on. In the later pattern a third mirror is added of which the plane is inclined at about 30° to the horizontal. The light from the slit is reflected on to this mirror by an inclined fixed mirror, and after reflection at the movable mirror is again reflected at the fixed mirror and so reaches the recording drum. By this arrangement the angular rotation of the reflected beam is less than that of the magnet, and hence the spot of light reflected from this mirror yields a trace on a much smaller scale than that given by the ordinary mirror and serves to give a complete record of even the most energetic

disturbance.

See also Balfour Stewart, *Report of the British Association*, Aberdeen, 1859, 200, a description of the type of instrument used in the older observatories; E. Mascart, *Traité de magnétisme terrestre*, p. 191; W. Watson, *Terrestrial Magnetism*, 1901, 6, 187, describing magnetographs used in India; M. Eschenhagen, *Verhandlungen der deutschen physikalischen Gesellschaft*, 1899, 1, 147; *Terrestrial Magnetism*, 1900, 5, 59; and 1901, 6, 59; *Zeits. für Instrumentenkunde*, 1907, 27, 137; W. G. Cady, *Terrestrial Magnetism*, 1904, 9, 69, describing a declination magnetograph in which the record is obtained by means of a pen acting on a moving strip of paper, so that the curve can be consulted at all times to see whether a disturbance is in progress.

The effects of temperature being so marked on the readings of the horizontal and vertical force magnetographs, it is usual to place the instruments either in an underground room or in a room which, by means of double walls and similar devices, is protected as much as possible from temperature changes. For descriptions of the arrangements adopted in some observatories see the following: U.S. observatories, *Terrestrial Magnetism*, 1903, 8, 11; Utrecht, *Terrestrial Magnetism*, 1900, 5, 49; St Maur, *Terrestrial Magnetism*, 1898, 3, 1; Potsdam, *Veröffentlichungen des k. preuss. meteorol. Instituts*, "Ergebnisse der magnetischen Beobachtungen in Potsdam in den Jahren 1890 und 1891;" Pavlovsk, "Das Konstantinow'sche meteorologische und magnetische Observatorium in Pavlovsk," *Ausgabe der kaiserl. Akad. der Wissenschaften zu St Petersburg*, 1895.

(W. Wn.)

1 *Report British Association*, Bristol, 1898, p. 741.

2 *Verhandlungen der deutschen physikalischen Gesellschaft*, 1899, 1, 147; or *Terrestrial Magnetism*, 1900, 5, 59.

MAGNETOMETER,

a name, in its most general sense, for any instrument used to measure the strength of any magnetic field; it is, however, often used in the restricted sense of an instrument for measuring a particular magnetic field, namely, that due to the earth's magnetism, and in this article the instruments used for measuring the value of the earth's magnetic field will alone be considered.

The elements which are actually measured when determining the value of the earth's field are usually the declination, the dip and the horizontal component (see Magnetism, Terrestrial). For the instruments and methods used in measuring the dip see Inclinometer. It remains to consider the measurement of the declination and the horizontal component, these two elements being generally measured with the same instrument, which is called a unifilar magnetometer.

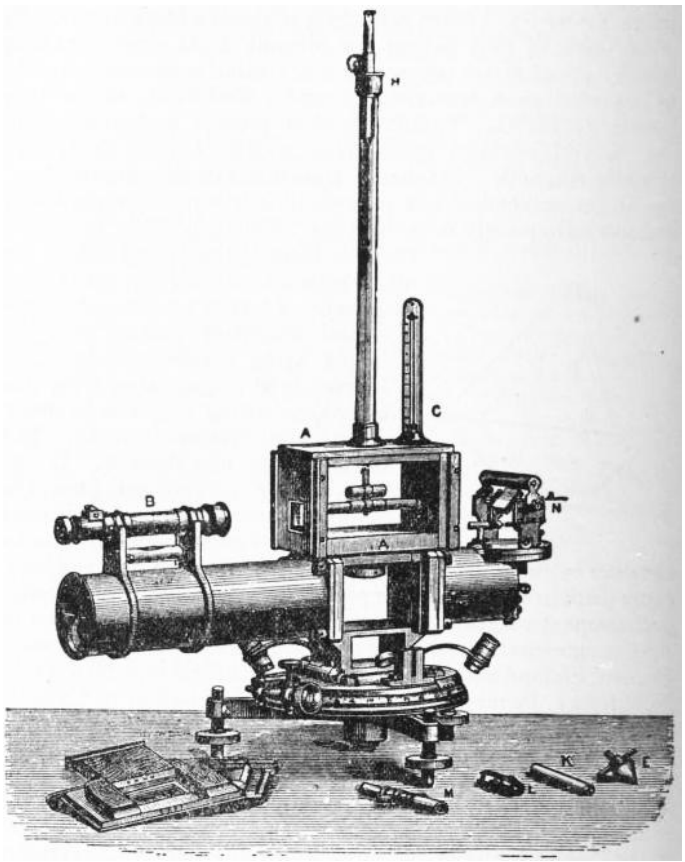

Fig. 1.—Unifilar Magnetometer, arranged to indicate declination.

Measurement of Declination.—The measurement of the declination involves two separate observations, namely, the determination of (*a*) the magnetic meridian and (*b*) the geographical meridian, the angle between the two being the declination. In order to determine the magnetic meridian the orientation of the magnetic axis of a freely suspended magnet is observed; while, in the absence of a distant mark of which the azimuth is

known, the geographical meridian is obtained from observations of the transit of the sun or a star. The geometrical axis of the magnet is sometimes defined by means of a mirror rigidly attached to the magnet and having the normal to the mirror as nearly as may be parallel to the magnetic axis. This arrangement is not very convenient, as it is difficult to protect the mirror from accidental displacement, so that the angle between the geometrical and magnetic axes may vary. For this reason the end of the magnet is sometimes polished and acts as the mirror, in which case no displacement of the reflecting surface with reference to the magnet is possible. A different arrangement, used in the instrument described below, consists in having the magnet hollow, with a small scale engraved on glass firmly attached at one end, while to the other end is attached a lens, so chosen that the scale is at its principal focus. In this case the geometrical axis is the line joining the central division of the scale to the optical centre of the lens. The position of the magnet is observed by means of a small telescope, and since the scale is at the principal focus of the lens, the scale will be in focus when the telescope is adjusted to observe a distant object. Thus no alteration in the focus of the telescope is necessary whether we are observing the magnet, a distant fixed mark, or the sun.

The Kew Observatory pattern unifilar magnetometer is shown in figs. 1 and 2. The magnet consists of a hollow steel cylinder fitted with a scale and lens as described above, and is suspended by a long thread of unspun silk, which is attached at the upper end to the torsion head H. The magnet is protected from draughts by the box A, which is closed at the sides by two shutters when an observation is being taken. The telescope B serves to observe the scale attached to the magnet when determining the magnetic meridian, and to observe the sun or star when determining the geographical meridian.

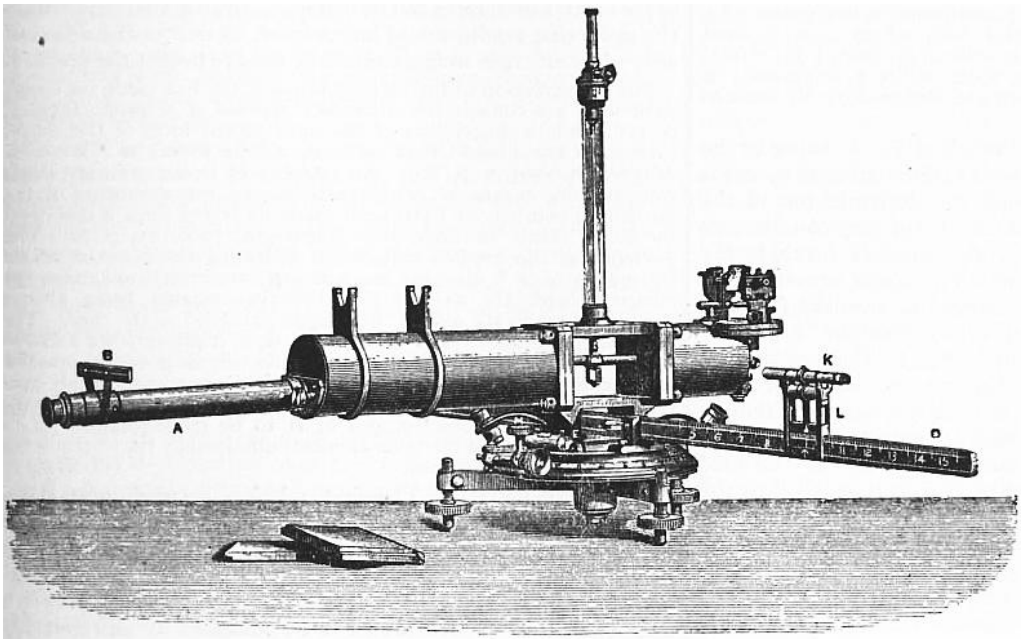

Fig. 2.—Unifilar Magnetometer, arranged to show deflexion.

When making a determination of declination a brass plummet having the same weight as the magnet is first suspended in its place, and the torsion of the fibre is taken out. The magnet having been attached, the instrument is rotated about its vertical axis till the centre division of the scale appears to coincide with the vertical cross-wire of the telescope. The two verniers on the azimuth circle having been read, the magnet is then inverted, *i.e.* turned through 180° about its axis, and the setting is repeated. A second setting with the magnet inverted is generally made, and then another setting with the magnet in its original position. The mean of all the readings of the verniers gives the reading on the azimuth circle corresponding to the magnetic meridian. To obtain the geographical meridian the box A is removed, and an image of the sun or a star is reflected into the telescope B by means of a small transit mirror N. This mirror can rotate about a horizontal axis which is at right angles to the line of collimation of the telescope, and is parallel to the surface of the mirror. The time of transit of the sun or star across the vertical wire of the telescope having been observed by means of a chronometer of which the error is known, it is possible to calculate the azimuth of the sun or star, if the latitude and longitude of the place of observation are given. Hence if the readings of the verniers on the azimuth circle are made when the transit is observed we can deduce the reading corresponding to the geographical meridian.

The above method of determining the geographical meridian has the serious objection that it is necessary to know the error of the chronometer with very considerable accuracy, a matter of some difficulty when observing at any distance from a fixed observatory. If, however, a theodolite, fitted with a telescope which can rotate about a horizontal axis and having an altitude circle, is employed, so that when observing a transit the altitude of the sun or star can be read off, then the time need only be known to within a minute or so. Hence in more recent patterns of magnetometer it is usual to do away with the transit mirror method of observing and either to use a separate theodolite to observe the azimuth of some distant object, which will then act as a fixed mark when making the declination observations, or to attach to the magnetometer an altitude telescope and circle for use when determining the geographical meridian.

The chief uncertainty in declination observations, at any rate at a fixed observatory, lies in the variable torsion of the silk suspension, as it is found that, although the fibre may be entirely freed from torsion before beginning the declination observations, yet at the conclusion of these observations a considerable amount of torsion may have appeared. Soaking the fibre with glycerine, so that the moisture it absorbs does not change so much with the hygrometric state of the air, is of some advantage, but does not entirely remove the difficulty. For this reason some observers use a thin strip of phosphor bronze to suspend the magnet, considering that the absence of a variable torsion more than compensates for the increased difficulty in handling the more fragile metallic suspension.

Measurement of the Horizontal Component of the Earth's Field.—The method of measuring the horizontal component which is almost exclusively used, both in fixed observatories and in the field, consists in observing the period of a freely suspended magnet, and then obtaining the angle through which an auxiliary suspended magnet is deflected by the magnet used in the first part of the experiment. By the vibration experiment we obtain the value of the product of the magnetic moment (M) of the magnet into the horizontal component (H), while by the deflexion experiment we can deduce the value of the ratio of M to H, and hence the two combined give both M and H.

In the case of the Kew pattern unifilar the same magnet that is used for the declination is usually employed for determining H, and for the purposes of the vibration experiment it is mounted as for the observation of the magnetic meridian. The time of vibration is obtained by means of a chronometer, using the eye-and-ear method. The temperature of the magnet must also be observed, for which purpose a thermometer C (fig. 1) is attached to the box A.

When making the deflection experiment the magnetometer is arranged as shown in fig. 2. The auxiliary magnet has a plane mirror attached, the plane of which is at right angles to the axis of the magnet. An image of the ivory scale B is observed after reflection in the magnet mirror by the telescope A. The magnet K used in the vibration experiment is supported on a carriage L which can slide along the graduated bar D. The axis of the magnet is horizontal and at the same level as the mirror magnet, while when the central division of the scale B appears to coincide with the vertical cross-wire of the telescope the axes of the two magnets are at right angles. During the experiment the mirror magnet is protected from draughts by two wooden doors which slide in grooves. What is known as the method of sines is used, for since the axes of the two magnets are always at right angles when the mirror magnet is in its zero position, the ratio M/H is proportional to the sine of the angle between the magnetic axis of the mirror magnet and the magnetic meridian. When conducting a deflexion experiment the deflecting magnet K is placed with its centre at 30 cm. from the mirror magnet and to the east of the latter, and the whole instrument is turned till the centre division of the scale B coincides with the cross-wire of the telescope, when the readings of the verniers on the azimuth circle are noted. The magnet K is then reversed in the support, and a new setting taken. The difference between the two sets of readings gives twice the angle which the magnetic axis of the mirror magnet makes with the magnetic meridian. In order to eliminate any error due to the zero of the scale D not being exactly below the mirror magnet, the support L is then removed to the west side of the instrument, and the settings are repeated. Further, to allow of a correction being applied for the finite length of the magnets the whole series of settings is repeated with the centre of the deflecting magnet at 40 cm. from the mirror magnet.

Omitting correction terms depending on the temperature and on the inductive effect of the earth's magnetism on the moment of the deflecting magnet, if θ is the angle which the axis of the deflected magnet makes with the meridian when the centre of the deflecting magnet is at a distance r, then

$$\frac{r^3H}{2M}\sin\theta = 1 + \frac{P}{r} + \frac{Q}{r^2} + \&c.,$$

in which P and Q are constants depending on the dimensions and magnetic states of the two magnets. The value of the constants P and Q can be obtained by making deflexion experiments at three distances. It is, however, possible by suitably choosing the proportions of the two magnets to cause either P or Q to be very small. Thus it is usual, if the magnets are of similar shape, to make the deflected magnet 0.467 of the length of the deflecting magnet, in which case Q is negligible, and thus by means of deflexion experiments at two distances the value of P can be obtained. (See C. Börgen, *Terrestrial Magnetism*, 1896, i. p. 176, and C. Chree, *Phil. Mag.*, 1904 [6], 7, p. 113.)

In the case of the vibration experiment correction terms have to be introduced to allow for the temperature of the magnet, for the inductive effect of the earth's field, which slightly increases the magnetic moment of the magnet, and for the torsion of the suspension fibre, as well as the rate of the chronometer. If the temperature of the magnet were always exactly the same in both the vibration and deflexion experiment, then no correction on account of the effect of temperature in the magnetic moment would be necessary in either experiment. The fact that the moment of inertia of the magnet varies with the temperature must, however, be taken into account. In the deflexion experiment, in addition to the induction correction, and that for the effect of temperature on the magnetic moment, a correction has to be applied for the effect of temperature on the length of the bar which supports the deflexion magnet.

See also Stewart and Gee, *Practical Physics*, vol. 2, containing a description of the Kew pattern unifilar magnetometer and detailed instructions for performing the experiments; C. Chree, *Phil. Mag.*, 1901 (6), 2, p. 613, and *Proc. Roy. Soc.*, 1899, 65, p. 375, containing a discussion of the errors to which the Kew unifilar instrument is subject; E. Mascart, *Traité de magnétisme terrestre*, containing a description of the instruments used in the French magnetic survey, which are interesting on account of their small size and consequent easy portability; H. E. D. Fraser, *Terrestrial Magnetism*, 1901, 6, p. 65, containing a description of a modified Kew pattern unifilar as used in the Indian survey; H. Wild, *Mém. Acad. imp. sc. St Pétersbourg*, 1896 (viii.), vol. 3, No. 7, containing a description of a most elaborate unifilar magnetometer with which it is claimed results can be obtained of a very high order of accuracy; K. Haufsmann, *Zeits. für Instrumentenkunde*, 1906, 26, p. 2, containing a description of a magnetometer for field use, designed by M. Eschenhagen, which has many advantages.

Measurements of the Magnetic Elements at Sea.—Owing to the fact that the proportion of the earth's surface covered by sea is so much greater than the dry land, the determination of the magnetic elements on board ship is a matter of very considerable importance. The movements of a ship entirely preclude the employment of any instrument in which a magnet suspended by a fibre has any part, so that the unifilar is unsuited for such observations. In order to obtain the declination a pivoted magnet is used to obtain the magnetic meridian, the geographical meridian being obtained by observations on the sun or stars. A carefully made ship's compass is usually employed, though in some cases the compass card, with its attached magnets, is made reversible, so that the inclination to the zero of the card of the magnetic axis of the system of magnets attached to the card can be eliminated by reversal. In the absence of such a reversible card the index correction must be determined by comparison with a unifilar magnetometer, simultaneous observations being made on shore, and these observations repeated as often as occasion permits. To determine the dip a Fox's dip circle[1] is used. This consists of an ordinary dip circle (see Inclinometer) in which the ends of the axle of the

needle are pointed and rest in jewelled holes, so that the movements of the ship do not displace the needle. The instrument is, of course, supported on a gimballed table, while the ship during the observations is kept on a fixed course. To obtain the *strength* of the field the method usually adopted is that known as Lloyd's method.[2] To carry out a determination of the total force by this method the Fox dip circle has been slightly modified by E. W. Creak, and has been found to give satisfactory results on board ship. The circle is provided with two needles in addition to those used for determining the dip, one (*a*) an ordinary dip needle, and the other (*b*) a needle which has been loaded at one end by means of a small peg which fits into one of two symmetrically placed holes in the needle. The magnetism of these two needles is never reversed, and they are as much as possible protected from shock and from approach to other magnets, so that their magnetic state may remain as constant as possible. Attached to the cross-arm which carries the microscopes used to observe the ends of the dipping needle is a clamp, which will hold the needle *b* in such a way that its plane is parallel to the vertical circle and its axis is at right angles to the line joining the two microscopes. Hence, when the microscopes are adjusted so as to coincide with the points of the dipping needle *a*, the axes of the two needles must be at right angles. The needle *a* being suspended between the jewels, and the needle *b* being held in the clamp, the cross-arm carrying the reading microscopes and the needle *b* is rotated till the ends of the needle a coincide with the cross-wires of the microscopes. The verniers having been read, the cross-arm is rotated so as to deflect the needle *a* in the opposite direction, and a new setting is taken. Half the difference between the two readings gives the angle through which the needle a has been deflected under the action of the needle *b*. This angle depends on the ratio of the magnetic moment of the needle *b* to the total force of the earth's field. It also involves, of course, the distance between the needles and the distribution of the magnetism of the needles; but this factor is determined by comparing the value given by the instrument, at a shore station, with that given by an ordinary magnetometer. Hence the above observation gives us a means of obtaining the *ratio* of the magnetic moment of the needle *b* to the value of the earth's total force. The needle *b* is then substituted for *a*, there being now no needle in the clamp attached to the microscope arm, and the difference between the reading now obtained and the dip, together with the weight added to the needle, gives the product of the moment of the needle *b* into the earth's total force. Hence, from the two observations the value of the earth's total force can be deduced. In an actual observation the deflecting needle would be reversed, as well as the deflected one, while different weights would be used to deflect the needle *b*.

For a description of the method of using the Fox circle for observations at sea consult the *Admiralty Manual of Scientific Inquiry*, p. 116, while a description of the most recent form of the circle, known as the Lloyd-Creak pattern, will be found in *Terrestrial Magnetism*, 1901, 6, p. 119. An attachment to the ordinary ship's compass, by means of which satisfactory measurements of the horizontal component have been made on board ship, is described by L. A. Bauer in *Terrestrial Magnetism*, 1906, 11, p. 78. The principle of the method consists in deflecting the compass needle by means of a horizontal magnet supported vertically over the compass card, the axis of the deflecting magnet being always perpendicular to the axis of the magnet attached to the card. The method is not strictly an absolute one, since it presupposes a knowledge of the magnetic moment of the deflecting magnet. In practice it is found that a magnet can be prepared which, when suitably protected from shock, &c., retains its magnetic moment sufficiently constant to enable observations of H to be made comparable in accuracy with that of the other elements obtained by the instruments ordinarily employed at sea.

(W. Wn.)

1 *Annals of Electricity*, 1839, 3, p. 288.

2 Humphrey Lloyd, *Proc. Roy. Irish Acad.*, 1848, 4, p. 57.

MAGNETO-OPTICS.

The first relation between magnetism and light was discovered by Faraday,[1] who proved that the plane of polarization of a ray of light was rotated when the ray travelled through certain substances parallel to the lines of magnetic force. This power of rotating the plane of polarization in a magnetic field has been shown to be possessed by all refracting substances, whether they are in the solid, liquid or gaseous state. The rotation by gases was established independently by H. Becquerel,[2] and Kundt and Röntgen,[3] while Kundt[4] found that films of the magnetic metals, iron, cobalt, nickel, thin enough to be transparent, produced enormous rotations, these being in iron and cobalt magnetized to saturation at the rate of 200,000° per cm. of thickness, and in nickel about 89,000°. The direction of rotation is not the same in all bodies. If we call the rotation positive when it is related to the direction of the magnetic force, like rotation and translation in a right-handed screw, or, what is equivalent, when it is in the direction of the electric currents which would produce a magnetic field in the same direction as that which produces the rotation, then most substances produce positive rotation. Among those that produce negative rotation are ferrous and ferric salts, ferricyanide of potassium, the salts of lanthanum, cerium and didymium, and chloride of titanium.[5]

The magnetic metals iron, nickel, cobalt, the salts of nickel and cobalt, and oxygen (the most magnetic gas) produce positive rotation.

For slightly magnetizable substances the amount of rotation in a space PQ is proportional to the difference between the magnetic potential at P and Q; or if θ is the rotation in PQ, Ω_P, Ω_Q, the magnetic potential at P and Q, then $\theta = R(\Omega_P - \Omega_Q)$, where R is a constant, called Verdet's constant, which depends upon the refracting substance, the wave length of the light, and the temperature. The following are the values of R (when the rotation is expressed in circular measure) for the D line and a temperature of 18° C.:—

Substance.	$R \times 10^5$.	Observer.
	1.222	Lord Rayleigh[6] and Köpsel.[7]

Carbon bisulphide	1.225	Rodger and Watson.[8]
Water	.377	Arons.[9]
	.3808	Rodger and Watson.[8]
Alcohol	.330	Du Bois.[10]
Ether	.315	Du Bois.[10]
Oxygen (at 1 atmosphere)	.000179	Kundt and Röntgen (*loc. cit.*)
Faraday's heavy glass	1.738	

The variation of Verdet's constant with temperature has been determined for carbon bisulphide and water by Rodger and Watson (*loc. cit.*). They find if R_t, R_0 are the values of Verdet's constant at t°C and 0°C. respectively, then for carbon bisulphide $R_t = R_0 (1 - .0016961)$, and for water $R_t = R_0 (1 - .0000305t - .00000305t^2)$.

For the magnetic metals Kundt found that the rotation did not increase so rapidly as the magnetic force, but that as this force was increased the rotation reached a maximum value. This suggests that the rotation is proportional to the intensity of magnetization, and not to the magnetic force.

The amount of rotation in a given field depends greatly upon the wave length of the light; the shorter the wave length the greater the rotation, the rotation varying a little more rapidly than the inverse square of the wave length. Verdet[11] has compared in the cases of carbon bisulphide and creosote the rotation given by the formula

$$\theta = mc\gamma \frac{c^2}{\lambda^2} \left(c - \lambda \frac{di}{d\lambda} \right)$$

with those actually observed; in this formula θ is the angular rotation of the plane of polarization, m a constant depending on the medium, λ the wave length of the light in air, and i its index of refraction in the medium. Verdet found that, though the agreement is fair, the differences are greater than can be explained by errors of experiment.

Verdet[12] has shown that the rotation of a salt solution is the sum of the rotations due to the salt and the solvent; thus, by mixing a salt which produces negative rotation with water which produces positive rotation, it is possible to get a solution which does not exhibit any rotation. Such solutions are not in general magnetically neutral. By mixing diamagnetic and paramagnetic substances we can get magnetically neutral solutions, which, however, produce a finite rotation of the plane of polarization. The relation of the magnetic rotation to chemical constitution has been studied in great detail by Perkin,[13] Wachsmuth,[14] Jahn[15] and Schönrock.[16]

The rotation of the plane of polarization may conveniently be regarded as denoting that the velocity of propagation of circular-polarized light travelling along the lines of magnetic force depends upon the direction of rotation of the ray, the velocity when the rotation is related to the direction of the magnetic force, like rotation and translation on a right-handed screw being different from that for a left-handed rotation. A plane-polarized ray may be regarded as compounded of two oppositely circularly-polarized rays, and as these travel along the lines of magnetic force with different velocities, the one will gain or lose in phase on the other, so that when they are again compounded they will correspond to a plane-polarized ray, but in consequence of the change of phase the plane of polarization will not coincide with its original position.

Reflection from a Magnet.—Kerr[17] in 1877 found that when plane-polarized light is incident on the pole of an electromagnet, polished so as to act like a mirror, the plane of polarization of the reflected light is rotated by the magnet. Further experiments on this phenomenon have been made by Righi,[18] Kundt,[19] Du Bois,[20] Sissingh,[21] Hall,[22] Hurion,[23] Kaz[24] and Zeeman.[25] The simplest case is when the incident plane-polarized light falls normally on the pole of an electromagnet. When the magnet is not excited the reflected ray is plane-polarized; when the magnet is excited the plane of polarization is rotated through a small angle, the direction of rotation being opposite to that of the currents exciting the pole. Righi found that the reflected light was slightly elliptically polarized, the axes of the ellipse being of very unequal magnitude. A piece of gold-leaf placed over the pole entirely stops the rotation, showing that it is not produced in the air near the pole. Rotation takes place from magnetized nickel and cobalt as well as from iron, and is in the same direction (Hall). Righi has shown that the rotation at reflection is greater for long waves than for short, whereas, as we have seen, the Faraday rotation is greater for short waves than for long. The rotation for different coloured light from iron, nickel, cobalt and magnetite has been measured by Du Bois; in magnetite the direction of rotation is opposite to that of the other metals. When the light is incident obliquely and not normally on the polished pole of an electromagnet, it is elliptically polarized after reflection, even when the plane of polarization is parallel or at right angles to the plane of incidence. According to Righi, the amount of rotation when the plane of polarization of the incident light is perpendicular to the plane of incidence reaches a maximum when the angle of incidence is between 44° and 68°, while when the light is polarized in the plane of incidence the rotation steadily decreases as the angle of incidence is increased. The rotation when the light is polarized in the plane of incidence is always less than when it is polarized at right angles to that plane, except when the incidence is normal, when the two rotations are of course equal.

Reflection from Tangentially Magnetized Iron.—In this case Kerr[26] found: (1) When the plane of incidence is perpendicular to the lines of magnetic force, no rotation of the reflected light is produced by magnetization; (2) no rotation is produced when the light is incident normally; (3) when the incidence is oblique, the lines of magnetic force being in the plane of incidence, the reflected light is elliptically polarized after reflection, and the axes of the ellipse are not in and at right angles to the plane of incidence. When the light is polarized in the plane of incidence, the rotation is at all angles of incidence in the opposite direction to that of the currents which would produce a magnetic field of the same sign as the magnet. When the light is polarized at right angles to the plane of incidence, the rotation is in the same direction as these currents when the angle of incidence is between 0° and 75° according to Kerr, between 0° and 80° according to Kundt, and between 0° and 78° 54′ according to Righi. When the incidence is more oblique than this, the rotation of the plane of polarization is in the opposite direction to the electric currents which would produce a magnetic field of the

same sign.

The theory of the phenomena just described has been dealt with by Airy,[27] C. Neumann,[28] Maxwell,[29] Fitzgerald,[30] Rowland,[31] H. A. Lorentz,[32] Voight,[33] Ketteler,[34] van Loghem,[35] Potier,[36] Basset,[37] Goldhammer,[38] Drude,[39] J. J. Thomson,[40] and Leatham;[41] for a critical discussion of many of these theories we refer the reader to Larmor's[42] British Association Report. Most of these theories have proceeded on the plan of adding to the expression for the electromotive force terms indicating a force similar in character to that discovered by Hall (see Magnetism) in metallic conductors carrying a current in a magnetic field, *i.e.* an electromotive force at right angles to the plane containing the magnetic force and the electric current, and proportional to the sine of the angle between these vectors. The introduction of a term of this kind gives rotation of the plane of polarization by transmission through all refracting substance, and by reflection from magnetized metals, and shows a fair agreement between the theoretical and experimental results. The simplest way of treating the questions seems, however, to be to go to the equations which represent the propagation of a wave travelling through a medium containing ions. A moving ion in a magnetic field will be acted upon by a mechanical force which is at right angles to its direction of motion, and also to the magnetic force, and is equal per unit charge to the product of these two vectors and the sine of the angle between them. For the sake of brevity we will take the special case of a wave travelling parallel to the magnetic force in the direction of the axis of *z*.

Then supposing that all the ions are of the same kind, and that there are n of these each with mass m and charge e per unit volume, the equations representing the field are (see Electric Waves):—

$$K_0 \frac{dX_0}{dt} + 4\pi ne \frac{d\xi}{dt} = \frac{d\beta}{dz};$$

$$\frac{dX_0}{dz} = \frac{d\beta}{dt};$$

$$K_0 \frac{dY_0}{dt} + 4\pi ne \frac{d\eta}{dt} = -\frac{d\alpha}{dz}$$

$$\frac{dY_0}{dz} = -\frac{d\alpha}{dt};$$

$$m \frac{d^2\xi}{dt^2} + R_1 \frac{d\xi}{dt} + a\xi = \left(X_0 + \frac{4\pi}{3} ne\xi \right) e + He \frac{d\eta}{dt}$$

$$m \frac{d^2\eta}{dt^2} + R_1 \frac{d\eta}{dt} + a\eta = \left(Y_0 + \frac{4\pi}{3} ne\eta \right) e - He \frac{d\xi}{dt};$$

where H is the external magnetic field, X_0, Y_0 the components of the part of the electric force in the wave not due to the charges on the atoms, α and β the components of the magnetic force, ξ and η the co-ordinates of an ion, R_1 the coefficient of resistance to the motion of the ions, and α the force at unit distance tending to bring the ion back to its position of equilibrium, K_0 the specific inductive capacity of a vacuum. If the variables are proportional to $\varepsilon^{l(pt-qz)}$ we find by substitution that q is given by the equation

$$q^2 - K_0 p^2 - \frac{4\pi ne^2 p^2 P}{P^2 - H^2 e^2 p^2} = \pm \frac{4\pi ne^3 Hp^3}{P^2 - H^2 e^2 p^2},$$

where

$$P = (a - \tfrac{4}{3}\pi ne^2) + R_1 \iota p - mp^2,$$

or, by neglecting R, $P = m(s^2 - p^2)$, where s is the period of the free ions. If, q_1^2, q_2^2 are the roots of this equation, then corresponding to q_1 we have $X_0 = \iota Y_0$ and to q_2 $X_0 = -\iota Y_0$. We thus get two oppositely circular-polarized rays travelling with the velocities p/q_1 and p/q_2 respectively. Hence if v_1, v_2 are these velocities, and v the velocity when there is no magnetic field, we obtain, if we neglect terms in H^2,

$$\frac{1}{v_1^2} = \frac{1}{v^2} + \frac{4\pi ne^3 Hp}{m^2 (s^2 - p^2)^2},$$

$$\frac{1}{v_2^2} = \frac{1}{v^2} - \frac{4\pi ne^3 Hp}{m^2 (s^2 - p^2)^2}.$$

The rotation r of the plane of polarization per unit length

$$= \tfrac{1}{2} p \left(\frac{1}{v_1} - \frac{1}{v_2} \right) = \frac{2\pi ne^3 Hp^2 v}{m^2 (s^2 - p^2)^2}.$$

Since $1/v^2 = K_0 + 4\pi ne^2/m(s^2 - p^2)$, we have if μ is the refractive index for light of frequency p, and v_0 the velocity of light in vacuo.

$$\mu^2 - 1 = 4\pi ne^2 v_0^2 / m(s^2 - p^2). \tag{1}$$

So that we may put

$$r = (\mu^2 - 1)^2 p^2 H / s\pi\mu ne v_0^3. \tag{2}$$

Becquerel (*Comptes rendus*, 125, p. 683) gives for r the expression

$$\tfrac{1}{2} \frac{e}{m} \frac{H}{v_0} \frac{d\mu}{d\lambda},$$

where λ is the wave length. This is equivalent to (2) if μ is given by (1). He has shown that this expression is in good agreement with experiment. The sign of r depends on the sign of e, hence the rotation due to negative ions would be opposite to that for positive. For the great majority of substances the direction of rotation is that corresponding to the negation ion. We see from the equations that the rotation is very large for such a value of p as makes $P = 0$; this value corresponds to a free period of the ions, so that the rotation ought to be very large in the neighbourhood of an absorption band. This has been verified for sodium vapour by Macaluso and Corbino.[43]

If plane-polarized light falls normally on a plane face of the medium containing the ions, then if the electric force in the incident wave is parallel to x and is equal to the real part of $A\epsilon^{\iota(pt-qz)}$, if the reflected beam in which the electric force is parallel to x is represented by $B\epsilon^{\iota(pt+qz)}$ and the reflected beam in which the electric force is parallel to the axis of y by $C\epsilon^{\iota(pt+qz)}$, then the conditions that the magnetic force parallel to the surface is continuous, and that the electric forces parallel to the surface in the air are continuous with Y_0, X_0 in the medium, give

$$\frac{A}{(q+q_1)(q+q_2)} = \frac{B}{(q^2-q_1q_2)} = \frac{\iota C}{q(q_2-q_1)}$$

or approximately, since q_1 and q_2 are nearly equal,

$$\frac{\iota C}{B} = \frac{q(q_2-q_1)}{q^2-{q_1}^2} = \frac{(\mu^2-1)\,pH}{4\pi\mu neV_0{}^2}.$$

Thus in transparent bodies for which μ is real, C and B differ in phase by $\pi/2$, and the reflected light is elliptically polarized, the major axis of the ellipse being in the plane of polarization of the incident light, so that in this case there is no rotation, but only elliptic polarization; when there is strong absorption so that μ contains an imaginary term, C/B will contain a real part so that the reflected light will be elliptically polarized, but the major axis is no longer in the plane of polarization of the incident light; we should thus have a rotation of the plane of polarization superposed on the elliptic polarization.

Zeeman's Effect.—Faraday, after discovering the effect of a magnetic field on the plane of polarization of light, made numerous experiments to see if such a field influenced the nature of the light emitted by a luminous body, but without success. In 1885 Fievez,[44] a Belgian physicist, noticed that the spectrum of a sodium flame was changed slightly in appearance by a magnetic field; but his observation does not seem to have attracted much attention, and was probably ascribed to secondary effects. In 1896 Zeeman[45] saw a distinct broadening of the lines of lithium and sodium when the flames containing salts of these metals were between the poles of a powerful electromagnet; following up this observation, he obtained some exceedingly remarkable and interesting results, of which those observed with the blue-green cadmium line may be taken as typical. He found that in a strong magnetic field, when the lines of force are parallel to the direction of propagation of the light, the line is split up into a doublet, the constituents of which are on opposite sides of the undisturbed position of the line, and that the light in the constituents of this doublet is circularly polarized, the rotation in the two lines being in opposite directions. When the magnetic force is at right angles to the direction of propagation of the light, the line is resolved into a triplet, of which the middle line occupies the same position as the undisturbed line; all the constituents of this triplet are plane-polarized, the plane of polarization of the middle line being at right angles to the magnetic force, while the outside lines are polarized on a plane parallel to the lines of magnetic force. A great deal of light is thrown on this phenomenon by the following considerations due to H. A. Lorentz.[46]

Let us consider an ion attracted to a centre of force by a force proportional to the distance, and acted on by a magnetic force parallel to the axis of z: then if m is the mass of the particle and e its charge, the equations of motion are

$$m\frac{d^2x}{dt^2} + \alpha x = -He\frac{dy}{dt};$$
$$m\frac{d^2y}{dt^2} + \alpha y = He\frac{dx}{dt};$$
$$m\frac{d^2z}{dt^2} + ax = 0.$$

The solution of these equations is

$$x = A\cos(p_1t+\beta) + B\cos(p_2t+\beta_1)$$
$$y = A\sin(p_1t+\beta) - B\sin(p_2t+\beta_1)$$
$$z = C\cos(pt+\gamma)$$

where

$$\alpha - mp_1{}^2 = -Hep_1$$
$$\alpha - mp_2{}^2 = Hep_2$$

$$p^2 = \alpha/m,$$

or approximately

$$p_1 = p + \tfrac{1}{2}\frac{He}{m}, \qquad p_2 = p - \tfrac{1}{2}\frac{He}{m}.$$

Thus the motion of the ion on the xy plane may be regarded as made up of two circular motions in opposite directions described with frequencies p_1 and p_2 respectively, while the motion along z has the period p, which is the frequency for all the vibrations when H = 0. Now suppose that the cadmium line is due to the motion of such an ion; then if the magnetic force is along the direction of propagation, the vibration in this direction has its period unaltered, but since the direction of vibration is perpendicular to the wave front, it does not give rise to light. Thus we are left with the two circular motions in the wave front with frequencies p_1 and p_2 giving the circularly polarized constituents of the doublet. Now suppose the magnetic force is at right angles to the direction of propagation of the light; then the vibration parallel to the magnetic force being in the wave front produces luminous effects and gives rise to a plane-polarized ray of undisturbed period (the middle line of the triplet), the plane of polarization being at right angles to the magnetic force. The components in the wave-front of the circular orbits at right angles to the magnetic force will be rectilinear motions of frequency p_1 and p_2 at right angles to the magnetic force—so that they will produce plane-polarized light, the plane of polarization being parallel to the magnetic force; these are the outer lines of the triplet.

If Zeeman's observations are interpreted from this point of view, the directions of rotation of the circularly-polarized light in the doublet observed along the lines of magnetic force show that the ions which produce the luminous vibrations are *negatively* electrified, while the measurement of the charge of frequency due to the magnetic field shows that e/m is of the order 10^7. This result is of great interest, as this is the order of the value of e/m in the negatively electrified particles which constitute the Cathode Rays (see Conduction, Electric III. *Through Gases*). Thus we infer that the "cathode particles" are found in bodies, even where not subject to the action of intense electrical fields, and are in fact an ordinary constituent of the molecule. Similar particles are found near an incandescent wire, and also near a metal plate illuminated by ultra-violet light. The value of e/m deduced from the Zeeman effect ranges from 10^7 to 3.4×10^7, the value of e/m for the particle in the cathode rays is 1.7×10^7. The majority of the determinations of e/m from the Zeeman effect give numbers larger than this, the maximum being about twice this value.

A more extended study of the behaviour of the spectroscopic lines has afforded examples in which the effects produced by a magnet are more complicated than those we have described, indeed the simple cases are much less numerous than the more complex. Thus Preston[47] and Cornu[48] have shown that under the action of a transverse magnetic field one of the D lines splits up into four, and the other into six lines; Preston has given many other examples of these quartets and sextets, and has shown that the change in the frequency, which, according to the simple theory indicated, should be the same for all lines, actually varies considerably from one line to another, many lines showing no appreciable displacement. The splitting up of a single line into a quartet or sextet indicates, from the point of view of the ion theory, that the line must have its origin in a system consisting of more than one ion. A single ion having only three degrees of freedom can only have three periods. When there is no magnetic force acting on the ion these periods are equal, but though under the action of a magnetic force they are separated, their number cannot be increased. When therefore we get four or more lines, the inference is that the system giving the lines must have at least four degrees of freedom, and therefore must consist of more than one ion. The theory of a system of ions mutually influencing each other shows, as we should expect, that the effects are more complex than in the case of a single ion, and that the change in the frequency is not necessarily the same for all systems (see J. J. Thomson, *Proc. Camb. Phil. Soc.* 13, p. 39). Preston[49] and Runge and Paschen have proved that, in some cases at any rate, the change in the frequency of the different lines is of such a character that they can be grouped into series such that each line in the series has the same change in frequency for the same magnetic force, and, moreover, that homologous lines in the spectra of different metals belonging to the same group have the same change in frequency.

A very remarkable case of the Zeeman effect has been discovered by H. Becquerel and Deslandres (*Comptes rendus*, 127, p. 18). They found lines in iron when the most deflected components are those polarized in the plane at right angles to the magnetic force. On the simple theory the light polarized in this way is not affected. Thus the behaviour of the spectrum in the magnetic field promises to throw great light on the nature of radiation, and perhaps on the constitution of the elements. The study of these effects has been greatly facilitated by the invention by Michelson[50] of the echelon spectroscope.

There are some interesting phenomena connected with the Zeeman effect which are more easily observed than the effect itself. Thus Cotton[51] found that if we have two Bunsen flames, A and B, coloured by the same salt, the absorption of the light of one by the other is diminished if either is placed between the poles of a magnet: this is at once explained by the Zeeman effect, for the times of vibration of the molecules of the flame in the magnetic field are not the same as those of the other flame, and thus the absorption is diminished. Similar considerations explain the phenomenon observed by Egoroff and Georgiewsky,[52] that the light emitted from a flame in a transverse field is partially polarized in a plane parallel to the magnetic force; and also Righi's[53] observation that if a sodium flame is placed in a longitudinal field between two crossed Nicols, and a ray of white light sent through one of the Nicols, then through the flame, and then through the second Nicol, the amount of light passing through the second Nicol is greater when the field is on than when it is off. Voight and Wiechert (*Wied. Ann.* 67, p. 345) detected the double refraction produced when light travels through a substance exposed to a magnetic field at right angles to the path of the light; this result had been predicted by Voight from theoretical considerations. Jean Becquerel has made some very interesting experiments on the effect of a magnetic field on the fine absorption bands produced by xenotime, a phosphate of yttrium and erbium, and tysonite, a fluoride of cerium, lanthanum and didymium, and has obtained effects which he ascribes to the presence of positive electrons. A very complete account of magneto- and electro-optics is contained in Voight's *Magneto- and Elektro-optik*.

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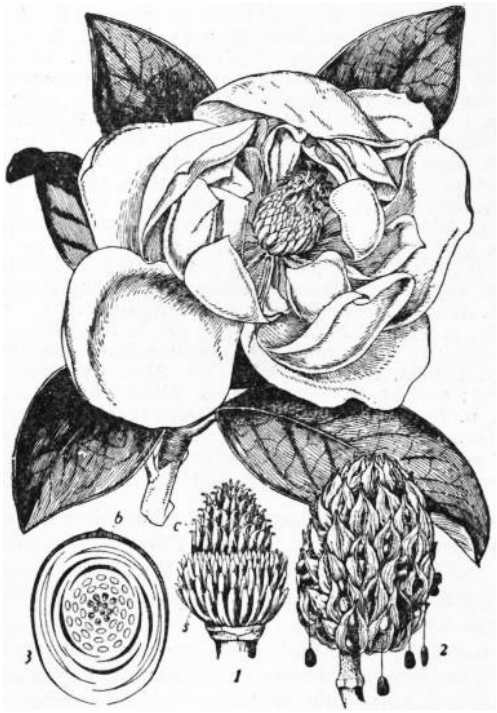
(J. J. T.)

MAGNOLIA, the typical genus of the botanical order Magnoliaceae, named after Pierre Magnol (1638-1715), professor of medicine and botany at Montpellier. It contains about twenty species, distributed in Japan, China and the Himalayas, as well as in North America.

Magnolias are trees or shrubs with deciduous or rarely evergreen foliage. They bear conspicuous and often large, fragrant, white, rose or purple flowers. The sepals are three in number, the petals six to twelve, in two to four series of three in each, the stamens and carpels being numerous. The fruit consists of a number of follicles which are borne on a more or less conical receptacle, and dehisce along the outer edge to allow the scarlet or brown seeds to escape; the seeds however remain suspended by a long slender thread (the funicle). Of the old-world species, the earliest in cultivation appears to have been *M. Yulan* (or *M. conspicua*) of China, of which the buds were preserved, as well as used medicinally and to season rice; together with the greenhouse species, *M. fuscata*, it was transported to Europe in 1789, and thence to North America, and is now cultivated in the Middle States. There are many fine forms of *M. conspicua*, the best being *Soulangeana*,

white tinted with purple, *Lenné* and *stricta*. Of the Japanese magnolias, *M. Kobus* and the purple-flowered *M. obovata* were met with by Kaempfer in 1690, and were introduced into England in 1709 and 1804 respectively. *M. pumila*, the dwarf magnolia, from the mountains of Amboyna, is nearly evergreen, and bears deliciously scented flowers; it was introduced in 1786. The Indian species are three in number, *M. globosa*, allied to *M. conspicua* of Japan, *M. sphenocarpa*, and, the most magnificent of all magnolias, *M. Campbellii*, which forms a conspicuous feature in the scenery and vegetation of Darjeeling. It was discovered by Dr Griffith in Bhutan, and is a large forest tree, abounding on the outer ranges of Sikkim, 80 to 150 ft. high, and from 6 to 12 ft. in girth. The flowers are 6 to 10 in. across, appearing before the leaves, and vary from white to a deep rose colour.



Magnolia grandiflora, shoot with flower; rather less than ½ nat. size.

1. Flower after removal of the sepals and petals, showing the indefinite stamens, *s*, and carpels, *c*.
2. Fruit—the ripe carpels are splitting, exposing the seeds, some of which are suspended by the long funicle.
3. Floral diagram, *b*, bract.

The first of the American species brought to Europe (in 1688 by John Banister) was *M. glauca*, a beautiful evergreen species about 15 ft. high with obtuse leathery leaves, blue-green above, silvery underneath, and globular flowers varying from creamy white to pale yellow with age. It is found in low situations near the sea from Massachusetts to Louisiana—more especially in New Jersey and the Carolinas. *M. acuminata*, the so-called “cucumber tree,” from the resemblance of the young fruits to small cucumbers, ranges from Pennsylvania to Carolina. The wood is yellow, and used for bowls; the flowers, 3 to 4 in. across, are glaucous green tinted with yellow. It was introduced into England from Virginia about 1736. *M. tripetala* (or *M. umbrella*), is known as the “umbrella tree” from the arrangement of the leaves at the ends of the branches resembling somewhat that of the ribs of an umbrella. The flowers, 5 to 8 in. across, are white and have a strong but not disagreeable scent. It was brought to England in 1752. *M. Fraseri* (or *M. auriculata*), discovered by John Bartram in 1773, is a native of the western parts of the Carolinas and Georgia, extending southward to western Florida and southern Alabama. It grows 30 to 50 ft. high, has leaves a foot or more long, heart-shaped and bluntly auricled at the base, and fragrant pale yellowish-white flowers, 3 to 4 in. across. The most beautiful species of North America is *M. grandiflora*, the “laurel magnolia,” a native of the south-eastern States, and introduced into England in 1734. It grows a straight trunk, 2 ft. in diameter and upwards of 70 ft. high, bearing a profusion of large, powerfully lemon-scented creamy-white flowers. It is an evergreen tree, easily recognized by its glossy green oval oblong leaves with a rusty-brown under surface. In England it is customary to train it against a wall in the colder parts, but it does well as a bush tree; and the original species is surpassed by the Exmouth varieties, which originated as seedlings at Exeter from the tree first raised in England by Sir John Colliton, and which flower much more freely than the parent plant. Other fine magnolias now to be met with in gardens are *M. cordata*, a North American deciduous tree 40 to 50 ft. high, with heart-shaped leaves, woolly beneath, and yellow flowers lined with purple; *M. hypoleuca*, a fine Japanese tree 60 ft. high or more, with leaves a foot or more long, 6 to 7 in. broad, the under surface covered with hairs; *M. macrophylla*, a handsome deciduous North American tree, with smooth whitish bark, and very large beautiful green leaves, 1 to 3 ft. long, 8 to 10 in. broad, oblong-obovate and heart-shaped at the base; the open sweet-scented bell-shaped flowers 8 to 10 in. across, are white with a purple blotch at the base of the petals; *M. stellata* or *Halleana*, a charming deciduous Japanese shrub remarkable for producing its pure white starry flowers as early as February and March on the leafless stems; and *M. Watsoni*, another fine deciduous Japanese bush or small tree with very fragrant pure white flowers 5 to 6 in. across.

The tulip tree, *Liriodendron tulipifera*, a native of North America, frequently cultivated in England, is also a member of the same family. It reaches a height of over 100 ft. in a native condition, and as much as 60 to 80 ft. in England. It resembles the plane tree somewhat in appearance, but is readily recognized by lobed leaves having the apical lobe truncated, and by its soft green and yellow tulip-like flowers—which however are rarely borne on trees under twenty years of age.

For a description of the principal species of magnolia under cultivation see J. Weathers, *Practical Guide to Garden Plants*, pp. 174 seq., and for a detailed account of the American species see C. S. Sargent, *Silva of North America*, vol. i.

MAGNUS, HEINRICH GUSTAV (1802-1870), German chemist and physicist, was born at Berlin on the 2nd of May 1802. His father was a wealthy merchant; and of his five brothers one, Eduard (1799-1872), became a celebrated painter. After studying at Berlin, he went to Stockholm to work under Berzelius, and later to Paris, where he studied for a while under Gay-Lussac and Thénard. In 1831 he returned to Berlin as lecturer on technology and physics at the university. As a teacher his success was rapid and extraordinary. His lucid style and the perfection of his experimental demonstrations drew to his lectures a crowd of enthusiastic scholars, on whom he impressed the importance of applied science by conducting them round the factories and workshops of the city; and he further found time to hold weekly "colloquies" on physical questions at his house with a small circle of young students. From 1827 to 1833 he was occupied mainly with chemical researches, which resulted in the discovery of the first of the platino-ammonium compounds ("Magnus's green salt" is $PtCl_2$, $2NH_3$), of sulphovinic, ethionic and isethionic acids and their salts, and, in conjunction with C. F. Ammermüller, of periodic acid. Among other subjects at which he subsequently worked were the absorption of gases in blood (1837-1845), the expansion of gases by heat (1841-1844), the vapour pressures of water and various solutions (1844-1854), thermo-electricity (1851), electrolysis (1856), induction of currents (1858-1861), conduction of heat in gases (1860), and polarization of heat (1866-1868). From 1861 onwards he devoted much attention to the question of diathermancy in gases and vapours, especially to the behaviour in this respect of dry and moist air, and to the thermal effects produced by the condensation of moisture on solid surfaces.

In 1834 Magnus was elected extraordinary, and in 1845 ordinary professor at Berlin. He was three times elected dean of the faculty, in 1847, 1858 and 1863; and in 1861, rector magnificus. His great reputation led to his being entrusted by the government with several missions; in 1865 he represented Prussia in the conference called at Frankfort to introduce a uniform metric system of weights and measures into Germany. For forty-five years his labour was incessant; his first memoir was published in 1825 when he was yet a student; his last appeared shortly after his death on the 4th of April 1870. He married in 1840 Bertha Humblot, of a French Huguenot family settled in Berlin, by whom he left a son and two daughters.

See *Allgemeine deutsche Biog.* The Royal Society's *Catalogue* enumerates 84 papers by Magnus, most of which originally appeared in *Poggendorff's Annalen*.

MAGNY, CLAUDE DRIGON, Marquis de (1797-1879), French heraldic writer, was born in Paris. After being employed for some time in the postal service, he devoted himself to the study of heraldry and genealogy, his work in this direction being rewarded by Pope Gregory XVI. with a marquisate. He founded a French college of heraldry, and wrote several works on heraldry and genealogy, of which the most important were *Archives nobiliaires universelles* (1843) and *Livre d'or de la noblesse de France* (1844-1852). His two sons, Edouard Drigon and Achille Ludovice Drigon, respectively comte and vicomte de Magny, also wrote several works on heraldry.

MAGO, the name of several Carthaginians, (1) The reputed founder of the military power of Carthage, fl. 550-500 B.C. (Justin xviii. 7, xix. i). (2) The youngest of the three sons of Hamilcar Barca. He accompanied Hannibal into Italy, and held important commands in the great victories of the first three years. After the battle of Cannae (216 B.C.) he sailed to Carthage to report the successes gained. He was about to return to Italy with strong reinforcements for Hannibal, when the government ordered him to go to the aid of his other brother, Hasdrubal, who was hard pressed in Spain. He carried on the war there with varying success in concert with the two Hasdrubals until, in 209, his brother marched into Italy to help Hannibal. Mago remained in Spain with Hasdrubal, the son of Gisco. In 207 he was defeated by M. Junius Silanus, and in 206 the combined forces of Mago and Hasdrubal were scattered by Scipio Africanus in the decisive battle of Silpia. Mago maintained himself for some time in Gades, but afterwards received orders to carry the war into Liguria. He wintered in the Balearic Isles, where the harbour Portus Magonis (Port Mahon) still bears his name. Early in 204 he landed in Liguria, where he maintained a desultory warfare till in 203 he was defeated in Cisalpine Gaul by the Roman forces. Shortly afterwards he was ordered to return to Carthage, but on the voyage home he died of wounds received in battle.

See Polybius iii.; Livy xxi.-xxiii.; xxviii., chs. 23-37; xxix., xxx.; Appian, *Hispanica*, 25-37; T. Friedrich,

Biographie des Barkiden Mago; H. Lehmann, *Der Angriff der drei Barkiden auf Italien* (Leipzig, 1905); and further J. P. Mahaffy, in *Hermathena*, vii. 29-36 (1890).

(3) The name of Mago is also attached to a great work on agriculture which was brought to Rome and translated by order of the senate after the destruction of Carthage. The book was regarded as a standard authority, and is often referred to by later writers.

See Pliny, *Nat. Hist*, xviii. 5; Columella, i. 1; Cicero, *De oratore*, i. 58.

MAGPIE, or simply Pie (Fr. *pie*), the prefix being the abbreviated form of a human name (Margaret[1]), a bird once common throughout Great Britain, though now nearly everywhere scarce. Its pilfering habits have led to this result, yet the injuries it causes are exaggerated by common report; and in many countries of Europe it is still the tolerated or even the cherished neighbour of every farmer, as it formerly was in England if not in Scotland also. It did not exist in Ireland in 1617, when Fynes Morison wrote his *Itinerary*, but it had appeared there within a hundred years later, when Swift mentions its occurrences in his *Journal to Stella*, 9th July 1711. It is now common enough in that country, and there is a widespread but unfounded belief that it was introduced by the English out of spite. It is a species that when not molested is extending its range, as J. Wolley ascertained in Lapland, where within the last century it has been gradually pushing its way along the coast and into the interior from one fishing-station or settler's house to the next, as the country has been peopled.

Since the persecution to which the pie has been subjected in Great Britain, its habits have altered greatly. It is no longer the merry, saucy hanger-on of the homestead, but is become the suspicious thief, shunning the gaze of man, and knowing that danger may lurk in every bush. Hence opportunities of observing it fall to the lot of few, and most persons know it only as a curtailed captive in a wicker cage, where its vivacity and natural beauty are lessened or wholly lost. At large few European birds possess greater beauty, the pure white of its scapulars and inner web of the flight-feathers contrasting vividly with the deep glossy black on the rest of its body and wings, while its long tail is lustrous with green, bronze, and purple reflections. The pie's nest is a wonderfully ingenious structure, placed either in high trees or low bushes, and so massively built that it will stand for years. Its foundation consists of stout sticks, turf and clay, wrought into a deep, hollow cup, plastered with earth, and lined with fibres; but around this is erected a firmly interwoven, basket-like outwork of thorny sticks, forming a dome over the nest, and leaving but a single hole in the side for entrance and exit, so that the whole structure is rendered almost impregnable. Herein are laid from six to nine eggs, of a pale bluish-green freckled with brown and blotched with ash-colour. Superstition as to the appearance of the pie still survives even among many educated persons, and there are several versions of a rhyming adage as to the various turns of luck which its presenting itself, either alone or in company with others, is supposed to betoken, though all agree that the sight of a single pie presages sorrow.

The pie belongs to the same family of birds as the crow, and is the *Corvus pica* of Linnaeus, the *Pica caudata*, *P. melanoleuca*, or *P. rustica* of modern ornithologists, who have recognized it as forming a distinct genus, but the number of species thereto belonging has been a fruitful source of discussion. Examples from the south of Spain differ slightly from those inhabiting the rest of Europe, and in some points more resemble the *P. mauritanica* of north-western Africa; but that species has a patch of bare skin of a fine blue colour behind the eye, and much shorter wings. No fewer than five species have been discriminated from various parts of Asia, extending to Japan; but only one of them, the *P. leucoptera* of Turkestan and Tibet, has of late been admitted as valid. In the west of North America, and in some of its islands, a pie is found which extends to the upper valleys of the Missouri and the Yellowstone, and has long been thought entitled to specific distinction as *P. hudsonia*; but its claim thereto is now disallowed by some of the best ornithologists of the United States, and it can hardly be deemed even a geographical variety of the Old-World form. In California, however, there is a permanent race if not a good species, *P. nuttalli*, easily distinguishable by its yellow bill and the bare yellow skin round its eyes; on two occasions in the year 1867 a bird apparently similar was observed in Great Britain (*Zoologist*, ser. 2, pp. 706, 1016).

(A. N.)

1 "Magot" and "Madge," with the same origin, are names, frequently given in England to the pie; while in France it is commonly known as *Margot*, if not termed, as it is in some districts, *Jaquette*.

MAGWE, a district in the Minbu division of Upper Burma. Area, 2913 sq. m.; pop. (1901), 246,708, showing an increase of 12.38% in the decade. Magwe may be divided into two portions: the low, flat country in the Taungdwingyi subdivision, and the undulating high ground extending over the rest of the district. In Taungdwingyi the soil is rich, loamy, and extremely fertile. The plain is about 45 m. from north to south. At its southern extremity it is about 30 m. wide, and lessens in width to the north till it ends in a point at Natmauk. On the east are the Pegu Yomas, which at some points reach a height of 1500 ft. A number of streams run westwards to the Irrawaddy, of which the Yin and the Pin, which form the northern boundary, are the chief. The only perennial stream is the Yanpè. Rice is the staple product, and considerable quantities are exported.

Sesamum of very high quality, maize, and millet are also cultivated, as well as cotton in patches here and there over the whole district.

In this district are included the well-known Yenangyaung petroleum wells. The state wells have been leased to the Burma Oil Company. The amount of oil-bearing lands is estimated at 80 sq. m. and the portion not leased to the company has been demarcated into blocks of 1 sq. m. and offered on lease. The remaining land belongs to hereditary Burmese owners called *twinsa*, who dig wells and extract their oil by the rope and pulley system as they have always done. Lacquered wood trays, bowls and platters, and cart-wheels, are the only manufactures of any note in the district.

The annual rainfall averages about 27 inches. The maximum temperature rises to a little over 100° in the hot season, and falls to an average minimum of 53° and 54° in the cold season.

The town of Magwe is the headquarters of the district; pop. (1901), 6232. It is diagonally opposite Minbu, the headquarters of the division, on the right bank of the Irrawaddy.

MAGYARS, the name of the dominant race in Hungary, or Hungarians proper. Though they have become physically assimilated to the western peoples, they belong in origin and language to the Finno-Ugrian (*q.v.*) division of the Ural-Altaic race. They form barely half of the population of Hungary, but are by far the largest and most compact of all its racial groups. Magyar is the official language of Hungary, the official name of which (*Magyarország*, or "country of the Magyars") enshrines the Magyar claim to predominance. While all Magyars are properly Hungarians, all Hungarians are not necessarily Magyars. "Hungarian" may be used as a generic term covering all the various races of Hungary, while "Magyar" is strictly specific to a single group. The Magyars themselves, indeed, sometimes apply the name *Magyarország* to Hungary "proper," excluding Croatia-Slavonia, the whole kingdom being called *Magyarbirodalom*, the Magyar monarchy or realm. See HUNGARY.

MAHABALESHWAR, or MALCOLMPETH, a hill station in Satara district, and the principal sanatorium in the Bombay presidency, India. Pop. (1901), 5299. It is reached by carriage from Wathar railway station (39 m.) or by motor car from Poona (119 m.). Mahabaleshwar occupies the summit of a ridge of the Western Ghats, with a general elevation of 4500 ft. above sea-level. It was established in 1828 by Sir John Malcolm, governor of Bombay, who obtained the site from the raja of Satara in exchange for another patch of territory. The superior elevation of Mahabaleshwar renders it much cooler than Matheran (2460 ft.), a sanatorium about 50 m. E. of Bombay, but its heavy rainfall (292 in. annual average) makes it almost uninhabitable during the rainy season. The mean annual temperature is 67° F. In the hottest season (March-April) an extreme of a little over 90° is reached during the day. Mahabaleshwar forms the retreat usually during spring, and occasionally in autumn, of the governor of Bombay, and the chief officers of his establishment, and has the usual public buildings of a first-class sanatorium.

MAHAFFY, JOHN PENTLAND (1839-), Irish classical scholar, was born in Switzerland on the 12th of July 1839. He received his early education in Switzerland and Germany, and later at Trinity College, Dublin, where he held the professorship of ancient history. Mahaffy, a man of great versatility, published numerous works, some of which, especially those dealing with what may be called the Silver age of Greece, became standard authorities. The following deserve mention: *History of Classical Greek Literature* (4th ed., 1903 seq.); *Social Life in Greece from Homer to Menander* (4th ed., 1903); *The Silver Age of the Greek World* (1906); *The Empire of the Ptolemies* (1896); *Greek Life and Thought from Alexander to the Roman Conquest* (2nd ed., 1896); *The Greek World under Roman Sway from Polybius to Plutarch* (1890). His translation of Kuno Fischer's *Commentary on Kant* (1866) and his own exhaustive analysis, with elucidations, of Kant's critical philosophy are of great value. He also edited the Petrie papyri in the *Cunningham Memoirs* (3 vols. 1891-1905).

MAHALLAT, a province of central Persia, situated between Kashan and Irak. Pop. about 20,000; yearly revenue about £2500. Until 1890 it was one of the five “central provinces” (the other four being Irak, Ferahan, Kezzaz, and Savah), which were under a governor appointed by the shah; since then it has formed part of the Isfahan government. It is traversed by the Anarbar or Kum River, and comprises the city of Mahallat, divided into upper and lower, or Rivkan and Zanjirvan, and twenty-two flourishing villages. It was known in former times as Anar, the Anarus of Peutinger’s tables. The city, capital of the province, is situated at an elevation of 5850 ft. in 33° 51′ N., 50° 30′ E.; pop. about 9000.

MAHAN, ALFRED THAYER (1840-), American naval officer and historian, was born on the 27th of September 1840 at West Point, New York. His father, Dennis Hart Mahan (1802-1871) was a professor in the military academy, and the author of textbooks on civil and military engineering. The son graduated at the naval academy in 1859, became lieutenant in 1861, served on the “Congress,” and on the “Pocahontas,” “Seminole,” and “James Adger” during the Civil War, and was instructor at the naval academy for a year. In 1865 he was made lieut.-commander, commander in 1872, captain in 1885. Meanwhile he saw service in the Gulf of Mexico, the South Atlantic, the Pacific, and Asia, and did shore duty at Boston, New York and Annapolis. In 1886-89 he was president of the naval war college at Newport, Rhode Island. Between 1889 and 1892 he was engaged in special service for the bureau of navigation, and in 1893 was made commander of the “Chicago,” of the European squadron. In 1896 he retired from active service, but was a member of the naval board of strategy during the war between the United States and Spain. He was a member of the peace congress at the Hague in 1899. This long and varied service gave him extensive opportunities for observation, which he supplemented by constant study of naval authorities and reflection on the interpretation of the problems of maritime history. His first book was a modest and compact story of the affairs in *The Gulf and Inland Waters* (1883), in a series of volumes by various writers, entitled *The Navy in the Civil War*; in 1890 he suddenly acquired fame by the appearance of his masterly work entitled *The Influence of Sea Power upon History, 1660-1783*. Having been impressed by the failure of historians to allow for the influence of sea power in struggles between nations, he was led to make prolonged investigations of this general theme (see Sea Power). The reception accorded the volume was instant and hearty; in England, in particular, it was deemed almost an epoch-making work, and was studied by naval specialists, cabinet ministers and journalists, as well as by a large part of the general public. It was followed by *The Influence of Sea Power upon the French Revolution and Empire* (2 vols. 1892); *The Life of Nelson, the Embodiment of the Sea Power of Great Britain* (1897); and *Sea Power in its Relations to the War of 1812* (1905). The author’s general aim in these works—some of which have been translated into French, German and Japanese—was to make the consideration of maritime matters paramount to that of military, political or economic movements, without, however, as he himself says “divorcing them from their surroundings of cause and effect in general history, but seeking to show how they modified the latter, and were modified by them.” He selected the year 1660 as the beginning of his narrative, as being the date when the “sailing-ship era, with its distinctive features, had fairly begun.” The series as a whole has been accepted as finally authoritative, supplanting its predecessors of similar aim, and almost—in the words of Theodore Roosevelt—founding a new school of naval historical writing.

Other works by Mahan are a *Life of Admiral Farragut* (1892); *The Interest of America in Sea Power* (1897); *Lessons of the War with Spain* (1899); *The Story of the War with South Africa* and *The Problem of Asia* (1900); *Types of Naval Officers drawn from the History of the British Navy* (1901); *Retrospect and Prospect*, studies of international relations (1902).

MAHANADI, or Mahanuddy (“The Great River”), a river of India. It rises in 20° 10′ N., 82° E., 25 m. S. of Raipur town, in the wild mountains of Bastar in the Central Provinces. At first an insignificant stream, taking a northerly direction, it drains the eastern portion of the Chhattisgarh plain, then a little above Seorinarayan it receives the waters which its first great affluent, the Seonath, has collected from the western portion of the plain; thence flowing for some distance due E., its stream is augmented by the drainage of the hills of Uprora, Korba, and the ranges that separate Sambalpur from Chota Nagpur. At Padampur it turns towards the south, and struggling through masses of rock, flows past the town of Sambalpur to Sonpur. From Sonpur it pursues a tortuous course among ridges and rocky crags towards the range of the Eastern Ghats. This mountain line it pierces by a gorge about 40 m. in length, overlooked by forest-clad hills. Since the opening of the Bengal-Nagpur railway, the Mahanadi is little used for navigation. It pours down upon the Orissa delta at Naraj, about 7 m. west of Cuttack town; and after traversing Cuttack district from west to east, and throwing off numerous branches (the Katjori, Paika, Biropa, Chitartala, &c.) it falls into the Bay of Bengal at False Point by several channels.

The Mahanadi has an estimated drainage area of 43,800 sq. m., and its rapid flow renders its maximum discharge in time of flood second to that of no other river in India. During unusually high floods 1,500,000 cub. ft. of water pour every second through the Naraj gorge, one-half of which, uncontrolled by the elaborate embankments, and heavily laden with silt, pours over the delta, filling the swamps, inundating the rice-fields, and converting the plains into a sea. In the dry weather the discharge of the Mahanadi dwindles to 1125 cub. ft. per second. Efforts have been made to husband and utilize the vast water supply thrown upon the Orissa

delta during seasons of flood. Each of the three branches into which the parent stream splits at the delta head is regulated by a weir. Of the four canals which form the Orissa irrigation system, two take off from the Biropa weir, and one, with its branch, from the Mahanadi weir. On the 31st of December 1868 the government took over the whole canal works from the East Indian Irrigation Company, at a cost of £941,368. The canals thus taken over and since completed, are the high-level canal, the Kendrapara canal, the Taldanda canal and the Machgaon canal, irrigating 275,000 acres.

MAHANOY CITY, a borough of Schuylkill county, Pennsylvania, U.S.A., 56 m. N.E. of Harrisburg. Pop. (1890), 11,286; (1900), 13,504, of whom 3877 were foreign-born, mostly Slavs; (1910 census) 15,936. It is served by branches of the Lehigh Valley and the Philadelphia & Reading railways. The borough is situated in the valley of Mahanoy Creek, and has an elevation of 1240 ft. above the sea; Broad Mountain (1795 ft.), a ridge extending through Schuylkill county, overlooks it on the S.E. The valley is a part of the anthracite coal region of Pennsylvania, fire clay abounds in the vicinity, and the borough's principal industries are the mining and shipping of coal, and the manufacture of shirts and foundry products. Mahanoy City, originally a part of Mahanoy township (pop. in 1910, 6256), was incorporated as a borough in 1863.

MAHAR, the name of a servile caste in the Deccan, India. Their special function, apart from that of scavenger, is to act as village watchman, as guardian of the village boundaries, and as public messenger. In some parts they are also weavers of coarse cotton cloth. In 1901 their total number in all India was just under three millions.

MAHARAJPUR, a village in Gwalior state, Central India. Pop. (1901), 366. It was the scene of a battle (Dec. 29, 1843) in which Sir Hugh Gough, accompanied by the governor-general, Lord Ellenborough, defeated the insurgent army of the Gwalior state.

MAHĀVAṂSA, the *Great Chronicle*, a history of Ceylon from the 5th century B.C. to the middle of the 5th century A.D., written in Pali verse by Mahānāma of the Dīghasanda Hermitage, shortly after the close of the period with which it deals. In point of historical value it compares well with early European chronicles. In India proper the decipherment of early Indian inscriptions was facilitated to a very great extent by the data found only in the Mahāvaṃsa. It was composed on the basis of earlier works written in Sinhalese, which are now lost, having been supplanted by the chronicles and commentaries in which their contents were restated in Pali in the course of the 5th century. The particular one on which our Mahāvaṃsa was mainly based was also called the Mahāvaṃsa, and was written in Sinhalese prose with Pali memorial verse interspersed. The extant Pali work gives legends of the Buddha and the genealogy of his family; a sketch of the history of India down to Asoka; an account of Buddhism in India down to the same date; a description of the sending out of missionaries after Asoka's council, and especially of the mission of Mahinda to Ceylon; a sketch of the previous history of Ceylon; a long account of the reign of Devānam-piya Tissa, the king of Ceylon who received Mahinda, and established Buddhism in the island; short accounts of the kings succeeding him down to Duṭṭha Gāmīin (Dadagamana or Dutegemunu); then a long account, amounting to an epic poem, of the adventures and reign of that prince, a popular hero, born in adversity, who roused the people, and drove the Tamil invaders out of the island. Finally we have short notices of the subsequent kings down to the author's time. The Mahāvaṃsa was the first Pali book made known to Europe. It was edited in 1837, with English translation and an elaborate introduction, by George Turnour, then colonial secretary in Ceylon. Its vocabulary was an important part of the material utilized in Childer's *Pali Dictionary*. Its relation to the sources from which it drew has been carefully discussed by various scholars and in especial detail by Geiger. It is agreed that it gives a reasonably fair and correct presentation of the tradition preserved in the lost Sinhalese Mahāvaṃsa; that, except in the earliest period, its list of kings, with the years of each reign, is complete and trustworthy; and that it gives throughout the view, as to events in Ceylon, of a resident in the Great Minster at Anurādhapura.

See *The Mahāvaṃsa*, ed. by Geo. Turnour (Colombo, 1837); ed. by W. Geiger (London, 1908); H. Oldenberg, in the introduction to his edition of the *Dīpavamsa* (London, 1879); O. Franke, in *Wiener Zeitschrift für die Kunde des Morgenlandes* (1907); W. Geiger, *Dīpavamsa und Mahāvamsa* (Leipzig, 1905, trans. by Ethel M. Coomaraswamy, Colombo, 1908).

(T. W. R. D.)

MAHAYANA ("Great Vehicle"), the name given to the later Buddhism, the popular religion which embraced all the people and had its pantheon of Buddhas and Bodhisatvas, with attendant deities and demons, spacious temples and images, pompous ceremonial and noisy festivals. It was thus contrasted with the Hinayana ("Little Vehicle") of the primitive Buddhism which had been only for the select few. (See BUDDHISM.)

MAHDI (Arab. "he who is guided aright"), a title assumed by the third Abbasid caliph (see CALIPHATE: *Abbasids*, § 3). According to Moslem traditionists Mahomet declared that one of his descendants, the imam of God, who would fill the earth with equity and justice, would bear the name of al-mahdi. The Sunnis hold that this mahdi has not yet appeared. The name of mahdi is also given by the Shi'ite Mahommedans to the last of the imams of the house of 'Ali. It was under the name of al-mahdi that Mokhtar proclaimed 'Ali's son Mahommed as the opponent of the caliph Abdalmalik, and, according to Shahrastani, the doctrine of the mahdi, the hidden deliverer who is one day to appear and fill the oppressed world with righteousness, first arose in connexion with a belief that this Mahommed had not died but lived concealed at Mount Radwā, near Mecca, guarded by a lion and a panther. The hidden imam of the common Shi'ites is, however, the twelfth imam, Mahommed Abu'I-Qasim, who disappeared mysteriously in 879. The belief in the appearance of the mahdi readily lent itself to imposture. Of the many pretenders to this dignity known in all periods of Moslem history the most famous was the first caliph of the Fatimite dynasty in North Africa, 'Obaidallah al-Mahdi, who reigned 909-933. After him was named the first capital of the dynasty, the once important city of Mahdia (*q.v.*). Another great historical movement, headed by a leader who proclaimed himself the mahdi (Mahommed ibn Abdallah ibn Tumart), was that of the Almohades (*q.v.*). In 1881 Mahommed Ahmed ibn Seyyid Abdullah (*q.v.*), a Dongolese, proclaimed himself al-mahdi and founded in the eastern Sudan the short-lived empire overthrown by an Anglo-Egyptian force at the battle of Omdurman in 1898. Concurrently with the claim of Mahommed Ahmed to be the mahdi the same title was claimed by, or for, the head of the Senussites, a confraternity powerful in many regions of North Africa.

MAHDIA (also spelt *Mehdia*, *Mehedia*, &c.), a town of Tunisia, on the coast between the gulfs of Hammamet and Gabes, 47 m. by rail S.S.E. of Susa. Pop. about 8000. Mahdia is built on a rocky peninsula which projects eastward about a mile beyond the normal coast line, and is not more than a quarter of a mile wide. The extremity of the peninsula is called Ras Mahdia or Cape Africa—Africa being the name by which Mahdia was designated by Froissart and other European historians during the middle ages and the Renaissance. In the centre of the peninsula and occupying its highest point is a citadel (16th century); another castle farther west is now used as a prison and is in the centre of the native town. The European quarter and the new port are on the south-west side of the peninsula. The port is available for small boats only; steamers anchor in the roadstead about a quarter of a mile from the shore. On the south-east, cut out of the rock, is the ancient harbour, or *cothon*, measuring about 480 ft by 240 ft., the entrance being 42 ft. wide. There are manufactories of olive oil, but the chief industry is sardine fishing, largely in the hands of Italians.

Mahdia occupies the site of a Phoenician settlement and by some authorities is identified with the town called Turris Hannibalis by the Romans. Hannibal is said to have embarked here on his exile from Carthage. After the Arab conquest of North Africa the town fell into decay. It was refounded in 912 by the first Fatimite caliph, 'Obaidallah-al-Mahdi, after whom it was named. It became the port of Kairawan and was for centuries a city of considerable importance, largely owing to its great natural strength, and its position on the Mediterranean. It carried on an active trade with Egypt, Syria and Spain. The town was occupied by the Normans of Sicily in the 12th century, but after holding it for about twelve years they were driven out in 1159 by the Almohades. In 1390 a joint English and French force vainly besieged Mahdia for sixty-one days. In the early part of the 16th century the corsair Dragut seized the town and made it his capital, but in 1550 the place was captured by the Spaniards, who held it until 1574. Before evacuating the town the Spaniards dismantled the fortifications. Under the rule of the Turks and, later, the beys of Tunis Mahdia became a place of little importance. It was occupied by the French in 1881 without opposition, and regained some of its former commercial importance.

During 1908 numbers of bronzes and other works of art were recovered from a vessel wrecked off Mahdia in

the 5th century A.D. (see *Classical Review*, June 1909).

MAHÉ, a French settlement in the Malabar district of Madras, India, situated in 11° 43′ N. and 75° 33′ E., at the mouth of a river of the same name. Area, 26 sq. m.; pop. (1901), 10,298. It is the only French possession on the west coast of India, and is in charge of a *chef de service*, subordinate to the governor-general at Pondicherry. It is now a decaying place.

MAHESHWAR, a town in Indore state, Central India, on the N. bank of the Narbada (Nerbudda). Pop. (1901), 7042. Though of great antiquity and also of religious sanctity, it is chiefly noted as the residence of Ahalya Bai, the reigning queen of the Holkar dynasty during the last half of the 18th century, whose ability and munificence are famous throughout India. Close by her cenotaph stands the family temple of the Holkars.

MAHI, a river of western India, which rises in Central India and, after flowing through south Rajputana, enters Gujarat and falls into the sea by a wide estuary near Cambay; total length, 300 m.; estimated drainage area, 16,000 sq. m. It has given its name to the Mahi Kantha agency of Bombay, and also to the mehwasis, marauding highlanders often mentioned in Mahommedan chronicles.

MAHI KANTHA, a political agency or collection of native states in India, within the Gujarat division of Bombay. Over half the territory is covered by the native state of Idar. There are eleven other chiefships, and a large number of estates belonging to Rajput or Koli thakurs, formerly feudatories of Baroda. Several of the states are under British administration. Total area, 3125 sq. m.; pop. (1901), 361,545, showing a decrease of 38% in the decade, due to famine; estimated revenue, £76,000; tribute (mostly to the gaekwar of Baroda), £9000. Many of the inhabitants belong to the wild tribes of Bhils and Kolis. In 1897 a metre-gauge railway was opened from Ahmedabad through Parantij to Ahmednagar. At Sadra is the Scott College for the education of the sons of chiefs on the lines of an English public school. There are also Anglo-vernacular schools at Sadra, Idar and Mansa. The famine of 1899-1900 was severely felt in this tract.

MAHMUD I. (1696-1754), sultan of Turkey, was the son of Mustafa II., and succeeded his uncle Ahmed III. in 1730. After the suppression of a military revolt the war with Persia was continued with varying success, and terminated in 1736 by a treaty of peace restoring the *status quo ante bellum*. The next enemy whom Turkey was called upon to face was Russia, later joined by Austria. War went on for four years; the successes gained by Russia were outweighed by Austria's various reverses, terminating by the defeat of Wallis at Krotzka, and the peace concluded at Belgrade was a triumph for Turkish diplomacy. The sultan, throughout desirous for peace, is said to have been much under the influence of the chief eunuch, Haji Beshir Aga. In 1754 Mahmud died of heart-disease when returning from the Friday service at the mosque. He had a passion for building, to which are due numberless kiosques, where nocturnal orgies were carried on by him and his boon companions. In this reign the system of appointing Phanariote Greeks to the principalities of Moldavia and Wallachia was instituted. (See PHANARIOTES.)

MAHMUD II. (1785-1839), sultan of Turkey, was the son of Abu-ul-Hamid I., and succeeded his brother, Mustafa IV., in 1808. He had shared the captivity of his ill-fated cousin, the ex-sultan, Selim III., whose efforts at reform had ended in his deposition by the janissaries. Mahmūd was thus early impressed with the necessity for dissembling his intention to institute reforms until he should be powerful enough to carry them through. The reforming efforts of the grand vizier Bairakdar, to whom he had owed his life and his accession, broke on the opposition of the janissaries; and Mahmud had to wait for more favourable times. Meanwhile the empire seemed in danger of breaking up. Not till 1812 was the war with Russia closed by the treaty of Bucharest, which restored Moldavia and the greater part of Wallachia to the Ottoman government. But though the war was ended, the terms of the treaty left a number of burning questions, both internal and external, unsettled. This was notably the case with the claim of Russia to Poti and the valley of the Rion (Phasis), which was still outstanding at the time of the congress of Vienna (1814-1815) and prevented the question of a European guarantee of the integrity of Turkey from being considered.

Meanwhile, within the empire, ambitious valis were one by one attempting to carve out dominions for themselves at the expense of the central power. The ambitions of Mehemet Ali of Egypt were not yet fully revealed; but Ali (*q.v.*) of Jannina, who had marched to the aid of the sultan against the rebellious pasha Pasvan Oglu of Widdin, soon began to show his hand, and it needed the concentration of all the forces of the Turkish empire to effect his overthrow and death (1822). The preoccupation of the sultan with Ali gave their opportunity to the Greeks whose disaffection had long been organized in the great secret society of the *Hetaeria Philike*, against which Metternich had in vain warned the Ottoman government. In 1821 occurred the abortive raid of Alexander Ypsilanti into the Danubian principalities, and in May of the same year the revolt of the Greeks of the Morea began the war of Greek Independence (see GREECE: *History*). The rising in the north was easily crushed; but in the south the Ottoman power was hampered by the defection of the sea-faring Greeks, by whom the Turkish navy had hitherto been manned. After three abortive campaigns Mahmud was compelled, infinitely against his will, to summon to his assistance the already too powerful pasha of Egypt, Mehemet Ali, whom he had already employed to suppress the rebellious Wahhabis in Arabia. The disciplined Egyptian army, supported by a well organized fleet, rapidly accomplished what the Turks had failed to do; and by 1826 the Greeks were practically subdued on land, and Ibrahim was preparing to turn his attention to the islands. But for the intervention of the powers and the battle of Navarino Mahmud's authority would have been restored in Greece. The news of Navarino betrayed Mahmud into one of those paroxysms of rage to which he was liable, and which on critical occasions were apt fatally to cloud his usual good sense. After in vain attempting to obtain an apology for "the unparalleled outrage against a friendly power" he issued on the 20th of December a solemn *hatti sheriff* summoning the faithful to a holy war. This, together with certain outstanding grievances and the pretext of enforcing the settlement of the Greek Question approved by the powers, gave Russia the excuse for declaring war against Turkey. After two hardly fought campaigns (1828, 1829) Mahmud was at length, on the 14th of September 1829, compelled to sign the peace of Adrianople. From this moment until his death Mahmud was, to all intents and purposes, the "vassal of Russia," though not without occasional desperate efforts to break his chains. (For the political events of the period between the first revolt of Mehemet Ali (Sept. 1832) and the death of Mahmud see MEHEMET ALI.) The personal attitude of the sultan, which alone concerns us here, was determined throughout by his overmastering hatred of the upstart pasha, of whom he had stooped to ask aid, and who now defied his will; and the importance of this attitude lies in the fact that, as the result of the success of his centralizing policy, and notably of the destruction of the janissaries (*q.v.*), the supreme authority, hitherto limited by the practical power of the ministers of the Porte and by the turbulence of the privileged military caste, had become concentrated in his own person. It was no longer the Porte that decided, but the Seraglio, and the sultan's private secretary had more influence on the policy of the Ottoman empire than the grand vizier.

This omnipotence of the sultan in deciding the policy of the government was in striking contrast with his impotence in enforcing his views on his subjects and in his relations with foreign powers. Mahmud, in spite of —or rather because of—his well-meant efforts at reform, was hated by his Mussulman subjects and stigmatized as an "infidel" and a traitor to Islam. He was, in fact, a victim to those "half-measures" which Machiavelli condemns as fatal to success. Ibrahim, the conqueror of Syria, scoffed at the sultan's idea "that reform consisted in putting his soldiers into tight trousers and epaulettes." The criticism is not entirely unjust. Mahmud's policy was the converse of that recommended by Machiavelli, viz. in making a revolution to change the substance while preserving the semblance of the old order. Metternich's advice to Mahmud to "remain a Turk" was sound enough. His failure to do so—in externals—left him isolated in his empire: *rayahs* and true believers alike distrusted and hated him. Of this hatred he was fully conscious; he knew that his subjects, even many of his own ministers, regarded Mehemet Ali as the champion of Islam against the "infidel sultan;" he suspected the pasha, already master of the sacred cities, of an intention to proclaim himself caliph in his stead. This, together with the weakness due to military reforms but recently begun, drove him to rely on foreign aid; which, in the actual conditions of Europe, meant the aid of Russia. The long tradition of French friendship for Turkey had been broken, in 1830, by the conquest of Algiers. Austria was, for the time, but the faithful ally of the tsar. On the 9th of August 1832 Mahmud made, through Stratford Canning, a formal proposal for an alliance with Great Britain, which Palmerston refused to consider for fear of offending France. Mahmūd bitterly contrasted the fair professions of England with the offers of effective help from Russia. His old ally having deserted him, he accepted the aid of his hereditary foe. The Russian expedition to the Bosporus, the convention of Kutaiah, and the treaty of Unkiar Skelessi (July 8, 1833) followed. Mahmud was under no illusion as to the position in which the latter placed him towards Russia; but his fear of Mehemet Ali and his desire to be revenged upon him outweighed all other considerations. He resented the action of France and England in forcing the settlement of Kutaiah upon him, and remained shut up in his palace, inaccessible to all save his favourites and the representative of Russia. With his single aim in view he busied himself with the creation of a national militia, with the aid of Moltke and other German officers. In 1834 the revolt of Syria against Ibrahim seemed to give him his opportunity. He pleaded the duty of a sultan to go to the aid of his subjects when oppressed by one of his servants; but the powers were obdurate, even Russia, much occupied in affairs nearer home, leaving him in the lurch. He was astute enough to take advantage of the offence given to

the powers by Mehemet Ali's system of monopolies, and in 1838 signed with Great Britain, and afterwards with others, a commercial treaty which cut at the root of the pasha's system. A few months later his passionate impatience overcame his policy and his fears. The hand of death was upon him, and he felt that he must strike now or never. In vain the powers, now united in their views, warned him of the probable consequences of any aggressive action on his part. He would rather die, he exclaimed, or become the slave of Russia, than not destroy his rebellious vassal. On his sole initiative, without consulting his ministers or the council of the empire, he sent instructions to Hafiz Pasha, commanding the Ottoman troops concentrated at Bir on the Euphrates, to advance into Syria. The fatal outcome of the campaign that followed he did not live to hear. When the news of Ibrahim's overwhelming victory at Nessib (June 24, 1839) reached Constantinople, Mahmud lay dying and unconscious. Early in the morning of the 1st of July his proud and passionate spirit passed away.

Mahmud II. cannot be reckoned among the great sultans, neither had he any of the calculating statecraft which characterized Abd-ul-Hamid II.; but his qualities of mind and heart, none the less, raised him far above the mass of his predecessors and successors. He was well versed in state affairs and loyal to those who advised and served him, personally brave, humane and kindly when not maddened by passion, active and energetic, and always a man of his word. Unhappily, however, the taint of the immemorial corruption of Byzantium had fallen upon him too, and the avenue to his favour and to political power lay too often through unspeakable paths. In view of the vast difficulty of the task before him at his succession it is less surprising that he failed to carry out his ideas than that he accomplished so much. When he came to the throne the empire was breaking up from within; one by one he freed the provinces from the tyrannical rulers who, like Ali of Jannina, were carving out independent, or quasi-independent, empires within the empire. If he failed in his wider schemes of reform, this was only one more illustration of a truth of which other "enlightened" sovereigns besides himself had experienced the force, namely, that it is impossible to impose any system, however admirable, from above on a people whose deepest convictions and prejudices it offends.

There is a great deal of valuable material for the history of Mahmud and his policy in the unpublished F.O. records (1832-1839), volumes of correspondence marked *Turkey.—From Sir Stratford Canning.—From Mr. Mandeville.—From Lord Ponsonby.* See further works mentioned under TURKEY: *History*; and MEHEMET ALI.

(W. A. P.)

MAHMUD NEDIM PASHA

(*c.* 1818-1883), Turkish statesman, was the son of Nejib Pasha, ex-governor-general of Bagdad. After occupying various subordinate posts at the Porte he became successively under-secretary of state for foreign affairs, governor-general of Syria and Smyrna, minister of commerce, and governor-general of Tripoli; minister successively of justice and of marine (1869); grand vizier from 1871 to 1872 and from 1875 to 1876. He was high in favour with Sultan Abd-ul-Aziz and fell much under the influence of General Ignatiev, the forceful Russian ambassador before the war of 1877-78, his subserviency to Russia earning for him the nickname of "Mahmudoff." His administration was most unsuccessful from every point of view, and he was largely responsible for the issue of the decree suspending the interest on the Turkish funds. He was minister of the interior from 1879 to 1883.

MAHMUD[1] OF GHAZNI

(971-1030), son of Sabuktagīn, Afghan conqueror, was born on the 2nd of October 971. His fame rests chiefly on his successful wars, in particular his numerous invasions of India. His military capacity, inherited from his father, Nasir-ud-din Sabuktagīn, was strengthened by youthful experience in the field. Sabuktagīn, a Turki slave of Alptagīn, governor of Khorasan under Abdalmalik I. b. Nuḥ of the Samanid dynasty of Bokhara, early brought himself to notice (see SAMANIDS). He was raised to high office in the state by Alptagīn's successor, Abū Ishāk, and in A.H. 366 (A.D. 977), by the choice of the nobles of Ghazni, he became their ruler. He soon began to make conquests in the neighbouring countries, and in these wars he was accompanied by his young son Mahmud. Before he had reached the age of fourteen he encountered in two expeditions under his father the Indian forces of Jaipal, raja of Lahore, whom Sabuktagīn defeated on the Punjab frontier.

In 994 Mahmud was made governor of Khorasan, with the title of Saif addaula (ud-daula) ("Sword of the State") by the Sāmānīd Nūh II. Two years later, his father Sabuktagīn died in the neighbourhood of Balkh, having declared his second son, Ismail, who was then with him, to be his successor. As soon as Ismail had assumed the sovereignty at Balkh, Mahmud, who was at Nishapur, addressed him in friendly terms, proposing a division of the territories held by their father at his death. Ismail rejected the proposal, and was immediately attacked by Mahmud and defeated. Retreating to Ghazni, he there yielded, and was imprisoned, and Mahmud obtained undisputed power as sovereign of Khorasan and Ghazni (997).

The Ghaznevid dynasty is sometimes reckoned by native historians to commence with Sabuktagīn's conquest of Bost and Kosdār (978). But Sabuktagīn, throughout his reign at Ghazni, continued to acknowledge the Sāmānid suzerainty, as did Mahmud also, until the time, soon after succeeding to his father's dominions, when he received from Qādir, caliph of Bagdad (see CALIPHATE, C. § 25), a *khilat* (robe of honour), with a letter recognizing his sovereignty, and conferring on him the titles *Yamiīn-addaula* ("Right hand of the State"), and *Amīn-ul-Millat* ("Guardian of the Faith"). From this time it is the name of the caliph that is inscribed on

Mahmud's coins, together with his own new titles. Previously the name of the Sāmānid sovereign, Mansūr II. b. Nūh is given along with his own former title, Saif addaula Mahmūd. The earliest of those of the new form gives his name Mahmūd bin Sabuktagīn. Thereafter his father's name does not appear on his coins, but it is inscribed again on his tomb.

The new honours received from the caliph gave fresh impulse to Mahmud's zeal on behalf of Islam, and he resolved on an annual expedition against the idolaters of India. He could not quite carry out this intention, but a great part of his reign was occupied with his Indian campaigns. In 1000 he started on the first of these expeditions, but it does not appear that he went farther than the hill country near Peshawar. The hostile attitude of Khalaf ibn Ahmad, governor of Seistan, called Mahmud to that province for a short time. He was appeased by Khalaf's speedy submission, together with the gift of a large sum of money, and further, it is said, by his subdued opponent addressing him as *sultān*, a title new at that time, and by which Mahmud continued to be called, though he did not formally adopt it, or stamp it on his coins. Four years later Khalaf, incurring Mahmud's displeasure again, was imprisoned, and his property confiscated.

Mahmud's army first crossed the Indus in 1001, opposed by Jaipāl, raja of Lahore. Jaipāl was defeated, and Mahmud, after his return from this expedition, is said to have taken the distinctive appellation of *Ghāzi* ("Valiant for the Faith"), but he is rarely so-called. On the next occasion (1005) Mahmud advanced, as far as Bhera on the Jhelum, when his adversary Anang-pāl, son and successor of Jaipāl, fled to Kashmir. The following year saw Mahmud at Multan. When he was in the Punjab at this time, he heard of the invasion of Khorāsan by the Ilek Khan Nasr I. ruler of Transoxiana whose daughter Mahmud had married. After a rapid march back from India, Mahmud repelled the invaders. The Ilek Khan, having retreated across the Oxus, returned with reinforcements, and took up a position a few miles from Balkh, where he was signally defeated by Mahmud.

Mahmud again entered the Punjab in 1008, this time for the express purpose of chastising Sēwah Pāl, who, having become a Mussulman, and been left by Mahmud in charge of Multan, had relapsed to Hinduism. The Indian campaign of 1009 was notable. Near the Indus Mahmud was opposed again by Anang-pāl, supported by powerful rajas from other parts of India. After a severe fight, Anang-pāl's elephants were so terror-struck by the fire-missiles flung amongst them by the invaders that they turned and fled, the whole army retreating in confusion and leaving Mahmud master of the field. Mahmud, after this victory, pushed on through the Punjab to Nagar-kōt (Kangra), and carried off much spoil from the Hindu temples to enrich his treasury at Ghazni. In 1011 Mahmud, after a short campaign against the Afghans under Mahommed ibn Sūr in the hill country of Ghur, marched again into the Punjab. The next time (1014) he advanced to Thanēsar, another noted stronghold of Hinduism, between the Sutlej and the Jumna. Having now found his way across all the Punjab rivers, he was induced on two subsequent occasions to go still farther. But first he designed an invasion of Kashmir (1015), which was not carried out, as his progress was checked at Lōh-kōt, a strong hill fort in the north-west of the Punjab. Then before undertaking his longer inroad into Hindustan he had to march north into Khwārizm (Khiva) against his brother-in-law Mamūn, who had refused to acknowledge Mahmud's supremacy. The result was as usual, and Mahmud, having committed Khwārizm to a new ruler, one of Mamūn's chief officers, returned to his capital. Then in 1018, with a very large force, he proceeded to India again, extending his inroad this time to the great Hindu cities of Mathra on the Jumna and Kanauj on the Ganges. He reduced the one, received the submission of the other, and carried back great stores of plunder. Three years later he went into India again, marching over nearly the same ground, to the support, this time, of the raja of Kanauj, who, having made friendship with the Mahommedan invader on his last visit, had been attacked by the raja of Kalinjar. But Mahmud found he had not yet sufficiently subdued the idolaters nearer his own border, between Kabul and the Indus, and the campaign of 1022 was directed against them, and reached no farther than Peshawar. Another march into India the following year was made direct to Gwalior.

The next expedition (1025) is the most famous of all. The point to which it was directed was the temple of Somnath on the coast of the Gujarāt peninsula. After an arduous journey by Multan, and through part of Rajputana, he reached Somnath, and met with a very vigorous but fruitless resistance on the part of the Hindus of Gujarāt. Moslem feet soon trod the courts of the great temple. The chief object of worship it contained was broken up, and the fragments kept to be carried off to Ghazni. The story is often told of the hollow figure, cleft by Mahmud's battle-axe, pouring out great store of costly jewels and gold. But the idol in this Sivite temple was only a tall block or pillar of hewn stone, of a familiar kind. The popular legend is a very natural one. Mahmud, it was well known, made Hindu temples yield up their most precious things. He was a determined idol-breaker. And the stone block in this temple was enriched with a crown of jewels, the gifts of wealthy worshippers. These data readily give the Somnath exploit its more dramatic form. For the more recent story of the Somnath gates see Somnath.

After the successes at Somnath, Mahmud remained some months in India before returning to Ghazni. Then in 1026 he crossed the Indus once more into the Punjab. His brilliant military career closed with an expedition to Persia, in the third year after this, his last, visit to India. The Indian campaigns of Mahmud and his father were almost, but not altogether, unvarying successes. The Moslem historians touch lightly on reverses. And, although the annals of Rajputana tell how Sabuktagīn was defeated by one raja of Ajmere and Mahmud by his successor, the course of events which followed shows how little these and other reverses affected the invader's progress. Mahmud's failure at Ajmere, when the brave raja Bisal-deo obliged him to raise the siege but was himself slain, was when the Moslem army was on its way to Somnath. Yet Mahmud's Indian conquests, striking and important in themselves, were, after all, in great measure barren, except to the Ghazni treasury. Mahmud retained no possessions in India under his own direct rule. But after the repeated defeats, by his father and himself, of two successive rajas of Lahore, the conqueror assumed the right of nominating the governors of the Punjab as a dependency of Ghazni, a right which continued to be exercised by seven of his successors. And for a time, in the reign of Masa'ud II. (1098-1114), Lahore was the place of residence of the Ghaznevid sovereign.

Mahmud died at Ghazni in 1030, the year following his expedition to Persia. He is conspicuous for his military ardour, his ambition, strong will, perseverance, watchfulness and energy, combined with great courage and unbounded self-reliance. But his tastes were not exclusively military. His love of literature brought men of learning to Ghazni, and his acquaintance with Moslem theology was recognized by the learned

doctors.

The principal histories of Mahmud's reign are—*Kitāb-i-Yamīnī* (Utbi); *Tarīkh-us-Subuktigīn* (Baihaki); *Tabakāt i Nasiri* (Minhāj el-Sirāj); *Rauzat-us-Safa* (Mir Khond); *Habīb-us-Sivar* (Khondamir). See Elliot, *History of India*; Elphinstone, *History of India*; and Roos-Keppel's translation of the *Tarīkh-i-Sultan Mahmūd-i-Ghaznavi* (1901).

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1 The name is strictly Maḥmūd.

MAHOBA, an ancient town in India, in Hamirpur district of the United Provinces. Pop. (1901), 10,074. As the capital of the Chandel dynasty, who ruled over Bundelkhand from the 9th to the 13th century, the neighbourhood is covered with architectural antiquities, prominent among which are artificial lakes, formed by banking up valleys with masonry dams. The largest of these is more than 4 m. in circuit.

MAHOGANY, a dark-coloured wood largely used for household furniture, the product of a large tree indigenous to Central America and the West Indies. It was originally received from Jamaica; 521,300 ft. were exported from that island in 1753. It is known botanically as *Swietenia Mahogani*, and is a member of the order *Meliaceae*. It bears compound leaves, resembling those of the ash, and clusters of small flowers, with five sepals and petals and ten stamens which are united into a tube. The fruit is a pear-shaped woody capsule, and contains many winged seeds. The dark-coloured bark has been considered a febrifuge, and the seeds were used by the ancient Aztecs with oil for a cosmetic, but the most valuable product is the timber, first noticed by the carpenter on board Sir Walter Raleigh's ship in 1595 for its great beauty, hardness and durability. Dr Gibbons brought it into notice as well adapted for furniture in the early part of the 18th century, and its use as a cabinet wood was first practically established by a cabinet-maker named Wollaston, who was employed by Gibbons to work up some mahogany brought to England by his brother. It was introduced into India in 1795, and is now cultivated in Bengal and as far north as Saharunpur.

The timber of species of *Cedrela* and *Melia*, other members of the order *Meliaceae*, are used as Mahogany, and the product of the West African *Khaya senegalensis* is known as African mahogany. There is some confusion between the product of these various trees. Herbert Stone (*The Timbers of Commerce*, 1904) says: "The various species of mahogany and cedar are so confusing that it is difficult to make precise statements as to their structure or origin. I know of no convincing proof that any of the American kinds met with on the English market are the wood of *Swietenia Mahogani*, nor that those shipped from Africa are the wood of *Khaya senegalensis*. These two genera are very nearly allied to *Cedrela* and *Melia*, and it is difficult to separate any of the four from the rest by the characters of the wood. After giving the most careful attention to every detail, I lean to the view that most if not all of the mahoganies commonly met with are Cedrelas."

Kiggelaria Dregeana (natural order *Bixineae*), a native of South Africa, is known as Natal mahogany.

MAHOMET (strictly Muḥammad, commonly also Mohammed), founder of the religious system called in Europe after him Mahommedanism, and by himself Islam or Ḥanifism. He died, according to the ordinary synchronism, on the 7th of June 632 (12 Rabia, A.H. 11), and his birthday was exactly sixty-three or sixty-five years earlier, the latter number being evidently an interpretation in lunar years of a number thought to refer to solar years. The lunar system was introduced into Arabia by Mahomet himself quite at the close of his career; that which existed before was certainly solar, as it involved a process of intercalation—which, however, seems to have been arbitrarily manipulated by priests, whence certain synchronisms cannot be got for the events in the Prophet's career. The number 63 for the years of his life may rest on tradition, though it is unlikely that such matters were accurately noted; it can also be accounted for by a priori combination. A Meccan, it is said, became a full citizen at the age of 40; this then would be the age at which the mission might be started. The Medina period (of which count was kept) lasted ten to eleven years; for the Meccan period ten years would seem a likely length. Finally it was known that for some years—about three—the mission had been conducted secretly. The only event in contemporary history to which the Koran alludes in its earlier parts is the Persian conquest of Palestine in 616. Clearly Mahomet had begun to prophesy at that date.

His Country.

Before the rise of Islam, Mahomet's native place, Mecca, appears to figure nowhere in historical records, unless there be a reference to it in the "valley of Baca" (Psalm lxxxiv. 6). Its sacred, and therefore archaic, name is *Bakkah*; hence the identification of the name with that of the sanctuary Makoraba, known to the Greek geographers, is not philologically tenable; although so eminent a linguist

as Dozy evolved a theory of the origin of the city from this name, which appears to be South Arabian for "sanctuary," and has no connexion with Hebrew (as Dozy supposed). In the 3rd century of Islam the mythology of Mecca was collected and published in book form, but we learn little more from it than names of tribes and places; it is clear that there was no record of the mode in which the community inhabiting the place had got there, and that little was remembered with accuracy of the events which preceded the rise of its prophet. The city had a sanctuary, called the *Cube* (*ka'ba*), of which the nucleus was the "Black Stone," probably to be identified with Allah, the god of the community; both still exist, or rather their legitimate substitutes, as the Ka'ba has been repeatedly reconstructed, and the original Black Stone was stolen by the Carmathians in the 4th century of Islam; they afterwards returned one, but it may or may not have been the same as that which they removed. At some time in the 6th century—said to have been the birth-year of the Prophet, but really much earlier—an Abyssinian invader raided Mecca with the view of abolishing this sanctuary; but for some reason had to desist. This expedition, known as the "Raid of the Elephant," one of these animals being employed in it, seems to be of great importance for explaining the rise of Islam; for a sanctuary which can repel an invader acquires tremendous reputation. Some verses in the Koran which are perhaps not genuine, record the miracle whereby Allah repelled the "People of the Elephant." The sanctuary was apparently in the possession of the tribe Koreish (Quraish), the origin of whose name is unknown, said to have come originally from Cutha in Mesopotamia. They were known (we are told) as the people of Allah, and, by wearing a badge, were sacrosanct throughout Arabia. If this be true, it was probably a privilege earned by the miraculous defence of the Ka'ba, and is sufficient to account for the rise of Meccan commerce of which we hear much in the biography of the Prophet, and to which some verses of the earliest part of the Koran allude; for merchants who were safe from attacks by bandits would have an enormous advantage. The records seem, however, to be inconsistent with this assertion; and the growth of the Meccan commerce is sufficiently accounted for by the fact that after the Abyssinian invasion pilgrimage to the Ka'ba became the practice of numerous Arab tribes, and for four months in the year (selected by Meccan priests) raiding was forbidden, in order to enable the pilgrimage to be safely made. In addition to this it would seem that all Mecca counted as sanctuary—*i.e.* no blood might under any circumstances be shed there. The community lived by purveying to pilgrims and the carrying trade; and both these operations led to the immigration of strangers.

Mahomet's Family.

There seems to be no doubt that Mahomet was himself a member of the tribe Koreish, and indeed too many of his relatives figure in history to permit of his parentage being questioned. His cousin 'Ali, fourth caliph, was the son of Abū Ṭālib, whose name attests the historical character of the kindred name 'Abd al-Moṭṭalib, Mahomet's grandfather: for the fact that this name is in part enigmatical is certainly no argument against its genuineness. In the 3rd century of Islam a document was shown in which a man of San'a in Yemen acknowledged that he had borrowed from 'Abd al-Moṭṭalib 1000 silver dirhems of the Hudaida standard, and Allāh with the two "angels" (probably a euphemism for the goddesses Al-lāt and al-'Uzzā) served as witness; it is difficult to see why such a document should have been forged. The name Hāshim (for 'Abd al-Moṭṭalib's father) may or may not be historical; here, as in the ascending line throughout, we have subjects without predicates. The name of 'Abd al-Moṭṭalib's son, who was Mahomet's father, is given as 'Abdallāh; the correctness of this has been questioned, because "Servant of Allah" would seem to be too appropriate, and the name was often given by the Prophet to converts as a substitute for some pagan appellation. This, however, is hypercritical, as the name of the father could not easily be altered, when relatives abounded, and it would seem that at one time the Prophet made no theological use of the name Allah, for which he intended to substitute Raḥmān. The name of his mother is given as Āminah, and with this one of his own titles, Amīn, agrees; although the Arabs do not appear to bring the two into connexion. Her father's name is given as Wahb, and she is brought into relation with a Medinese tribe called the Banū 'Adī b. al-Najjār, to whom she is said to have brought her son in his early infancy. The circumstances may have been suggested by his later connexion with that place; yet in what seems a historical narrative her grave is mentioned as known to be at Abwa, midway between the two cities, whence this early bond between the Prophet and his future home may have really existed.

His own name is given in the Koran in the forms Aḥmad and the familiar Muḥammad; in contemporary poetry we also find the form Maḥmūd. Similar variation between derivatives from the same root is found in proper names which occur in early poetry; the meaning of all would be "the praised," if the root be given its Arabic signification—"the desired" if interpreted from the Hebrew.

> The form Muḥammad (ordinarily transliterated Mohammed; Mahomet, Mehmet, &c., represent the Turkish pronunciation) is found in a pre-Islamic inscription, and appears to have been fairly common in Arabia. In Hag. ii. 7 a derivative of the Hebrew equivalent root occurs in the prophecy "and the desired of all nations shall come," and this passage has suggested the idea that the name may have been taken by the Prophet as the equivalent of "Messiah," while the Moslems themselves find its equivalent in the *Paraclete* of the Fourth Gospel, though this identification requires more ingenuity. His *kunyah* (*i.e.* the Arab title of respect, in which a man is called after his son) is Abu'l-Qāsim; other names by which he is called are titles of honour, *e.g.* Muṣṭafā "chosen." (See further the genealogical table, *ad fin.*)

Early Life.

In the Koran, Allah says that He found the Prophet an orphan, poor and astray; it is possible that all these expressions should be understood figuratively, like the "poor, naked, blind" of Christian hymns; the Arabs, however, take them literally, and Mahomet is said to have been a posthumous child, whose mother died a few months or years after his birth, and who was brought up first by his grandfather, and then by his uncle Abū Ṭālib, one of the poorer members of the family; in the controversy between the Alid and Abbasid pretenders of the 2nd century of Islam the Abbasid Manṣūr claims that his ancestor fed the ancestor of 'Ali, *i.e.* Abū Ṭālib, otherwise he would have had to beg. There was evidently an apparent inconsistency between Mahomet's being a poor orphan and the favourite grandchild of the eminent and wealthy 'Abd al-Moṭṭalib; and it was solved in this way. There was a tradition that in his early years he was sent into the desert to acquire the habits and the language of the Bedouins; and this seems to have been attested by the Prophet himself. In a tribal fight he is said to have acted as armour-bearer to one of his uncles, Zubair. There seems no doubt that he often accompanied Meccan caravans to the countries with which the Meccans had trade relations; such especially were Syria and south Arabia, and perhaps Egypt and Mesopotamia. It is conceivable that he may have visited Abyssinia by sea. For though accurate knowledge is nowhere to be found in the Koran, it exhibits a large amount of miscellaneous information, such as a trader

might well pick up. His career as a caravan-conductor appears to have terminated with his marriage to Khadīja, daughter of Khuwailid, represented by the tradition as a wealthy widow, fifteen years his senior and forty years of age at the time of the union. As she became the mother of a numerous family, a special rule was discovered by Moslem physiologists extending the child-bearing period of Korashite women beyond that of others. Since it is claimed for Mahomet that he first gave Arab women the right to inherit property, the difficulty noticed is not the only one connected with this marriage; and Robertson Smith has called attention to some others, unconnected with his theory of "marriage and kinship in early Arabia." After his marriage Mahomet appears to have been partner in a shop in Mecca; where he apparently sold agricultural produce. His style is strongly marked by phrases and metaphors drawn from trade, though as a statesman he never displayed any financial ability.

Education.

Writing in the monumental script of South Arabia had been known for centuries in the peninsula; and shortly before the rise of Islam a cursive script—the parent of the ordinary Arabic character—had been started in the Christian state of Hira, with which the beginnings of modern Arabic literature are connected. A modification of this had been introduced into Mecca, and was probably used for contracts and similar documents. The word *ummī*, literally "popular" or "plebeian" (according to one etymology), applied to Mahomet in the Koran, is said to mean "one who can neither read nor write," and the most generally accepted view is that he could do neither, a supposition which enters into the doctrine of the miraculous nature of the Koran. According to another interpretation the word means "Meccan," *i.e.* native of "the Mother of the Villages" (*Umm al-Qura*); and the most probable theory is that he could do both, but unskilfully. Indeed on one historic occasion he erased certain words in a document; and where in the Koran he rebuts the charge of "taking notes," he does not employ the obvious retort that he could not write, but gives a far less convincing answer. For poetry, which seems to have been cultivated in Arabia long before his time, he possessed no ear; but we have little reason for supposing that either writing or versification had yet entered into Arabian education. The former would be acquired by those who needed it, the latter was regarded as a natural gift. There is reason for thinking the language of the Koran incorrect and ungrammatical in parts, but as it afterwards became the ultimate standard of classical Arabic, this point is not easy to prove. On the whole then his early life seems to have been such as was normal in the case of a man belonging to one of the more important families in a community which had not long been started on a career of prosperity.

Social System.

Of the organization of that community we unfortunately know very little, though we hear of a council-chamber, and, as has been seen, of an age-qualification for admission to it. It is, however, certain that the theory of decision by majority was absolutely unknown to Mahomet's second successor, whence we learn little from this tradition (even if it be authentic) of the mode whereby the tribes who together formed the Meccan population managed their common concerns, whether commercial or political. The form of government seems to have been a rudimentary oligarchy, directed by some masterful individual; before the Flight we read of various prominent personages, after the Flight and the battle of Badr (A.H. 2) one chieftain, Abū Sofiān (see Caliphate, *ad init.*), appears to take the lead whether in war or in policy. It would seem, however, that the right of independent action belonged to the individual tribes, even to the extent of refusing to take part in a campaign. For the settlement of ordinary disputes recourse was had (it appears) rather to soothsayers, near or distant, than to any regularly constituted authority or tribunal. On the other hand we are furnished with a list of officials who were concerned with different parts of the festal performances and the ordinary worship. Of these we may mention the Custodian of the Ka'ba, and the official whose duty was *siqāyah* ("watering"), said to mean furnishing the pilgrims with water, but more ingeniously interpreted in recent times as "rain-bringing," a function which even in the 2nd century of Islam the governor in some places was supposed to exercise.

Beginnings of the Mission.

Of Arabian paganism we possess no trustworthy or complete account; since we hear of no theological literature belonging to it, probably no such account could have been given. There were doubtless a variety of practices, many of which have been continued to this day in the ceremonies of the pilgrimage, and offerings of different sorts to various deities, interpreted variously by the worshippers in accordance with their spiritual, intellectual and moral levels; *e.g.* as actual stones, or as men (or more often women) residing in the stones or otherwise connected with them, or bearing a similar relation to trees, or stars, &c. In general every tribe had its patron of the kind, and where there were aggregations of tribes, connexions were established between these deities, and affiliation-theories excogitated; hence the theory attributed in the Koran to the Meccans that the goddesses al-'Uzzā, &c. were the daughters of Allah, may well represent the outcome of such speculation. These, however, were known to few, whereas the practices were familiar to all. Some of these were harmless, others barbarous; many offensive, but not very reprehensible, superstitions.

External Influences.

Before Mahomet's time Arabian paganism had already been attacked both from the outside and from the inside. On the one hand the northern tribes had gradually been christianized, owing to the influence of the Byzantine empire; on the other hand south Arabia had fallen successively under Jewish, Abyssinian and Persian influence; and the last, though little is known of Persian rule, is unlikely to have favoured pagan cults. Christianity had also some important representation in Najran far south of Mecca, while Jewish settlements were prospering north of Mecca in the Prophet's future home Yathrib and its neighbourhood. Power, civilization and learning were thus associated with monotheism (Judaism), dualism (Mazdaism) and tritheism (as the Arabs interpreted Christianity); paganism was the religion of ignorance (*jāhiliyyah*, interpreted by Goldziher as "barbarism," but the difference is not very considerable). Mecca itself and the neighbouring and allied Ṭāif are said to have produced some monotheists or Christians, who identified the *Allah* of Mecca with the *Allāhā* or God of the Syrian Christians, called by the Abyssinian Christians "Lord of the Regions," and by the Jews "the Merciful" (*Raḥmānā*); one such is said to have been a cousin of Khadija, Mahomet's wife; his name is given as Waraqah, son of Naufal, and he is credited with copying or translating a Gospel. We even hear of flagellant monks and persons vowed to total abstinence among the precursors of Islam.

With these persons Mahomet had little in common, since they do not appear to have claimed to enforce their views upon others, or to have interfered with politics. He appears mainly to have been struck by the

personality of the founders of the systems dominant in the civilized world, and to have aspired from the first to occupy the place of legislator or mouthpiece of the Deity; and that he was this was and is the main proposition of the Mahommedan creed. The “Prophet” or “Apostle” (at different times he employed both the Jewish and the Christian phrase) was the divinely appointed dictator of his community; if he were not obeyed, divine vengeance would overtake the disobedient. At this proposition Mahomet arrived by induction from the records of the Biblical prophets, as well as others who seem to have figured in Arabian mythology, *e.g.* the destruction of the tribe Thamūd (mentioned by Pliny, and therefore historical) for their disobedience to their prophet Ṣāliḥ, and of ‘Ad (probably mythical) for their similar treatment of Hūd. The character of the message did not affect the necessity for obedience; at times it was condemnation of some moral offence, at others a trivial order. Divine vengeance overtook those who disobeyed either.

The Prophet’s Call.

This is the theory of the prophetic office which pervades the Koran, wherein the doctrine is formulated that every nation had its divine guide and that Mecca before Mahomet’s time had none. This place, then, Mahomet felt a divine call to fill. But we are never likely to ascertain what first put the idea into his mind. The fables which his biographers tell on this subject are not worth repeating; his own system, in which he is brought into direct communication with the Deity, though at a later period the angel Gabriel appears to have acted as intermediary, naturally leaves no room for such speculations; and since his dispensation was thought to be absolutely new, and to make a *tabula rasa* of the pagan past, his first followers, having broken with that past, left no intelligible account of the state of affairs which preceded their master’s call. Some generations therefore elapsed before that past was studied with any sort of sympathy, and details could not then be recovered, any more than they can now be supplied by conjecture.

So far as Mahomet may be said from the first to have formulated a definite notion of his work, we should probably be right in thinking it to be the restoration of the religion of Abraham, or (as the Koran calls him) Ibrahim. Though we have no reason for supposing the name of Abraham or Ishmael to have been known in Mecca generally before Mahomet’s time, the Biblical ethnology was not apparently questioned by those who were told of it, and there are stories, not necessarily apocryphal, of precursors of Mahomet going abroad in search of the “religion of Abraham.” One feature of that system, associated in the Bible with the name of Ishmael as well, was circumcision, which was actually observed by the Meccan tribes, though it would appear with technical differences from the Jewish method; the association of monotheism with it would seem reasonable enough, in view of Jewish traditions, such as Mahomet may have heard on his travels; why the doctrine of the future life should be coupled with it is less obvious. That the Meccan temple and its rites had been founded by these two patriarchs appears to have been deduced by Mahomet himself, but perhaps at a later stage of his career. That these rites, so far as they were idolatrous, were in flagrant defiance of the religion of Abraham must have struck any one who accepted the accounts of it which were current among Jews and Christians. The precursors, however, appear to have felt no call to reform their fellow-citizens; whereas it is evident that Mahomet regarded himself as charged with a message, which he was bound to deliver, and which his God would in some way render effective.

As it was obvious that the claim to be God’s mouthpiece was to claim autocracy, Mahomet employed the utmost caution in his mode of asserting this claim; on the question of his sincerity there have been different opinions held, and it is not necessary to take any view on this matter. For three years his followers were a secret society; and this period appears to have been preceded by one of private preparation, the first revelation being received when the Prophet was in religious retirement—a ceremony called *taḥannuth*, of which the meaning is uncertain, but which can have no connexion with the Hebrew *teḥinnōth* (“supplications”) —on Mount Ḥirā, near Mecca.

The Koran.

If the traditional dates assigned to the *suras* (chapters) of the Koran (*q.v.*) are correct, the earliest revelations took the form of pages or rolls which the Prophet was to read by the “grace of God,” as Joseph Smith, the founder of the Mormon community, said of the power given him to read the “Egyptian” characters on the gold plates which he had found. The command to read is accompanied by the statement that “his most generous Lord had taught man by the pen (*calamus*) that which he did not know.” Waraqah, to whom the event is said to have been communicated by Khadija, called these communications “the Greater Law (*nomos*).” The Prophet was directed to communicate his mission at the first only to his nearest relatives. The utterances were from the first in a sort of rhyme, such as is said to have been employed for solemn matter in general, *e.g.* oracles or prayers. At an early period the production of a written communication was abandoned for oral communications, delivered by the Prophet in trance; their delivery was preceded by copious perspiration, for which the Prophet prepared (in accordance with instructions found in the Koran) by wrapping himself in a blanket. Trusty followers were instructed to take these utterances down, but the phenomena which accompanied their delivery at least in one case suggested imposture to the scribe, who apostatized in consequence. It is extraordinary that there is no reason to suppose that any official record was ever kept of these revelations; the Prophet treated them somewhat as the Sibyl did her leaves. This carelessness is equally astounding whether the Prophet was sincere or insincere.

If the matter afterwards collected in the Koran be genuine, the early revelations must have been miscellaneous in content, magical, historical and homiletic. To some strange oaths are prefixed. Apparently the purpose to be compassed was to convince the audience of their miraculous origin. The formulation of doctrines belongs to a later period and that of jurisprudence to the latest of all. In that last period also, when Mahomet was despot of Medina, the Koran served as an official chronicle, well compared by Sprenger to the leading articles on current events in a ministerial organ. Where the continuous paragraph is substituted for the ejaculation, the divine author apologizes for the style.

Certain doctrines and practices (*e.g.* washing of the person and the garments) must have been enjoined from the first, but our authorities scarcely give us any clear notion what they were. The doctrines to which the Prophet himself throughout assigned most value seem to have been the unity of God and the future life, or resurrection of the body. The former necessitated the abandonment of the idolatrous worship which formed part of the daily life of Mecca, and in which Mahomet and Khadija had been accustomed to take their part. Yet it seems to have been due to the initiative of the proselytes themselves rather than to the Prophet’s orders that the Meccan worship was actually flouted by them; for the anecdote which represents the Prophet and his

young cousin attempting to pull down the images in or about the Ka'ba appears to be apocryphal. The first Moslem ceremony would appear to have been the religious meeting for the purpose of hearing the delivery of revelations, of which after the Prophet's death the sermon (*khuṭbah*) took the place. After various provisional meeting-places, the house of one al-Arqam on Mt. Safa was adopted for this purpose; and here proselytes were initiated.

Growth of the Early Community.

The names which the new community received from its founder are both philological puzzles; for the natural sense of Moslem (*Muslim*) appear to be "traitors," and to this a contemporary war-song of Mahomet's enemies alludes; while *Ḥanīf* (especially applied in the Koran to Abraham) seems to be the Hebrew word for "hypocrite." The former is explained in the Koran to mean "one who hands over his face or person to God," and is said to have been invented by Abraham; of the latter no explanation is given, but it seems to signify from the context "devotee." Since the divine name *Raḥmān* was at one time favoured by Mahomet, and this was connected with one Maslama of the tribe Ḥanīfa, who figures in politics at the end of Mahomet's career but must have been a religious leader far earlier, it has been suggested that the names originally belonged to Maslama's community. The honour of having been Mahomet's first convert is claimed for three persons: his wife Khadīja, his cousin Ali, who must have been a lad at the commencement of the mission, and Abū Bekr, son of Abū Quḥāfah, afterwards Mahomet's first successor. This last person became Mahomet's *alter ego*, and is usually known as the *Ṣiddiq* (Heb. word signifying "the saint," but to the Arabs meaning "faithful friend)". His loyalty from first to last was absolutely unswerving; he was selected to accompany Mahomet on the most critical occasion of his life, the Flight from Mecca; Mahomet is said to have declared that had he ever made a confidant of any one, that person would have been Abū Bekr; implying that there were things which were not confided even to him. The success of the Prophet's enterprise seems to have been very largely due to the part played by this adherent, who possessed a variety of attainments which he put at Mahomet's service; who when an intermediary was required was always ready to represent him, and who placed the commendation of the Prophet above every other consideration, private or public. The two appear to have regularly laid siege to those persons in Mecca whose adherence was desirable; and the ability which many of the earlier converts afterwards displayed, whether as statesmen or generals, is a remarkable testimony to their power of gauging men. It seems clear that the growth of wealth in Mecca had led to the accentuation of the difference between persons of different station, and that many were discontented with the oligarchy which governed the city. Converts could, therefore, be won without serious difficulty among the aliens and in general those who suffered under various disqualifications. Some members of the Jewish community seem also to have joined; and some relics of the Abyssinian expedition (*i.e.* descendants of the invaders). Among the most important converts of the Meccan period were Mahomet's uncle Ḥamza, afterwards for his valour called "the Lion of God"; 'Abd al-Raḥman (Abdar-raḥman) son of 'Auf; Othman, son of 'Affān, who married two of the Prophet's daughters successively, and was Mahomet's third successor; and, more important than any save Abū Bekr, Omar, son of al-Khattāb, a man of extraordinary force of character, to whom siege seems to have been laid with extraordinary skill. At some time he received the honourable title *Fārūq* ("Deliverer"); he is represented as regularly favouring force, where Abū Bekr favoured gentle methods; unlike Abū Bekr, his loyalty was not always above suspicion. His adherence is ascribed to the period of publicity.

The secrecy which marked its early years was of the greatest value for the eventual success of the mission; for when Mahomet came forward publicly he was already the head of a band of united followers. His own family appear to have been either firm adherents, or violent enemies, or lukewarm and temporizing—this is the best which can be said for 'Abbās, eponymus of the Abbasid dynasty; or finally espousers of his cause, on family grounds, but not as believers.

First Period of Publicity.

Rejecting accounts of Mahomet's first appearance as a public preacher, which are evidently comments on a text of the Koran, we have reason for supposing that his hand was forced by ardent followers, who many times in his career compelled him to advance. The astute rulers of the community perceived that the claim made by Mahomet was to be dictator or autocrat; and while this was naturally ridiculed by them, some appear to have been devoted adherents of the gods or goddesses whom he attacked. The absence of dated documents for the period between this open proclamation (which in any case commenced before 616) and the Flight to Medina in 622 renders the course of events somewhat conjectural, though certain details appear to be well established. Apparently there was a war of words, followed by a resort to diplomacy and then to force; and then a period in which Mahomet's attention was directed to foreign conversions, resulting in his being offered and accepting the dictatorship of Yathrib.

Of the war of words we have an imperfect record in the Meccan suras of the Koran, which occasionally state the objections urged by the opponents. In the course of the debate the theological position of both parties seems to have shifted, and the knowledge of both was probably increased in various ways. The miracle of the Koran, which at first consisted in its mode of production, was transformed into a marvel connected with its contents; first by Mahomet's claiming to tell historical narratives which had previously been unknown to him; afterwards by the assertion that the united efforts of mankind and Jinn would be unable to match the smallest passage of the Koran in sublimity. Probably the first of these claims could not be long maintained, though A. J. Davis, "the Seer of Poughkeepsie," in our own time brought a similar one in regard to his *Principles of Nature*. Indeed both parties evidently resorted to external aid. To those who undertook to name the man who dictated stories of the ancients to Mahomet day and night, he replied that the individual whom they had in mind was a foreigner, whereas the Koran was in pure Arabic. This was obviously a quibble, for it was scarcely asserted that he delivered the matter dictated to him without alteration. The purity of the Arabic also appears to have been very questionable; for several expressions appear to be Ethiopic rather than Arabic, and the person whom the Meccans had in mind is likely to have been an Abyssinian Christian, since the Christian technicalities of the Koran are mainly derived from the Ethiopic Gospels and Acts. On one occasion when some questions suggested by learned foreigners had been propounded to the Prophet he required a fortnight's delay before the revelation which solved them came; the matter contained in his reply was certainly such as required research. His sources of information seem at all times to have been legendary rather than canonical; and the community which seemed to his opponents to agree best with his views was that of the Sabians or Mandaeans (*qq.v.*).

It has been suggested that Mahomet first threatened the Meccans with temporal punishment, and only when this threat failed to take effect resorted to the terrors of the Day of Judgment and the tortures of Hell; it seems however a mistake to distinguish between the two. These threats provided the Prophet with his most powerful sermons. The boasts of incomparable eloquence which the Koran contains are evidence that his oratorical power was effective with his audiences, since the more successful among the Arabic poets talk of their compositions somewhat in the same way. These discourses certainly led to occasional conversions, perhaps more frequently among women than men.

The Exiles in Axum.

The diplomatic war seems to have been due to the Prophet's increasing success, which led to serious persecution of Mahomet's less influential followers, though, as has been seen, no blood could be shed in Mecca. Abū Ṭālib, moreover, prevented him from being exiled, though he probably had to endure many personal insults. Something however had to be done for the persecuted Moslems, and (perhaps at the suggestion of his Abyssinian helper) Mahomet endeavoured to find a refuge for them in the realm of Axum. Abyssinia was doubtless connected in every Meccan mind with the "Expedition of the Elephant"; and such an alliance secured by Mahomet was a menace to the existence of the Meccan community. A deputation was therefore sent by the Meccan leaders to demand extradition of the exiles; and as chief of this expedition the future conqueror of Egypt, 'Amr b. al-'Āṣ (see 'Amr ibn el-Ass), first figures in history. To frustrate his efforts Mahomet sent his cousin Ja'far armed with an exposition of the Prophet's beliefs and doctrines afterwards embodied in the Koran as the Sura of Mary (No. XIX.; though with the addition of some anti-Christian matter). The original document contained an account of the Nativity of Christ with various miracles not known to either the canonical or even the apocryphal gospels which have been preserved, but which would be found edifying rather than unorthodox by a church one of whose most popular books is *The Miracles of the Virgin Mary*. To this there were added certain notices of Old Testament prophets. The Abyssinian king and his ecclesiastical advisers took the side of Mahomet and his followers, whom they appear to have regarded as persecuted Christians; and an attempt made probably by the astute 'Amr to embroil them with the Abyssinians on the difficult question of the Natures of Christ failed completely. There seems reason for thinking that the Abyssinian king contemplated bringing back the exiles by force, but was diverted from this purpose by frontier wars; meanwhile they were safely harboured, though they seem to have suffered from extreme poverty. The want of an Abyssinian chronicle for this period is a serious disadvantage for the study of Islamic origins. The sequel shows that regular correspondence went on between the exiles and those who remained in Mecca, whence the former were retained within the fold of Islam, with occasional though rare apostasies to Christianity.

Mahomet's diplomatic victory roused the Meccan leaders to fury, and they decided on the most vigorous measures to which they could rise; Abū Ṭālib, Mahomet's protector, and the clan which acknowledged him as *sheikh*, including the Prophet and his family, were blockaded in the quarter which they occupied; as in other sanctuaries, though blood might not be shed, a culprit might be starved to death. That this did not occur, though the siege appears to have lasted some months at least, was due to the weak good nature of the Meccans, but doubtless also to the fact that there were enlisted on Mahomet's side many men of great physical strength and courage (as their subsequent careers proved), who could with impunity defy the Meccan embargo. After a time however the besieged found the situation intolerable, and any assistance which they might have expected from the king of Axum failed to come. The course adopted by Mahomet was retractation of those of his utterances which had most offended the Meccans, involving something like a return to paganism. A revelation came acknowledging the effectiveness of the Meccan goddesses as well as Allah, and the Meccans raised the siege. News of the reconciliation reached the Abyssinian exiles and they proceeded to return.

By the time they reached the Arabian coast the dispute had recommenced. The revelation was discovered to be a fabrication of the Devil, who, it appears, regularly interpolates in prophetic revelations; such at least is the apology preserved in the Koran, whence the fabricated verses have been expunged. Since our knowledge of this episode (regarded as the most disgraceful in the Prophet's career) is fragmentary, we can only guess that the Prophet's hand had once more been forced by the more earnest of his followers, for whom any compromise with paganism was impossible. The exiles went back to Abyssinia; and about this time both Abū Ṭālib and Khadīja died, leaving the Prophet unprotected.

He fled to the neighbouring oasis of Ṭāif, where wealthy Meccans had possessions, and where the goddess al-'Uzza was worshipped with special zeal—where she is said still to exist in the form of a block of stone. He had but little success there in proselytizing, and indeed had to cease preaching; but he opened negotiations with various Meccan magnates for a promise of protection in case of his return. This was at last obtained with difficulty from one Moṭ'im b. 'Adi. It would appear that his efforts were now confined to preaching to the strangers who assembled at or near Mecca for the ceremonies connected with the feasts. He received in consequence some invitations to come and expound his views away from Mecca, but had to wait some time before one came of a sort which he could wisely accept.

The Flight to Yathrib.

The situation which led to Mahomet's Flight (*hijra*, anglicized incorrectly *hejira*, *q.v.*) was singularly favourable to Mahomet's enterprise, and utilized by him with extraordinary caution and skill. At the palm plantation called Yathrib, afterwards known as *al-Medina*, Medina, "the City" (*i.e.* of the Prophet), there were various tribes, the two most important, called Aus and Khazraj, being pagan, and engaged in an internecine feud, while under their protection there were certain Jewish tribes, whose names have come down to us as Qainuqā, Naḍīr and Quraiza—implying that the Israelites, as might be expected, imitated the totem nomenclature of their neighbours. The memory of these Israelites is exclusively preserved by the Moslem records; the main stream of Jewish history flowed elsewhere. In the series of combats between the Aus and Khazraj the former had generally been worsted; the Jews, as usual, had avoided taking any active part in the fray. Finally, owing to an act of gross perfidy, they were compelled to fight in aid of the Aus; and in the so-called battle of Bu'āth the Aus aided by the Jews had won a victory, doubtless attributed to the God of the Jews. As has been seen, the divine name employed by Mahomet (*Raḥmān*) was one familiar to the Jews; and the Yathribites who visited Mecca at feast-time were naturally attracted by a professed representative of al-Raḥmān. The first Yathribite converts appear to have been Khazrajites, and one As'ad, son of Zurarah, is the most prominent figure. Their idea may have been in

the first place to secure the aid of the Israelitish Deity in their next battle with the Aus, and indeed the primary object of their visit to Mecca is said to have been to request assistance for their war. For this the plan was substituted of inviting the Prophet to come to Mecca as dictator, to heal the feud and restore order, a procedure to which Greek antiquity offers parallels. The new converts were told to carry on secret propaganda in Yathrib with this end in view. At the next feast some of the rival faction embraced Islam. A trusty follower of Mahomet, Mus'ab b.'Umair, who resembled Mahomet in personal appearance, was sent to Yathrib to assist in the work. The correspondence between this person and the Prophet would, if we possessed it, be of the greatest value for the study of Islamic antiquity. We first hear at this time of *the conditions of Islam*, *i.e.* a series of undertakings into which the convert entered: namely, to abstain from adultery, theft, infanticide and lying, and to obey Mahomet *in licitis et honestis*. The wholesale conversion of Yathrib was determined by that of two chieftains, Usaid b. Ḥuraith and Sa'd b. Mu'adh, both Ausites. The example of these was quickly followed, and iconoclasm became rife in the place. At the next Meccan feast a deputation of seventy Yathribites brought Mahomet a formal invitation, which he accepted, after imposing certain conditions. The interviews between Mahomet and the Yathribites are known as the *'Aqabah* (probably with reference to a text of the Koran). The attitude of the Jews towards the project appears to have been favourable.

Among the conditions imposed by Mahomet on his new adherents appears to have been the protection and harbouring of the older proselytes, whom Mahomet most wisely determined to send before him to Yathrib, where, in the event of the Yathribite loyalty wavering, they could be counted on with certainty. The welcome given these refugees (*muhājirūn*), as they were from this time known in contra-distinction to the helpers (*anṣār*) or allies from Yathrib, is said to have been of the warmest; a Helper with two wives would hand one over to a wifeless Refugee. A yet more important condition which preceded the Flight was readiness to fight men of all colours in defence of the faith.

The Refugees.

Although the transactions with the people of Yathrib had been carried on with profound secrecy, the nature of Mahomet's contract with his new adherents was somewhat divulged to the Meccan magnates, and the danger of allowing an implacable enemy to establish himself on the high-road of their north-bound caravans flashed upon them. The rule which forbade bloodshed in the sacred city had at last to be suspended; but elaborate precautions were to be taken whereby every tribe (except Mahomet's own clan) should have their share in the guilt, which would thus be spread over the whole community fairly. When the committee appointed to perpetrate the crime reached Mahomet's house, they found that it was too late; Mahomet had already departed, leaving Ali in his bed.

The actual Flight from Mecca to Yathrib has naturally been a favourite subject for romance, and indeed appears to have been executed with the greatest cunning. Accompanied by Abū Bekr only, Mahomet took refuge in a cave of Mt Thaur, in the opposite direction to that which he intended to take finally, and there remained for three days; provision had been made of every requisite, food, powerful camels, a trusty and competent guide. The date at which he reached Kuba, on the outskirts of Yathrib, where there was already some sort of Moslem oratory, is given as 8 Rabia I., of the year A.H. 1; the fact that he arrived there on the Jewish Day of Atonement gives us the date September 20, 622. The Meccans, who had employed professional trackers to hunt down the fugitives, proceeded to confiscate the houses and goods of Mahomet and of his followers who had fled.

The safe arrival of Mahomet at his destination marks the turning-point in his career, which now became one of almost unbroken success; his intellectual superiority over both friends and enemies enabling him to profit by defeat little less than by victory. His policy appears to have been to bind his followers to himself and them to each other by every possible tie; he instituted brotherhoods between the Refugees and Helpers, which were to count as relationships for legal purposes, and having himself no sons, he contracted numerous marriages partly with the same end in view; *e.g.* with the infant daughter of Abū Bekr, Ayesha ('A'ishah), whose ability he appears to have discerned; and the unamiable Ḥafṣa, daughter of Omar. Of his own daughters three were given to faithful allies, the one by whom his line is supposed to have been continued to our time, Fāṭima, was reserved for his cousin Ali. Owing to his efforts the alliance between the Refugees and Helpers resisted numerous attempts on the part of enemies to break it up, and only towards the end of the Prophet's life, when he appeared to favour Meccans unduly, do we hear of any bitterness between the two communities.

Mahomet as Despot of Yathrib.

The population of Yathrib, or, as it may now be called, Medina, soon divided into three groups: Mahomet's united followers; the Jews; and a party known as the "Hypocrites," *i.e.* professing Moslems, who were lukewarm, or disaffected, among whom the most prominent is 'Abdallah b. Ubayy, a Khazrajite chieftain, who is said to have himself aspired to be despot of Yathrib, and who till nearly the end of Mahomet's career figures somewhat as a leader of the opposition; of his importance there is no question, but the reason for it and the mode whereby he made it felt are often obscure. It would seem that the pagans remaining in Yathrib speedily adopted Islam after the Prophet's arrival, whence we hear little of serious opposition on their part. Coming in the capacity of prophet of the Israelitish God, Mahomet at first seems to have courted alliance with the Jews, and to have been ready to adopt their system with very slight modifications—similar to those which, according to his opinion, Jesus had come to introduce. The Jews met these advances by submitting him to examination in the intricacies of the *Torah*, and, finding him very poorly equipped, proceeded to denounce him as an imposter; one of his examiners is said to have even translated the *Torah* into Arabic with a view of convicting him of ignorance and imposture. They are' further charged with exercising their magical arts on the Prophet and his followers, and to have succeeded thereby in producing barrenness among the Moslem women. Their conduct must not of course be judged by the statement of their enemies; it is however clear that Mahomet soon found that there was no possibility of compromising with them on religious questions, or of obtaining their loyal support; meanwhile he discovered that they were incapable of united and persistent action, and useless as warriors except against each other. He therefore resolved on their extermination. His ruthlessness in their case compared with his patience and forbearance in the case of the "Hypocrites" was consistent with his principle (always faithfully observed) that no inquiry was permissible into the motives of conversion, and with his division of mankind into the two antagonistic factions Believers and Unbelievers. The latter principle, as will

The Medina Community.

be seen, was somewhat modified before the end of his life.

Mahomet's failure to effect a compromise with the Jews caused a reaction in his mind towards paganism, and after about a year's residence at Medina the direction of prayer, which had till then been towards Jerusalem, was turned southward to the pagan temple at Mecca. With this change we may perhaps couple the adoption of the name *Allah* for the Deity; in the Moslem formula "in the Name of Allah the Raḥmān the Merciful," the translation attached to the word *Raḥmān*, and the prefixing to it of the name *Allah* furnish clear evidence of theological transition, though the stages are not recorded; we know, however, that the Meccans approved of the name *Allah*, but objected to the name *Raḥmān*. Prayer (*ṣalāt*), said to have been prescribed on the occasion of the Prophet's ascent into heaven after a miraculous journey from Mecca to Jerusalem, began to assume a stereotyped form in the place of assembly built by Mahomet immediately after his arrival; the attitudes of prayer in use among many communities (*e.g.* the Jewish standing, the prostration of some Christian sects) were combined. In general it was Mahomet's principle, while taking over a practice from some other sect, to modify it so as to render the Moslem method absolutely distinct; thus when a summons to prayer became requisite, a new mode (by the voice of a crier called *muaddhin* or *muezzin*) was preferred to the Christian hammer; a new sacred day was adopted, in lieu of the Jewish Saturday and the Christian Sunday, in the weekday on which he had safely reached Kuba, Friday; but the sanctity was reduced to the actual time occupied by public worship. On the subject of food he was satisfied with the regulations of the Council of Jerusalem, recorded in Acts xv.; which were observed by few if any Christian sects. The prohibition of wine, which was enacted in A.H. 3, is said to have been occasioned by the riotous conduct of one of his followers when under the influence of liquor; Palgrave saw in it (perhaps with justice) a deliberate attempt to prevent harmony between Moslems and Christians, in whose most sacred rite wine is used. The Fast of Ramaḍān, in which food both liquid and solid is forbidden from sunrise to sunset, is said to be a pagan or semi-pagan institution; its importance for military training and discipline is not likely to have been overlooked by the Prophet. When the direction of prayer was altered, it is probable that Mahomet already intended to introduce into his system the whole of the pagan pilgrimage with its antique ceremonial (with, of course, a new interpretation); before this he is supposed to have aimed at the abolition of the Ka'ba and all that appertained to it.

Development of Islam.

The difference between religious and civil law has never been recognized by Islamic jurists, whose manuals deal equally with the law of contract and the amount of the body to be washed before prayer; the Prophet's ordinances on both subjects were suggested by the occasion in each case, and it would seem that the opinions of trusted advisers were regularly heard before a revelation was issued. Even when this had been done the ordinance might be cancelled by an abrogating revelation; it being "easy for Allah" to substitute for a text already revealed another that was better or at least as good.

As Islam began to spread outside the limits of Medina both conversion to Islam and persistence therein were reduced to simple tests; the pronunciation of the double formula of belief in Allah and Mahomet was sufficient to indicate conversion, whilst payment of an income-tax, called by the Jewish names for alms (*zakāt* and *ṣadaqah*), was evidence of loyalty. This income-tax, of which the definite assessment perhaps belongs to a later period, was for the support of necessitous converts—an element in the community whose presence accounts for the mode in which the development of the Islamic state proceeded.

The industries in which the Meccan Refugees had been engaged were not of a sort which they could exercise at Medina, where the palm took the place of the camel as the basis of society. Moreover the Prophet seems to have given some disastrous advice on the subject of palmiculture, and thereby to have accentuated the poverty of the place. He had, therefore, to find some fresh source of revenue in order to deal with this difficulty, and one of the Helpers is said to have suggested the plan which he adopted, viz. of attacking the Meccan caravans. With this view he organized a series of expeditions, taking the lead himself sometimes, while at others he gave it to one of his veteran followers; and at first only Refugees took part in them. The leaders of the caravans, however, were expert in evading attacks of this sort, which were doubtless regularly attempted by the desert tribes; and in the first year of his despotism Mahomet did not score a single success of the kind intended. The attempts were not wholly fruitless; for while on the one hand he accustomed his followers to campaigning, on the other he made a series of agreements with the chieftains of the tribes through whose territory the caravans ordinarily passed. Finding continued failure intolerable, he resolved to take advantage of his power to bind and to loose by sending an expedition of seven men under his cousin 'Abdallah b. Jaḥsh to attack a caravan at the beginning of the sacred month Rajab, when, as raiding during such a season was unknown, success was practically certain. The commander on this, the Nakhlah raid, was given sealed orders, to be opened after two days' march; the men were then to be given the option of retiring, if they disapproved. Of this no one seems definitely to have availed himself, and the raid ended successfully, for considerable booty was captured, while of the four persons who escorted the caravan two were made prisoners, one escaped, and one, 'Amr b. al-Ḥaḍrami, was killed; he was the first person slain fighting against an Islamic force. The violation of the sacred month seems to have caused considerable scandal in Arabia, but led to no serious consequence; on the other hand the shedding of blood created a feud between the people of Mecca and the Refugees, with whom the Meccans long declined to identify the people of Medina. The fact that the man who had been killed was a client, not a citizen, made no difference. The circumstance that booty had been actually acquired appears to have helped the Prophet's cause very considerably.

First Campaigns of Mahomet.

Both these consequences, the Meccan desire to avenge the blood that had been shed and the anxiety of the Medinese to take part in a successful raid, manifested themselves a few months later, when an expedition was organized by Mahomet to attack a caravan returning from Syria, which had escaped him the previous year. Many desired to take part in the raid, and finally some 300 persons were selected, including a large number of "Helpers." The leader of the caravan learned somehow that an attack was being organized by Mahomet on a large scale, and sent to Mecca for aid, while hurrying home by forced marches. This is the first historical appearance of Abū Sofiān (the leader of the caravan), who now for some years played the part of president in the Meccan opposition to Mahomet, and whose son was destined to found the second Mahommedan dynasty (see Caliphate, B). The day before the battle to be fought at Badr, near the point where the northern road leaves the coast to turn

Attack on Meccan Caravan.

eastwards to Mecca, the Moslem army learned that the Meccan succour (some 1000 strong) was near, but that the caravan had escaped. The Meccans, it is asserted, would have returned home now that their object was secured, but the patrons of the man who had been killed in the former raid were compelled to strike for vengeance.

The battle (Ramaḍān 19, A.H. 2, usually made to synchronize with March 17, 624) ended in a complete victory for Mahomet, whose followers killed seventy of the enemy and took seventy prisoners—if we may trust what seem to be round numbers; it was attributed by him to divine co-operation, taking the form of an illusion wrought on the enemy, and the despatch of a regiment of angels to the assistance of the Believers, while on the other hand the treachery of the Devil did mischief to the Meccans. The popular tradition attributed it to the prowess of some of Mahomet's followers, especially his uncle Ḥamza and his cousin Ali. In the narratives which have come down and which seem to be authentic the result is amply accounted for by the excellence of the Moslem discipline and the complete absence of any on the Meccan side. Mahomet himself is said to have fainted at the first sight of blood, and to have remained during the battle in a hut built for him to which swift camels were tied, to be used in case of a defeat; yet these accounts make him responsible for the tactics, whilst assigning the credit for the strategy to one Ḥobab b. al-Mondhir. Several of Mahomet's old enemies and friends of Meccan days perished on this occasion; notably one Abu Jahl, his uncle, but represented as an implacable enemy; another hostile uncle, Abu Lahab, who is cursed in the Koran, was not present but died shortly after the battle.

The day is called in the Koran by a Syriac expression the "Day of Deliverance," and both for internal and external politics it was of incalculable advantage to Islam. The booty and the ransoms of the prisoners provided the means for dealing with distress; the story of supernatural aid soothed the feelings of the defeated Meccans and had a tendency to disarm resistance elsewhere; whilst Mahomet in the popularity acquired by his victory was able to strike forcibly at his enemies in Medina. One of the sequels to the victory was a series of assassinations whereby critics of his actions were removed.

The defeat at Badr naturally led to efforts on the part of the Meccans to avenge their dead and besides to secure the commerce, by which they lived, from an enemy who was gradually getting all the seaboard that lay between Jeddah and Yanbo within his sphere of influence; and the year after Badr (A.H. 3) Abū Sofiān was able to lead a force said to be three times as great as that which had been defeated, and so numbering some 3000 men, against Medina itself; part of it was under Khālid b. al-Walid, one of the greatest of Arab captains, afterwards conqueror of Syria. It is said that Mahomet's plan was to remain in Medina itself, and leave it to the Meccan commander to discover some way of taking the place; but that his hand was forced by his more ardent followers. Others, however, assign this advice to Abdallah b. Ubayy, and make the Prophet anxious to fight from the first. A battle was in consequence fought under Mt Uḥud (or Ohod), north-west of Medina, wherein Khālid succeeded in inflicting a severe defeat on Mahomet's forces; his uncle Ḥamza, hero of Badr, was killed on this occasion. Fortunately for the Moslems, the Meccans considered that they had finished their task when they discovered that they had killed a number of the former equal to those who had fallen at Badr on their own side; instead therefore of pursuing their victory they went home. The immediate effect on Arabia appears to have been to dissipate the illusion that the Prophet could count on supernatural assistance in his wars; and we hear of some blows being dealt him from outside. Meanwhile his relations towards the Medinese Jews had grown more and more hostile, and these are credited with doing their best to rouse the Meccans to a sense of the danger which threatened them in the continuance of the Prophet's power, and in general to stir up hostility against him in Arabia. Whether this part was played by them or not, in the fifth year of the Prophet's stay at Medina a fresh invasion of the territory took place by a vast confederate force of Meccans with their allies, the tribes Fazarah, Asad, Murrah, &c., to the number, it is said, of 10,000. This time the intention of the leaders was undoubtedly to stamp out Islam. For the first time in Arab warfare Mahomet resorted to the expedient of defending his city by a trench, called by a Persian name, and suggested by a Persian convert. But he also employed agents to sow dissension among the confederates, and succeeded with this no less than with the other expedient. After a brief stay, and scarcely striking a blow, the confederacy dispersed, leaving the Jews who still remained in Medina to the summary vengeance of the Prophet. The want of records written from the Meccan standpoint renders the abortiveness of this last attempt at storming the Prophet's stronghold scarcely intelligible.

The Taking of Mecca.

From this time, however, the road towards the eventual taking of Mecca became easy, and we are told that such was the importance attached to that city throughout Arabia that its acquisition meant for the Prophet the acquisition of the whole peninsula. The next year (A.H. 6) he deemed it advisable to make a truce with the Meccans (the Truce of Ḥodaibiyah), whereby he secured for his followers the right of performing the pilgrimage in the following year; on this occasion he even consented to forgo his title "Prophet of Allah," when the Meccans refused to sign a deed in which it was employed, greatly to the scandal of his more earnest followers, including Omar; they were however too deeply committed to Islam to be able to defy the Prophet. When the pilgrimage was performed (A.H. 7), Mahomet not only won important converts in the persons of Khālid and the no less able 'Amr b. al-'Aṣ, but in general impressed the population with the idea that his was the winning side. An excuse was easily found for invading Mecca itself in the following year, when Abū Sofiān took the opportunity of embracing Islam before it was too late. Very little resistance was now made by the Meccans, whose chiefs were already in Mahomet's camp, and Mahomet used his victory with great moderation; his proscription list was finally reduced to two. The theory that all offences were cancelled by conversion was loyally observed. Moreover the Prophet incurred the displeasure of his Medinese friends by the anxiety which he displayed to soothe the feelings of his former enemies and antagonists. The Medinese, however, prevailed upon him to maintain their city as his political capital, while making Mecca the religious centre of his system; and this arrangement accounts perhaps more than anything else for the persistence of the system amid so many dynastic changes.

In the main he appears to have introduced little alteration into the government of Mecca, and it is said that he even declined to retaliate on those who had confiscated the possessions of the Refugees. Even the Ka'ba was left in the keeping of its former custodian, though of course its interior as well as its precincts were cleansed of all that could offend monotheists. In the following year the pilgrimage was for the first time conducted by a Moslem official, Abū Bekr. A proclamation was made on that occasion, forbidding idolaters in

future to take part in the pilgrimage, and giving all Arabs who were not as yet converted four months' grace before force was to be brought to bear upon them. In the following year Mahomet conducted the Pilgrimage himself. This solemn occasion (the "Farewell Pilgrimage") was also employed for the delivery of an important proclamation, wherein the Prophet declared that God had completed their religion. The principle whereon he specially insisted was the brotherhood of Islam; but there is some difficulty in enucleating the original sermon from later additions.

Conquest of Arabia.

It would seem that Mahomet's enterprise originally comprised the conversion of Mecca only, and that he thought of himself as sent to his fellow-citizens only, as had been the case with earlier prophets, whose message was for their "brethren." His views took a somewhat different direction after his brief exile to Ṭāif, and the conquest of Arabia was in a way forced upon him in the course of his struggle with the Meccans. It is not indeed perfectly clear by what process he arrived at the resolution to exclude paganism from Arabia; at first he appears to have tolerated it at Medina, and in some of his earlier contracts with neighbouring tribes he is represented as allowing it, though some of our texts make him reserve to himself the right of enforcing Islam if he chose; only the Meccans were at first, according to the most authentic documents, excluded from all truce or treaty. At the battle of Badr he appears to have formulated the rule that no one might fight on his side who had not embraced Islam; and when once he had won fame as a successful campaigner, those who wished to share his adventures had to pass the Islamic test. After the battle of Uhud (Ohod) we hear of a tribe demanding missionaries to instruct them in Islamic principles; and though in the case recorded the demand was treacherous, the idea of sending missionaries appears not to have been unfamiliar even then, albeit the number sent (70), if rightly recorded, implies that the Prophet suspected the good faith of the applicants. After the taking of Mecca, whereby the chief sanctuary at any rate of north Arabia had been cleared of all idolatrous associations, and consecrated to monotheism, paganism in general was conscious of being attacked; and the city had scarcely been brought under the new régime before the Prophet had to face a confederation of tribes called Hawāzin and Thaqīf. The battle which ensued, known as the Day of Honain, was near ending disastrously for Islam; some of Mahomet's sturdiest followers fled; but the terrible danger of a defeat in the neighbourhood of recently conquered Mecca roused the Prophet and Ali to heroism, and they saved the day. Emissaries were now sent far and wide demanding the destruction of idols, and only Ṭāif appears to have made any considerable resistance; against this place for the first time the Prophet made use of siege artillery, such as was employed by the Byzantines; though compelled by the bravery of the inhabitants to raise the siege, he was afterwards able to take the city by capitulation. It has been observed that here only do we read of much attachment to the old deities; in most places they were discarded with few regrets when once their impotence had been found out. After the taking of Mecca and the victory of Honain there appears to have been a general desire, extending even to the extreme south of Arabia, to make the best terms with the conqueror so soon as possible; iconoclasm became general. Flatterers of various kinds, including poets, came to seek the favour of the sovereign; and a mock war of words appears to have been substituted by some tribes for more serious fighting, to terminate in surrender. For warfare of his sort Mahomet had a powerful helper in the poet Ḥāssan b. Thābit, for whose effusions a pulpit was erected in the Medina mosque, and whose verses were said to be inspired by the Holy Spirit; though, as has been seen, Mahomet was not himself able to judge of their artistic merit. It was not, however, found easy to enforce the payment of the alms on these new converts; and this taxation caused an almost general revolt so soon as Mahomet's death had been ascertained.

Plan of World-conquest.

Although the central portions of the peninsula in Mahomet's time were practically independent, large portions of the north-west and south-east were provinces of the Byzantine and Persian empires respectively, whence any scheme for the conquest of Arabia would necessarily involve the conqueror in war with these great powers. The conquest of Persia is said to have been contemplated by the Prophet as early as A.H. 5, when the famous Trench was being dug; but it was not till the year A.H. 7, on the eve of the taking of Mecca, that the Prophet conceived the idea of sending missives to all known sovereigns and potentates, promising them safety if, but only if, they embraced Islam. The text of these letters, which only varied in the name of the person addressed, is preserved (doubtless faithfully) by the Moslem Oral Tradition; in the middle of the last century a French explorer professed to discover in Egypt the original of one of them—addressed to the mysterious personage called the Muqauqis (Muḳauḳis) of Egypt—and this, it appears, is still preserved amid other supposed relics of the Prophet in Constantinople, though there is little reason for believing it to be genuine. The anecdotes dealing with the reception of these letters by their addressees are all fabulous in character. Two appear to have sent favourable replies: the king of Axum, who now could send the exiles whom he had so long harboured to their successful master; and the Egyptian governor, who sent Mahomet a valuable present, including two Coptic women for his harem. The emperor Heraclius is claimed as a secret convert to Islam, on whom pressure had to be put by his advisers to conceal his convictions. The Persian king is said to have sent orders to have Mahomet arrested; his messengers arrived in Medina, but were unable to carry out the commands of their master, who died while they were there. Two of the letters are said to have had important results. One was addressed to the Himyarite chiefs (called by the south Arabian appellation *qail*) in Yemen, and effected their conversion; another to the governor of Bostra in Roman Arabia, who put the bearer of this insolent message to death; a force was despatched by Mahomet immediately afterwards (beginning of A.H. 8) to avenge this outrage; and though the Moslems were defeated in their first encounter with the Byzantine forces at Mutah, they appear to have given a good account of themselves; it was here that Ja'far, cousin of the Prophet, met his death. In A.H. 9 a successful expedition was led by the Prophet himself northward, in which, though no Byzantine force was encountered, a considerable region was withdrawn from the Byzantine sphere of influence, and made either Islamic or tributary to Islam. At the time of his death (of fever, after a short illness) he was organizing an expedition for the conquest of Syria.

Jewish and Christian Communities.

The Prophet claimed throughout that his revelation confirmed the Jewish and Christian Scriptures, and this claim is on the whole reasonable, though his acquaintance with both was in the highest degree vague and inaccurate. Still he reproduced the Old Testament as faithfully as he could, and though he patriotically endeavours to shed some lustre on his supposed ancestor Ishmael, he does not appear to have questioned the Biblical theory according to which the founder of the north Arabian nations was the son of a slave girl. On neither the truth of the Biblical history and

miracles nor the validity of the Mosaic legislation does he appear to have cast any doubt. He even allows that Israel was the chosen people. The Gospel was known to him chiefly through apocryphal and heretical sources, which cannot certainly be identified; but he accepted the doctrine of the Virgin-birth, the miracles of healing the sick and raising the dead, and the ascension; the crucifixion and resurrection were clearly denied by the sect from whom he had received his information, and rejected by him, though certainly not because of any miracle which the latter involved. His quarrel with the Jews at Medina appears to have been by no means of his own seeking, but to have arisen unavoidably, owing to his particular view of his office being such as they could not accept; and his attempt to discredit, not the Mosaic Law, but the form in which they presented it, was an expedient to which he resorted in self-defence. An attempt was made shortly after his arrival at Medina to settle the relations between the two communities by a treaty, according to which, while their equality was guaranteed there should be little interference between the two; this, however, was found unworkable, and each victory of Mahomet over the Meccans was followed by violent measures against the Medinese Israelites. When experience had shown him their military incompetence he appears to have been unable to resist the temptation to appropriate their goods for the benefit of his followers; and his attack on the flourishing Jewish settlement of Khaibar, after the affair of Ḥodaibiyah, appears to have been practically unprovoked, and designed to satisfy his discontented adherents by an accession of plunder. Yet the consciousness that this process was economically wasteful suggested to him an idea which Islamic states are only now abandoning, viz. that of a tolerated caste, who should till the soil and provide sustenance for the Believers who were to be the fighting caste. Whereas then his former plan in dealing with Israelites had been to banish or massacre, he now left the former owners of Khaibar (who had survived the capture of the place) in possession of the soil, of whose produce they were to pay a fixed proportion to the Islamic state. The same principle was adopted in the case of later conquests of Jewish settlements.

Disputes with Christians occur somewhat later in the Prophet's career than those with Jews, for neither at Mecca nor Medina were the former to be found in any numbers; individuals are likely to have been found in both cities, and we hear of one Medinese "Abu'Amir the Monk," who after Mahomet's arrival at Medina branded him as an impostor, and, going himself into exile, made many an abortive attempt to discredit and injure Mahomet's cause. The notices of him are meagre and obscure. Mahomet's manifesto to the world, about the time of the taking of Khaibar, appears to represent his definite breach with Christianity; and when in the "year of the embassies" the Christians of Najran sent a deputation to him, they found that the breach between the two systems was not to be healed. Of the three alternatives open to them—conversion, internecine war, and tribute, they chose the last. The Christian tribes of north Arabia showed greater inclination towards the first. The Prophet's policy was to give Christians lighter terms than Jews, and though the Koran reflects the gradual adoption by the Prophet of an attitude of extreme hostility to both systems, its tone is on the whole far more friendly to the former than to the latter. Some other communities are mentioned in the Koran, but merely in casual allusions: thus we know that Mahomet's sympathy was with the Byzantines in their struggle with Persia, but in his most tolerant utterance the Magians or Mazdians as well as the Sabians (with whom his followers were identified by the Meccans) are mentioned with respect.

Mahomet's Administration.

The financial requirements of Mahomet's state were of the simplest kind, for there is no trace of any form of governmental department having been instituted by him, even when he was master of the peninsula; nor can we name any permanent officials in his employ except his *muaddhin* Bilal, and perhaps his court-poet Hassān. A staff of scribes was finally required both to take down his revelations and to conduct correspondence; but although he encouraged the acquisition of penmanship (indeed some of the prisoners at Badr are said to have been allowed to ransom themselves by teaching it to the Medinese), we know of no regular secretaries in his employ. As despot of Medina he combined the functions of legislator, administrator, general and judge; his duties in the last three capacities were occasionally delegated to others, as when he appointed a governor of Medina during his absence, or leaders for expeditions, with provision for successors in case of their falling, but we hear of no permanent or regular delegation of them. Till near the end of his career at Medina he maintained the principle that migration to that city was a condition of conversion; but when, owing to the extension of his power, this was no longer practicable, his plan was in the main to leave the newly converted communities to manage their internal affairs as before, only sending occasional envoys to discharge special duties, especially instruction in the Koran and the principles of Islam, and to collect the Alms; quite towards the end of his life he appears to have sent persons to the provinces to act as judges, with instructions to judge according to the Koran, and where that failed, *the practice* (*sunna*), *i.e.* the practice of the community, for which a later generation substituted the practice of the Prophet. There were, therefore, no regular payments to permanent officials; and the taxation called *Alms*, which developed into an income-tax, but was at first a demand for voluntary contributions, was wholly for the support of the poor Moslems; it might not be used for the maintenance of the state, *i.e.* Mahomet and his family. For them, and for public business, *e.g.* the purchase of war material and gratuities to visitors, provision was made out of the booty, of which Mahomet claimed one-fifth (the chieftain's share had previously, we are told, been one-fourth), while the remainder—or at least the bulk of it—was distributed among the fighting men; the Prophet appears to have prided himself on the justice of his distribution on these occasions, and doubtless won popularity thereby, though we hear occasionally of grumbling; for difficulties occurred when a defeated tribe embraced Islam, and so could claim equality with their conquerors, or when portions of the spoil were irregularly employed by Mahomet to allay resentment: the persons whose allegiance was thus purchased were euphemistically termed "those whose hearts were united." What afterwards proved the main source of revenue in Islamic states dates from the taking of Khaibar; for the rent paid to the state by tolerated communities for the right to work their land developed long after Mahomet's time into a poll-tax for Unbelievers (see Caliphate, *e.g.* B. § 8 and Mahommedan Institutions), and a land-tax for all owners of land. Immediately after the taking of Khaibar certain communities, of which the most notable was Fadak, sent tribute before they had been attacked and reduced; their land was regarded by Mahomet as his private domain, but after his death it was withdrawn from his heirs by his successor Abū Bekr, in virtue of a maxim that Prophets left no inheritance, which in the opinion of Fāṭima was contrary to Koranic doctrine, and invented by Ayesha's father expressly for the purpose of excluding her and her husband from their rights; and this is likely to have been the case.

As a military organizer Mahomet, as has been seen, was anxious to adopt the most advanced of

contemporary methods, and more than once is said to have scandalized the Arabs by foreign innovations, as at a later time the Moslem chiefs who first used gunpowder scandalized their co-religionists. The unit in his armies seems to have been, as of old, the tribe, under its natural leader; that he introduced no more scientific division, and nothing like a hierarchy of officers was perhaps due to the difficulty of reconciling such a system with the equality of all Moslems.

As has been seen, the Koran only assumed the character of a civil code as the need for one arose; and for some time after Mahomet's arrival at Medina old-fashioned methods of settling disputes continued in use, and doubtless in accordance with precedent where such was known. For difficult cases, even in Arab opinion, divine inspiration was required; and since Mahomet naturally claimed to be in sole enjoyment of this, his utterances soon became the unique source of law, though he did not at first think of organizing a code. Such a plan is said to have occurred to him, and he even wished to dictate a code upon his deathbed; but his friends supposed or professed to suppose him to be delirious. A table regulating the "Alms" was left by him, it is said, in the possession of Abū Bekr; but other traditions assign another origin to this document.

Just as there were no regular officials for the arrangement of business, so there were none for its execution; when punishment was to be administered, any follower of Mahomet might be called upon to administer it. In the case of the massacre of the Banū Quraiẓah care was taken to see that some of the heads were struck off by their former allies, in order that the latter might be unable at any time to bring a demand for vengeance. The Prophet hoped by the mere terror of his name to make complete security reign throughout Arabia, and there is no evidence that any system of policing either it or even Medina occurred to him.

Domestic Life.

Until the death of Khadija the Prophet's private life seems to have been normal and happy, for though the loss of his sons in infancy is said to have earned him a contemptuous epithet, he was fortunate in his adoption of Zaid b. Ḥarithah, apparently a prisoner ransomed by Khadija or one of her relatives, who appears as dutiful almost to excess and competent in affairs. The marriages of his daughters seem all to have been happy, with, curiously, the exception of that between Fatima and Ali. His domestic troubles, to which an unreasonable amount of space seems to be devoted, even in the Koran, began after the Migration, when, probably in the main for political reasons, he instituted a royal harem. One of these political motives was the principle which long survived, that the conquest of a state was consummated by possession of the former monarch's wife, or daughter; another, as has been seen, the desire to obtain the securest possible hold on his ministers. In his marriage with the daughter of his arch-enemy Abū Sofiān, before the latter's conversion, we can see a combination of the two. Few, therefore, of these marriages occasioned scandal; yet public morality seemed to be violated when the Prophet took to himself the wife of his adopted son Zaid, whose name has in consequence the honour of mention in the Koran in the revelation which was delivered in defence of this act. Its purpose was, according to this, to establish the difference between adoptive and real filiation. Serious trouble was occasioned by a charge of adultery brought against the youthful favourite Ayesha, and this had to be refuted by a special revelation; the charge, which was backed up apparently by Ali, seems to have been connected with some deeper scheme for causing dissension between the Prophet and his friends. Yet another revelation is concerned with a mutiny in the harem organized by Omar's daughter Hafsa, owing to undue favour shown to a Coptic concubine (Mary, mother of a son called Ibrahim, who died in infancy; his death was marked by an eclipse, January 27, 632); and various details of factions within the harem are told us by Mahomet's biographers.

Of the members of this harem the only prominent one is Ayesha, married to the Prophet shortly after the Flight, when she had scarcely passed the period of infancy, but who appears to have been gifted with astuteness and ambition that were quite beyond her years, and who maintained her ascendancy over the Prophet in spite of the fact that many carping criticisms of his revelations are attributed to her. Some of this may have been due to the obligations (including pecuniary obligations) under which her father had laid Mahomet; but her reputation seems to have been greatly enhanced by the sending down of a revelation to exonerate her (A.H. 6), for which she thanked God and not the Prophet. Each accession to the harem rendered the building of a house or room necessary for the newcomer's accommodation; a fact in which Robertson Smith perhaps rightly saw a relic of the older system whereby the tent was the property of women. The trouble noticed above seems to have arisen from the want of a similar arrangement in the case of slave girls, with whom Mahomet's system permits cohabitation. When Mahomet, whether in consequence of the fatigue incurred by the "Farewell Pilgrimage," or, as others thought, by the working of some poison put into his food some years before by a Jewess of Khaibar, was attacked by the illness which proved fatal, it was to the house of Ayesha that he was transferred (from that of another wife) to be nursed; and he apparently died in the arms of the favourite, on whose statements we have to rely for what we know of his last hours.

General Characteristics.

The traditional description of Mahomet is "of middle height, greyish, with hair that was neither straight nor curly; with a large head, large eyes, heavy eyelashes, reddish tint in the eyes, thick-bearded, broad-shouldered, with thick hands and feet"; he was in the habit of giving violent expression to the emotions of anger and mirth. The supposition that he at any time suffered from physical weakness seems absolutely refuted by his career as a leader of difficult, dangerous and wearisome expeditions, from his migration to Medina until his death; indeed, during his last years he exhibited a capacity for both physical and intellectual activity which implies a high degree of both health and strength; and without these the previous struggle at Mecca could scarcely have been carried on. The supposition that he was liable to fits (epileptic or cataleptic) was intended to account for certain of the phenomena supposed to accompany the delivery of revelations; some of these however rest on very questionable authority: and the greater number of the revelations give evidence of careful preparation rather than spontaneity.

The literary matter ascribed to the Prophet consists of (1) the Koran (*q.v.*); (2) certain contracts, letters and rescripts preserved by his biographers; (3) a number of sayings on a vast variety of topics, collected by traditionalists. The references in the Koran to a form of literature called "Wisdom" (*ḥikmah*) suggest that even in the Prophet's time some attempts had been made to collect or at least preserve some of the last; the general uncertainty of oral tradition and the length of time which elapsed before any critical treatment of it was attempted, and the variety of causes, creditable and discreditable, which led to the wilful fabrication of prophetic utterances, render the use to which No. 3 can be put very limited. Thus the lengthy description of the journey to heaven which Sprenger was inclined to accept as genuine is regarded by most critics as a later fabrication. It is very much to be regretted that the number of *pièces justificatives* (No. 2) quoted by the

biographers is so small, and that for these oral tradition was preferred to a search for the actual documents, some of which may well have been in existence when the earliest biographies were written. Their style appears to have been plain and straightforward, though the allusions which they contain are not always intelligible.

In his personal relations with men Mahomet appears to have been able to charm and impress in an extraordinary degree, whence we find him able to control persons like Omar and Khalid, who appear to have been self-willed and masterful, and a single interview seems to have been sufficient to turn many an enemy into a devoted adherent. Cases (perhaps legendary) are quoted of his being able by a look or a word to disarm intending assassins.

Although the titles which he took were religious in character, and his office might not be described as sovereignty, his interests appear to have lain far more in the building up and maintenance of empire than in ecclesiastical matters. Thus only can we account for the violent and sudden changes which he introduced into his system, for his temporary lapse into paganism, and for his ultimate adoption of the cult of the Black Stone, which, it is said, gave offence to some of his sincere adherents (*e.g.* Omar), and seems hard to reconcile with his tirades against fetish-worship. The same is indicated by his remarkable doctrine that the utterance of the creed constituted a Moslem and not its cordial acceptance, and his practice of at times buying adhesion. Even an historian so favourable to the Prophet as Prince Caetani recognizes that ultimately what he regarded as most important was that his subjects should pay their taxes. And in general his system was not favourable to fanaticism (*al-ghulū fi'l-dīn*); he repeatedly gave permission for concealment of faith when the profession of it was dangerous; he took care to avoid institutions which, like the Jewish Sabbath, interfered seriously with military expeditions and the conduct of business, and permitted considerable irregularity in the matters of prayer and fasting when circumstances rendered it desirable. In his theory that Koranic texts could be abrogated he made wise provision against the danger of hasty legislation, though some of its usefulness was frustrated by his failure to provide for such abrogation after his death.

Mahomet's Reforms.

As has been seen, Mahomet claimed to introduce a wholly new dispensation, and a maxim of his law is that Islam cancels all that preceded it, except, indeed, pecuniary debts; it is not certain that even this exception always held good. Hence his system swept away a number of practices (chiefly connected with the camel) that were associated with pagan superstitions. The most celebrated of these is the arrow-game, a form of gambling for shares in slaughtered camels, to which poetic allusions are very frequent. More important than this was his attitude towards the blood-feud, or system of tribal responsibility for homicide (whether intentional or accidental), whereby one death regularly led to protracted wars, it being considered dishonourable to take blood-money (usually in the form of camels) or to be satisfied with one death in exchange. This system he endeavoured to break down, chiefly by sinking all earlier tribal distinctions in the new brotherhood of Islam; but also by limiting the vengeance to be demanded to such as was no more than the equivalent of the offence committed, and by urging the acceptance of money-compensation instead, or complete forgiveness of the offence. The remembrance of pre-Islamic quarrels was visited by him with condign punishment on those who had embraced Islam; and though it was long before the tribal system quite broke down, even in the great cities which rose in the new provinces, and the old state of things seems to have quickly been resumed in the desert, his legislation on this subject rendered orderly government among Arabs possible.

Next in importance to this is the abolition of infanticide, which is condemned even in early Suras of the Koran. The scanty notices which we have of the practice are not altogether consistent; at times we are told that it was confined to certain tribes, and consisted in the burying alive of infant daughters; at other times it is extended to a wider area, and said to have been carried out on males as well as females. After the taking of Mecca this prohibition was included among the conditions of Islam.

In the laws relating to women it seems likely that he regulated current practice rather than introduced much that was actually new, though, as has been seen, he is credited with giving them the right to inherit property; the most precise legislation in the Koran deals with this subject, of which the main principle is that the share of the male equals that of two females. Our ignorance of the precise nature of the marriage customs prevalent in Arabia at the rise of Islam renders it difficult to estimate the extent to which his laws on this subject were an improvement on what had been before. The pre-Islamic family, unless our records are wholly misleading, did not differ materially from the Islamic; in both polygamy and concubinage were recognized and normal; and it is uncertain that the text which is supposed to limit the number of wives to four was intended to have that meaning. The "condition of Islam" whereby adultery was forbidden is said to have been ridiculed at the time, on the ground that this practice had never been approved. Yet it would seem that certain forms of promiscuity had been tolerated, though the subject is obscure. Against these services we must set the abrogation of some valuable practices. His unfortunate essay in astronomy, whereby a calendar of twelve lunar months, bearing no relation to the seasons, was introduced, was in any case a retrograde step; but it appears to have been connected with the abrogation of the sanctity of the four months during which raiding had been forbidden in Arabia, which, as has been seen, he was the first to violate. He also, as has been noticed, permitted himself a slight amount of bloodshed in Mecca itself, and that city perhaps never quite recovered its sacrosanct character. Of more serious consequences for the development of the community was his encouragement of the shedding of kindred blood in the cause of Islam; the consequences of the abrogation of this taboo seem to have been felt for a great length of time. His assassinations of enemies were afterwards quoted as precedents in books of Tradition. No less unfortunate was the recognition of the principle whereby atonement could be made for oaths. On the question how far the seclusion of women was enjoined or countenanced by him different views have been held.

Sources.

Besides the contemporary documents enumerated above (Koranic texts, rescripts and authentic traditions) many of the events were celebrated by poets, whose verses were ostensibly incorporated in the standard biography of Ibn Isḥāq; in the abridgment of that biography which we possess many of these are obelized as spurious, and, indeed, what we know of the procedure of those who professed to collect early poetry gives us little confidence in the genuineness of such odes. A few, however, seem to stand criticism, and the *diwan* (or collection of poems) attributed to Ḥassan b. Thābit is ordinarily regarded as his. Though they rarely give detailed descriptions of events, their attestation is at times of value, *e.g.* for the story that the bodies of the slain at Badr were cast by the Prophet into a pit. Besides this,

the narratives of eyewitnesses of important events, or of those who had actually taken part in them, were eagerly sought by the second generation, and some of these were committed to writing well before the end of the 1st century. The practice instituted by the second Caliph, of assigning pensions proportioned to the length of time in which the recipient had been a member of the Islamic community, led to the compilation of certain rolls, and to the accurate preservation of the main sequence of events from the commencement of the mission, and for the detailed sequence after the Flight, which presently became an era (beginning with the first month of the year in which the Flight took place). The procedure whereby the original dates of the events (so far as they were remembered) were translated into the Moslem calendar—for something of this sort must have been done—is unknown, and is unlikely to have been scientific.

Mahomet's conduct being made the standard of right and wrong, there was little temptation to "whitewash" him, although the original biography by Ibn Isḥāq appears to have contained details which the author of the abridgment omitted as scandalous. The preservation of so much that was historical left little room for the introduction of miraculous narrations; these therefore either belong to the obscure period of his life or can be easily eliminated; thus the narratives of the Meccan council at which the assassination of Mahomet was decided, of the battles of Badr, Uḥud and Ḥonain, and the death of Sad'b. Mu 'adh, would lose nothing by the omission of the angels and the devil, though a certain part is assigned the one or the other on all these occasions. We should have expected biographies which were published when the 'Abbasids were reigning to have falsified history for the purpose of glorifying 'Abbās, their progenitor; the very small extent to which this expectation is justified is a remarkable testimony to their general trustworthiness.

Relatives of the Prohet[1]

1. *Family of 'Abd al-Moṭṭalib*, Mahomet's maternal grandfather:—*'Abbās (d. A.H. 32 or 34), *Ḥamza (d. A.H. 3), 'Abdallah, father of the Prophet, *Abū Ṭālib (said to be named 'Abd Manāf), ? *Zubair, Ḥārith, Ḥajal, Moqawwam, Ḍirār, *Abū Lahab (said to be named 'Abd al-'Uzzā, d. A.H. 2), **Ṣafiyyah* (d. A.H. 20), *Umm Ḥakīm*, *al-Baiḍā*, *'Ātikah*, *Umaimah*, *Arwā*, *Barrah*. 410

2. *Family of Abū Tālib*:—*'Aqīl (d. after A.H. 40), *Ja'far (d. A.H. 8), Ṭālib, Ṭulaiq, 'Alī, the caliph, *Umm Hāni'*, *Jumānah*, *Raiṭah*.

3. *Family of Mahomet. Wives*:—**Khadīja* (Children:—Qāsim; ? 'Abd Manāf (Ṭāhir, Tayyib); **Zainab* m. Abu'l-'Ās b. Rabī', d. A.H. 7; **Ruqayyah*, m. 'Othmān b. 'Affān, d. A.H. 2; **Umm Kulthūm* m. 'Othmān b. 'Affān, d. A.H. 9; **Fāṭimah*, m. 'Alī, d. A.H. 11): **Saudah bint Zam'ah*,? d. A.H. 54, **'A'ishah (Ayesha) bint Abī Bekr* (d. A.H. 56), **Hafṣa bint 'Omar* (d. A.H. 45 or 47), **Zainab bint Khuzaimah*, d. before A.H. 11, **Zainab bint Jaḥsh*, d. A.H. 20, **Umm Salimah*, d. A.H. 59, **Maimūnah*, d. A.H. 38, **Juwairiyah*, d. A.H. 56, **Umm Ḥabībah Ramlah bint Abī Sofiān*, d. A.H. 44.

Concubines:—**Ṣafiyyah bint Ḥuyyay*, d. A.H. 36, **Raiḥānah bint Zaid*, **Māriyah the Copt*, d. A.H. 15 or 16, mother of Ibrāhim. (Other names given by Ibn Sa'd, vol. viii.)

Chronological Table of Chief Events in the Life of Mahomet.[2]

? 570 Birth.

? 595 Marriage with Khadīja.

? 610 Commencement of call.

? 613 Public appearance. 616 Persian conquest of the nearer East.

? 617 Flight of his followers to Abyssinia.

? 618-619 Siege in Mecca. Retractation and subsequent repudiation. Death of Abū Talīb and Khadija.

? 620 Flight to Ṭāif.

622 July 16. Beginning of the Moslem era. Sept. 20. Arrival at Kuba after the Flight.

632 Jan. 27. Death of his son Ibrāhīm.

632 June 7. Death of Mahomet.

The following dates are given by the Arabic historians according to their own calendar. For the reasons which have been seen it is impossible to obtain certain synchronisms.

A.H.

2. Rajab 1. Raid of 'Abdallah b. Jaḥsh to Nakhlah.
Ramaḍān 19. Battle of Badr.
Shawwāl 15. Attack on the Banū Qainuqā.

3. Rabīa I. 14. Assassination of Ka'b b. al-Ashraf.
Shawwāl 7. Battle of Uḥud.

4. Ṣaphar. Massacre of Mahomet's 70 missionaries at Bi'r Ma'ūnah.
Rabīa I. Attack on the Banu Naḍīr.
Dhu'l-Qa'da. Abortive raid called "the lesser Badr."

5. Shaabān 2. Attack on the Banu'l-Muṣṭaliq (according to Wāqidī).
Dhu'l-Qa'da. Battle of the Trench.
Massacre of the Banū Quraiẓah.

6. Jomādā i. Capture of a caravan by Zaid b. Ḥārithah.
Futile attempt to assassinate Abū Sofiān.
Dhu'l-Qa'da. Affair of Ḥodaibiyah.

7. Jomādā i. Taking of Khaibar. Mission extended to the world.
Dhu'l-Qa'da. Pilgrimage to Mecca (called *'umrat al-qaḍiyyah*)

8. Jomādā i. Expedition to Mūtah.

Ramaḍān 20. Taking of Mecca.
Shawwāl. Battle of Ḥonain.
Attack on Ṭā'if.

9. Muḥarram. Tax-gatherers sent over Arabia.
Rajab. Expedition to Tabūk.
Rival Mosque built at Kubā, destroyed on Mahomet's return to Medina.
Dhu'l-Ḥijja. Pilgrimage conducted by Abu Bekr.
Abolition of idolatry in Arabia.

10. Ramaḍān. Expedition of 'Alī to Yemen.
Dhu'l-Qa'da. "Farewell Pilgrimage."

11. Ṣaphar. Expedition ordered against the Byzantines.

Companions of the Prophet.

The *saḥābah*, as they are called, are the subject of a vast literature, and the biographical dictionaries devoted to them, of which the best known are the *Usd ul-ghāba* of the historian Ibn Athīr and the *Iṣābah* of Ibn Ḥajar al-'Asqalāni, enumerate many thousands. The following two lists are of special groups.

(*a*) *Naqībs*, *i.e.* leaders selected by Mahomet from the Medinese tribes: i. *Khazrajites*:—As'ad b. Zurārah, Sa'd b. al-Rabī', 'Abdallah b. Rawāḥah, al-Barā' b. Ma'rūr, 'Abdallah b. 'Amr b. Ḥarām, 'Ubādah b. al-Ṣāmit, Sa'd b. 'Ubādah, al-Mondhir b. 'Amr; ii. *Ausites*: Usaid b. Ḥuḍair, Sa'd b. Khaithamah, Rifā'ah b. 'Abd al-Mondhir.

(*b*) *Commanders of Expeditions*: names occurring in (*a*) are not repeated: 'Abdallāh b. Jaḥsh, 'Abd ar-Raḥmān b. 'Auf, Abū Bekr, Abū Qatādah, Abū 'Ubaidah b. al-Jarrāḥ, 'Ali, 'Alqamah b. Mujazziz, 'Amr b. al-'Āṣ (ibn el-Ass), Bashīr b. Sa'd, Ḍaḥḥāk b. Sofiān, Ghālib b. 'Abdallāh, Ibn Abi'l-Aujā, Ka'b b. 'Umair, Khālid b. al-Walīd, Kurz b. Jābir, Marthad b. Abī Marthad, Muḥammad b. Maslamah, Quṭbah b. 'Āmir, Sa'd b. Abī Waqqāṣ, Sa'd d. Zaid, Salama b. 'Abd al-Asad, Shujā' b. Wahb, 'Ubaidah b. al-Ḥārith, 'Ukkāshah b. Miḥṣan, 'Umar b. al-Khaṭṭāb, Usamah b. Zaid, 'Uyainah b. Ḥiṣn, Zaid b. Ḥārithah.

Authorities.—The biography of Ibn Isḥāq was before the world long before the two chief causes for the falsification of tradition had begun to have serious effects; these were the need for legal precedents, and the concept of saintliness, combining those of asceticism and thaumaturgy. These gave rise to the classical works on the *Evidences of Mohammed's Mission* by Abū Nu'aim (d. A.D. 1012-1013) and Baihaqī (d. A.D. 1066).

Lives of the Prophet († indicates that the work is lost); †'Urwah b. Zubair (d. 712-713); †Musa b. 'Ukbah (d. 758-759); †Mohammed b. Isḥāq (d. 768); Mohammed b. Hishām (d. 828-829), ed. Wüstenfeld (Göttingen, 1860); reprinted in Egypt by Zubair Pasha, a series of excerpts from the last; Mohammed b. Omar al-Wāqidī (d. 823), portion published by Kremer (Calcutta, 1855), abridged trans. of a fuller copy by Wellhausen, *Muhammad in Medina* (Berlin, 1882); Mohammed b. Sa'd (d. 844-845), an encyclopaedic work on the history of Mahomet and his followers, called *Ṭabaqat*, ed. Sachau and others (Berlin, foll.); Mohammed b. Jarīr al-Ṭabarī (see Tabari). Many more writers on this subject are enumerated in the *Fihrist*, cf. Sprenger's *Leben Muhammads*, iii. 54-76.

Among the most popular compilers of later times are: Ibn al-Athir (*q.v.*) al Jazarī, the historian (d. 1233); Aḥmad b. Ali al Kasṭalānī (d. A.D. 1517), whose *al-Mawāhib al-Laduniyyah* was published with commentary (Cairo, 1278); Ḥosain b. Mohammed al Diyarbakrī (d. 1574) whose work *Ta'rikh al-Khamīs* was published in Cairo, A.H. 1382; 'Ali b. Burhān al-dīn al-Ḥalabī (d. A.D. 1634), whose biography called *Insān al-'uyūn* was published in Cairo, A.H. 1292. To these must be added all the collections of Tradition.

Modern Authorities.—The critical study of the Life of Mahomet begins in Europe with the publication by Th. Gagnier in 1723 of the Life by Abulfeda (*q.v.*). Presently there appeared an apologetic biography by Henri Cmte. de Boulainvilliers (2nd ed., Amsterdam, 1731), to which Gagnier replied in 1732 (*La Vie de Mahomet, traduite*, &c. ibid.). The next considerable advance in the treatment of the subject is marked by the biography of G. Weil (*Muhammed der Prophet*, Stuttgart, 1843), which is wholly without religious bias; the popular life by Washington Irving (London, 1849) is based on this. That by J. L. Merrick (the *Life and Religion of Mohammed*, Boston, U.S.A., 1850) rests on Shi'ite sources. The search for MSS. in India conducted by A. Sprenger led to the discovery of fresh material, which was utilized by Sprenger himself in his unfinished *Life of Mohammad* (Pt. 1, Allahabad, 1851), and his more elaborate *Das Leben und die Lehre des Mohammad* (Berlin, 1861-1865), and by Sir William Muir in his *Life of Mahomet*, (London, 1858-1861) 4 vols.: afterwards abridged in one volume and reprinted. These are still the standard treatises on the subject; the pro-Christian bias of Muir is very marked, while Sprenger has hazarded numerous conjectures on subjects with which he had little familiarity. The biography by S. W. Koelle, *Mohammed and Mohammedanism* (London, 1889), is pro-Christian, the popular work of Syed Ameer Ali *The Spirit of Islam*, (London, 1896) an apology for Mahommedanism. Later treatises, resting on original authorities, are those by H. Grimme *Mohamed*, (Münster, 1892, and Munich, 1904), F. Buhl, *Mohameds Liv* (Copenhagen, 1903—Danish: since translated into German), D. S. Margoliouth *Mohammed and the Rise of Islam* (N.Y., 1905, &c.), and Prince Caetani *Annali del Islam*, i. ii. (Milan, 1905-1907). For the direction of public opinion in Mahomet's favour the Lecture on *The Hero as Prophet* in Carlyle's *Heroes and Hero-worship* (London, 1846) was singularly effective; his views were enforced by R. Bosworth Smith *Mohammed and Mohammedanism*, (London, 1873, &c.). A somewhat similar line was taken in France by J. Barthélémy Saint-Hilaire, *Mahomet et le Coran*, (Paris, 1865), while the *Vie de Mahomet d'après la Tradition* of E. Lamairesse and G. Dujarric (Paris, 1897) is written entirely from the Moslem standpoint.

See further Caliphate, *ad init.*; Mahommedan Institutions; Mahommedan Law; Mahommedan Religion.

(D. S. M.*)

1 * is prefixed to names which figure on occasions which seem to be historical. Female names are in italics.

2 Dates are given A.D.

MAHOMMED AHMED IBN SEYYID ABDULLAH (1848-1885), Sudanese tyrant, known as "the Mahdi," was born in Dongola. His family, known as excellent boat-builders, claimed to be *Ashraf* (or *Sherifs*), *i.e.* descendants of Mahomet. His father was a *fiki* or religious teacher, and Mahommed Ahmed devoted himself early to religious studies. When about twenty years old he went to live on Abba Island on the White Nile about 150 m. above Khartum. He first acquired fame by a quarrel with the head of the brotherhood which he had joined, Mahommed asserting that his master condoned transgression of the divine law. After this incident many dervishes (religious mendicants) gathered round the young sheikh, whose reputation for sanctity speedily grew. He travelled secretly through Kordofan, where (with ample justification) he denounced to the villagers the extortion of the tax-gatherer and told of the coming of the mahdi who should deliver them from the oppressor. He also wrote a pamphlet summoning true believers to purify their religion from the defilements of the "Turks" *i.e.* the Egyptian officials and all non-native inhabitants of the Sudan. The influence he gained at length aroused the anxiety of the authorities, and in May 1881 a certain Abu Saud, a notorious scoundrel, was sent to Abba Island to bring the sheikh to Khartum. Abu Saud's mission failed, and Mahommed Ahmed no longer hesitated to call himself al-Mahdi al Montasir, "The Expected Guide." In August he defeated another force sent to Abba Island to arrest him, but thereafter deemed it prudent to retire to Jebel Gedir, in the Nuba country south of Kordofan, where he was soon at the head of a powerful force; and 6000 Egyptian troops under Yusef Pasha, advancing from Fashoda, were nearly annihilated in June 1882. By the end of 1882 the whole of the Sudan south of Khartum was in rebellion, with the exception of the Bahr-el-Ghazal and the Equatorial Provinces. In January 1883 El Obeid, the capital of Kordofan, was captured. In the November following Hicks Pasha's force of 10,000 men was destroyed at Kashgil, and in the same year the mahdi's lieutenant, Osman Digna, raised the tribes in the eastern Sudan, and besieged Sinkat and Tokar, near Suakin, routing General Valentine Baker's force of 2500 men at El Teb in February 1884. The operations undertaken by Great Britain in face of this state of affairs are narrated under Egypt: *Military Operations*. It need only be added that General Gordon (*q.v.*) was besieged at Khartum by the mahdi and was killed there when the town was captured by the mahdists on the 25th-26th of January 1885. The mahdi himself died at Omdurman a few months later (June 22, 1885), and was succeeded in power by his khalifa Abdullah.

When he announced his divine mission Mahommed Ahmed adopted the Shi'ite traditions concerning the mahdi, and thus put himself in opposition to the sultan of Turkey as the only true commander of the faithful. To emphasize his position the mahdi struck coins in his own name and set himself to suppress all customs introduced by the "Turks." His social and religious reforms are contained in various proclamations, one of which is drawn up in the form of ten commandments. They concern, chiefly, such matters as ritual, prayers, soberness in food and raiment, the cost of marriage and the behaviour of women. How far the mahdi was the controller of the movement which he started cannot be known, but from the outset of his public career his right-hand man was a Baggara tribesman named Abdullah (the khalifa), who became his successor, and after his flight to Jebel Gedir the mahdi was largely dependent for his support on Baggara sheikhs, who gratified one of his leading tastes by giving him numbers of their young women. In the few months between the fall of Khartum and his death the mahdi, relieved from the incessant strain of toil, copied in his private life all the vices of Oriental despots while maintaining in public the austerity he demanded of his followers. His death is variously attributed to disease and to poisoning by a woman of his harem. On the occupation of Omdurman by the British (Sept. 1898) the mahdi's tomb was destroyed, his body burnt and the ashes thrown into the Nile (see Sudan: *Anglo-Egyptian*).

See *Mahdiism and the Egyptian Sudan* by F. R. Wingate (1891); *Ten Years' Captivity in the Mahdi's Camp* (1882-1892) from the MS. of Father Joseph Ohrwalder by F. R. Wingate (1892) and *Fire and Sword in the Sudan* (1879-1895) by Slatin Pasha (trans. F. R. Wingate, 1896). Both Ohrwalder and Slatin were personally acquainted with the mahdi, and their narratives contain much first-hand information. Wingate prints many translations of the proclamations and correspondence of the mahdi.

MAHOMMEDAN INSTITUTIONS. Of all the institutions of Islam the caliphate is the oldest, the most fundamental, and in essence the most enduring. For its history see Caliphate; the present subject is its origin and nature. Mahomet enjoyed absolute rule over his people as a divinely inspired and guided prophet. He led the public prayers; he acted as judge; he ruled. If he consulted with others or paid attention to public feeling or local usage, it was as a matter of policy; the ultimate decision lay with himself. He was the state. On his death a leader was put in his place of similar authority, though without the divine prophetic guidance. He was called the "successor" (*khalīfa*, caliph) of the Prophet, later also the *amīr-al-mu'minīn*, commander of the faithful, and was elected by the Moslems, just as the Arab tribes had always elected their chiefs. He was thus an absolute ruler, but was democratically elected; and such is the essence of the caliphate among Sunnite Moslems to this day. For them it has been a matter of agreement (see Mahommedan Law) from the earliest times that the Moslem community must appoint such a leader (see Imām). The Shi'ites, on the other hand, hold that the appointment lies with God, and that God always has appointed, though his appointment may not always have been known and accepted. Their position may be called a legitimist one. Some few heretical sects have held that the necessity of a leader was based on reason, not on the agreement of the community. But, for all, the rule of the leader thus appointed is

The Caliphate.

absolute, and all authority is delegated from him and, in theory, can be resumed by him at any time. Just as God can require unreasoning obedience from his creatures (his "slaves" in Arabic), so can the caliph, his representative on earth.

But Abu Bekr, the first caliph, nominated his successor, Omar, and that nomination was accepted and confirmed by the people. So a second precedent was fixed, which was again carried a step farther, when Moawiya I., the first Omayyad caliph, nominated his son, Yazīd I., as his successor, and caused an oath of allegiance to be taken to him. The hereditary principle was thus introduced, though some relics of the form of election persisted and still persist. The true election possible in the early days of the small community at Medina became first a formal acceptance by the populace of the capital; then an assertion, by the palace guard, of their power; and now, in the investiture of the sultans of the Ottoman Turks, who claim the caliphate, a formal ceremony by the 'ulemā (*q.v.*) of Constantinople. The Ottoman claim is based on an asserted nomination by the last Abbasid, who died in exile in Egypt in 1538, of the Ottoman sultan, Suleiman the Great, as his successor. Such a nomination in itself was a perfectly legal act, but in this case had a fatal flaw. It is an absolute condition, laid down in tradition, that the caliph must be of the tribe of Koreish (Quraish), that of the Prophet.

The duties of this democratically elected autocrat are, in theory, generally stated as follows. He shall enforce legal decisions and maintain the divinely revealed restrictive ordinances; guard the frontiers and equip armies; receive the alms; put down robberies, thieving, highwaymen; maintain the Friday services and the festivals; decide disputes and receive evidence bearing on legal claims; marry minors, male and female, who have no guardians; divide booty. He must be a free, male, adult Moslem; must have administrative ability; must be an effective governor and do justice to the wronged. So long as he fulfils these conditions he is to be absolutely obeyed; private immorality or even tyranny are not grounds for deposing him. This is a position reached by Islam practically. But a caliph who openly denied the faith would be as impossible as an unbelieving pope. The caliph, therefore, is the highest executive officer of a system assumed to be definite and fixed. He, in a word, administers Islam; and the content of Islam is determined by the agreement of the Moslem people, expressed immediately through the 'ulemā, and ultimately, if indirectly and half-consciously, by the people. To depose him a *fatwā* (see Mufti) would be required—in Turkey from the Sheikh-ul-Islām—that he had violated some essential of the Moslem faith, and no longer fulfilled the conditions of a caliph.

The Dīwāns.

But it was impossible for the caliph personally to administer the affairs of the empire, and by degrees the supreme office was gradually put into commission, until the caliph himself became a mere figure-head, and vanished into the sacred seclusion of his palace. The history of the creation of government bureaus (*dīwāns*; see Divan) must therefore now be sketched. The first need which appeared was that of a means of regulating and administering the system of taxation and the revenues of the state. Immense sums flowed into Medina from the Arab conquests; the surplus, after the requirements of the state were met, was distributed among the believers. All Moslems had a right to a certain share of this, which was regarded as booty. Omar, the second caliph, regulated this distribution and also the system of taxation, and the result was the first divan and the constitution of Omar, looked back to now by all Sunnite Moslems as an ideal. The sources of revenue were (i) the poor-rate (*zakāt*), a tithe paid by every Moslem; (ii) the fifth of all booty; (iii) the poll-tax (*jizya*) on non-Moslems; and (iv) the land-tax (*kharāj*) also on non-Moslems. Thus the constitution determined the position of all non-Moslems in a Moslem state. The ideal was that the Moslems should be kept apart as a superior, fighting caste, and that the non-Moslems should support them (cf. Caliphate, B. § 8, on the reign of Omar II.). The Moslems, therefore, were forbidden to acquire land in conquered countries. The non-Moslems must retain their lands, cultivate them and pay the land-tax (the Arabic word is also used of revenue from the work of a slave) and the poll-tax (the Arabic word means also "ransom"), and give contributions in kind to support the local Moslem garrisons which were massed in great camp-cities at strategic points. If a non-Moslem embraced Islam he entered the ruling caste; his land was distributed among his non-Moslem fellows, and he no longer paid the land-tax but rather received support from the public funds. The amount of these pensions varied with the standing of the pensioner from 10,000 dirhems (a dirhem equalled about a franc) to the widows and relations of the Prophet down to 300. This bureau had, therefore, not only to keep the books of the state, but also to maintain a list of all Moslems, classified genealogically and socially. Its registers were kept by Greeks, Copts and Persians; the Arabs, it may be said in general, adopted the method of administration which they found in the captured countries and drew upon the trained services of their inhabitants.

Such a system led naturally to wholesale conversions to Islam; and the consequent decline in revenue, combined with large donations of lands by Othman, the third caliph, to his own family, gradually broke it down. The first patriarchal period of conquest, unearned wealth and the simple life—called by Moslems the period of the "four rightly guided caliphs," and very happily by Sachau, *ein mönchisches Imperium*—passed rapidly into the genuinely Arab empire of the Omayyads, with whom came an immediate development of organization in the state. The constructive genius in this was Moawiya, the first Omayyad caliph. Under him the old simplicity vanished. A splendid and ceremonious court was maintained at Damascus. A chamberlain kept the door; a bodyguard surrounded the caliph, and even in the mosque the caliph, warned by the murder of Othman and of Ali, prayed in a railed-off enclosure. The beginning of the seclusion of the caliph had come, and he no longer walked familiarly among his fellow Moslems. This seclusion increased still further when the administration of the state passed by delegation into other hands, and the caliph himself became a sacrosanct figure-head, as in the case of the later Abbasids; when theories of semi-divine nature and of theocratic rule appeared, as in the case of the Fatimites; and finally when all the elaborate court ritual of Byzantium was inherited by the Ottoman sultans.

But Moawiya I. was still a very direct and personal ruler. He developed a post-system for the carrying of government despatches by relays, and thus received secret information from and kept control of the most distant provinces. He established a sealing-bureau by which state papers were secured against change. He dealt arbitrarily with the revenues of the state and the pensions of the Moslems. Governors of provinces were given a much freer hand, and were required to turn over to the central treasury their surplus revenue only. As they were either conquerors or direct successors of conquerors they had an essentially military government, and were really semi-independent rulers, unhampered except by direct action of the caliph, acting on information sent by the postmaster, who was his local spy. Being thus the heads of armies of occupation, they were not necessarily charged with the control of religious ritual and of justice. These, like every other

function, inhered in the office of the caliph and he generally appointed in each province independent cadis over the courts and imāms to be in charge of religious services. Yet the governor was sometimes permitted to hold these two other offices (see Cadi; Imām).

Further administrative developments came with the Abbasids. They created a new city, Bagdad, between the Tigris and the Euphrates, where the three races, Syrian, Arab and Persian, met and sought with Bagdad as a capital to consolidate the empire. The Arab empire, it is true, had passed away with the Omayyads; yet there might be a chance to create a world-empire of all the Moslem peoples. But not even the genius and administrative skill of the early Abbasids could hold together that unwieldy mass. The semi-independent provinces soon became fully independent, or at most acknowledged the caliph as a spiritual head and paid a nominal tribute. His name might stand on the coinage and prayers be offered for him in the Friday service, the two signs of sovereignty to this day in Islam. With this crumbling of the empire went a more elaborate organization; bureaus took the place of principles and of the energy of individual rulers. As the system of Moslem law was built on that of the Roman codes, so was the machinery of administration on that of Persia. And with the Abbasids the chance of the Persians had come. Abū 'l-Abbās, the first Abbasid caliph, was the first to appoint a vizier (*wazīr*, "helper," so Aaron is wazīr to Moses in the Koran), a confidential minister to advise him and come between him and the people. Advisers the caliphs had had before; but not a definite adviser with this name. He must, we are told, have a strain of the ruler in him and a strain of the people to be able to work with both. He must know how to be acceptable; fidelity and truthfulness are his capital; sagacity, firmness, generosity, clemency, dignity, effectiveness of speech are essential. It is plain that the vizier became as important as the caliph. But Abū 'l-Abbās was fortunate in early securing as his vizier the grandfather of the house of the Barmecides (*q.v.*). On this Persian family the fortunes of the Abbasids hung, and it secured for them and for Islam a short golden age, like that of the Antonines, until the jealous madness of Hārūn al-Rashīd cast them down. Thereafter the vizierate had many vicissitudes. Technically a vizier could be either limited or unlimited. The limited vizier had no initiative; he carried out the commands of the caliph. The unlimited vizier, often afterwards called the grand vizier, exercised full authority and was the *alter ego* of the caliph, to whom he was required only to report. Naturally the formal distinction is a later theorizing of history; for a weak ruler his vizier became absolute, for a strong ruler his vizier remained subordinate. Here, as with regard to all Moslem institutions, a marked distinction must be made between the historic facts and the speculative edifices raised by constitutional theorizers. Compare especially Mahommedan Law. Until the time of Rāḍī (934-940) the vizierate thus fluctuated in importance. In that caliphate the vizier lost all authority, and in his place came the *amīr al-omarā*—equivalent to the *major domus* of the Franks—the head of the Turkish bodyguard, in terror of whom the caliph now stood. When in 945 the Būyids captured Bagdad and the caliph became a purely spiritual sovereign, they took the title "vizier" for their own chief minister, and the caliphs retained only a secretary (see Caliphate, C. § 22). Under the Seljuks, however, they regained their viziers and some real authority. Elsewhere, also the vizierate had its vicissitudes. Under the Mamelukes the vizier fell to be merely the court purveyor. Under the Omayyads of Spain the title was given to several responsible officers of the state, but their chief was called *ḥājib*, chamberlain. Under the Almohades the chamberlain was called vizier. In the modern Turkish empire the grand vizier (called generally *ṣadr A'ẓam*) is the sultan's representative in secular matters, and nominally stands between the sovereign and all the other officials. He is the president of the council of ministers, but Abd-ul Hamid II. deprived the office of almost all its importance.

The Vizierate.

Under the early Abbasids the four most important ministers were the chief cadi, the chief of police or head of the life guards, the minister of finance and the postmaster, who was the head of the system of information and espionage which covered the empire. But at different times the different bureaus varied greatly. Under Motawakkil we find the bureau of taxes and finance; bureau of the crown estates; bureau of state book-keeping; bureau of war, *i.e.* of hired troops; bureau which kept reckoning and control of the pensions of the clients and slaves of the ruling family; bureau of the post system; bureau of expenditures. But in spite of this elaborate system, no Moslem government has, except sporadically, been highly centralized. Provided the taxes are paid, a large measure of local autonomy has always been enjoyed by the country districts. Under the Abbasids almost the only exception was the necessarily centralized control of the irrigation system of the Tigris and Euphrates. And similarly elsewhere.

Other Ministers.

In the case of all these offices, we have delegation by the caliph, under necessity, of his too heavy burdens. But one duty of an Oriental ruler he could not so easily lay aside. It had always to be possible for the oppressed to come into his presence and claim justice; he must sit in the gate and judge. Therefore, when the caliph found it necessary to delegate the ordinary administration of justice, he found it also necessary to set up a special court of oppressions, which developed, to a certain extent, into a court of appeals. The first to establish such a separate court was Abdalmalik the Omayyad (685-705), and his example was followed by the more vigorous of the caliphs up to the time of Mohtadī the Abbasid (869-870). If any other than the caliph presided over this court it had to be a man whose dignity, independence and authority commanded respect. He was not bound by strict rules of evidence, method and literal application of law as was the cadi. Rather, he applied a system of equity suited to the absolute source of authority which he represented.

As the chief of police, mentioned above, was rather the head of the caliph's bodyguard, there was also a police system after our ideas, but more thoroughgoing. The *muhtasib* had charge in the broadest sense of public order and morals in the streets, and had oversight as to weights, measures and adulterations; but had no right to interfere privately or enter houses save in the clearest and most necessary cases. He had a summary jurisdiction in all minor cases where no trial was necessary; but where witnesses and oaths entered the case must go to the cadi. Slaves and beasts of burden were under his guardianship; he prevented public scandals, such as the sale of wine; he regulated the public conduct of Jews and Christians. In the interest of public morals he had to find suitable husbands for widows and see that they did not marry before the legal time; questions of paternity also he had to investigate. The outdoor costume of the people he could regulate. It should, of course, be remembered that the canon law of Islam covers minutely all sides of life (see Mahommedan Law).

It is impossible in Islam to separate logically from the mass of institutions those which we should call religious, as Islam on all sides is for the Moslem equally religious. But perhaps the following may practically be separated under that rubric. Islam, runs a tradition, is built on five things: testimony that there is no god save Allah, and that Mahomet is the apostle of Allah; prayer; the poor-rate; pilgrimage; fasting. For these see

The law and usage of religious foundations in perpetuity (*waqf*, mortmain) became as important in Islam as monastic endowments in medieval Europe, and such foundations tended similarly to absorb the greater part of the national wealth. It was the only safe way of providing for posterity. A pious foundation could be erected in such a way that either so much from its funds would be paid yearly in perpetuity to the descendants of the erector, or those descendants would be employed as officials of the foundation.

When it became impossible for the caliph to lead the people personally in prayer in the mosque, he delegated that part of his duties to another, hence called imām (*q.v.*). Naturally, then, the appointment of the imām would lie with the supreme ruler. This holds of the daily prayers in the principal mosque (*al-masjid al-jāmi'*) supported by the ruler where the Friday service is held, but in the separate smaller mosques built by each community the community chooses its own imām. With regard to the Friday service, the schools of law disagree as to the necessity of the presence of an imām appointed by the chief ruler. But the imām should certainly make mention of the ruler in his sermon and pray for him. At the occasional prayers, such as those for rain, &c., the presence of an imām appointed by the ruler is not necessary. The imām appoints the *muaddhin*, the announcer of the hour of prayer from the minaret, and both have a claim on the state treasury.

The Imām.

Another office exercised when possible by the caliph, but very frequently delegated to some high dignitary, such as the heir to the caliphate or a prince, was the leadership of the pilgrimage caravan to Mecca and back. Sometimes this official, called *amīr-al-ḥajj*, was appointed imām as well. He then led all the pilgrimage ceremonies at Mecca. When outside of towns where there was a cadi he exercised also over the caravan the rights of a judge.

Mahommedan law (*q.v.*) is treated separately. Here, again, as judging is a duty of the caliph, a cadi is the delegate, or, when appointed by a vizier or governor, a delegate of his delegate. He examines into disputes brought before him and enforces his judgments, he names administrators of the estates of minors, the insane, &c.; he supervises the *waqf* property of mosques and schools in his district and inspects highways and public buildings; he watches over the execution of wills; he inflicts the due legal penalties for apostasy, neglect of religious duties, refusal to pay taxes, theft, adultery, outrages, murder; he can inflict the penalties of imprisonment, fine, corporal punishment, death; if there is no imām, he can perform his duty, as in fact can anyone who has the requisite knowledge. But it should be noticed that all this holds only of the un-europeanized Moslem state.

The Cadi.

For the existence of an army in Islam, there are two grounds, the holy war (*jihād, q.v.*) against unbelievers without the state and the suppression of rebellion within. Under the ordinance of Omar the entire community was preserved and used as a weapon for the subduing of the world to Islam, and every able-bodied male Moslem was theoretically a fighting man, part of the national militia. This army was divided into corps situated in the conquered lands, as armies of occupation, where they eventually came to form military colonies in great camp-cities. The occupied countries had to support them, and they were bound to render military service at any time. But as the ideal of Omar broke down before facts the use of mercenary and slave troops finally increased; although there has always continued in Moslem armies acting against unbelievers a proportion of volunteers not paid a fixed wage but subsidized by the state from the poor-rate and alms funds. The generals were appointed by the caliph, and had either unlimited authority to act as his representatives, concluding peace, acting as cadi and imām, distributing booty; or were restricted within limits, *e.g.* to simple leading of the troops and carrying on military operations. They, in turn, appointed their subordinates; this principle of giving a head full powers and full responsibility was very generally applied in Islam. It was controlled of course by the espionage of the postal system. As war by a Moslem power is essentially sacred war, the regulations of *jihad* must be considered here. Unbelievers must first be invited to embrace Islam and, if they follow a sacred book and are not idol-worshippers, are given a choice between (*a*) becoming Moslems; or (*b*) submitting to the Moslems and entering on a treaty with them of protection and tribute; or (*c*) fighting. If they accept Islam, their lives, families and property are secure, and they form henceforth part of the Moslem community. The ability of Islam to create a common feeling between highly different races is one of its most striking features. If they submit and enter on treaty relations, they pay a poll-tax, for which their personal safety is assured, and assume a definitely inferior status, having no technical citizenship in the state, only the condition of protected clients (*dhimmīs*). If they elect to fight, the door of repentance is open, even when the armies are face to face. But after defeat their lives are forfeit, their families are liable to slavery, and all their goods to seizure. It is open to the sovereign either to put them to death; or to enslave them; or to give them their liberty; or to exchange them for ransom or against Moslem prisoners. The sovereign will choose that which is best for Islam. As for their families and wealth, the sovereign can release them only with consent of the army that has captured them. Apostates must be put to death. Four-fifths of the booty after a battle goes to the conquering army.

The Army.

The technical art of war seems to have been little studied among Moslems; they have treatises on archery but very little upon tactics. Their writers recognize, however, the essential difference between the European and Persian methods of charging in solid lines and holding the ground stubbornly, and the Arab and Berber method of flying attacks and retreats by clouds of cavalry. Therefore, one explained, the custom grew of using a mass of European mercenaries as a fixed nucleus and rallying-point. The early Moslem armies, too, had used the solid, unyielding charge, which may have been the secret of their success. For one of the greatest puzzles of history is the cause which changed the erratic, untrustworthy swarms of Arab horsemen with their childish strategy into the ever-victorious legions of the first caliphs. They certainly learned rapidly. Byzantium and Persia taught them the use of military engines and the entrenched camp. Before that they had been, at the best, single knights with mail-shirt, helmet, sword and lance. Bowmen, too, they used, but the principal use of the bow seems to have come with the Turks.

The glory of Moslem education was its university system, which fed the higher learning and did not serve everyday needs. Its primary system was very poor, almost non-existent; and technical education has never been recognized in Islam. Primary teachers were despised as ignorant and foolish. Apparently, if we may trust the many stories of how ignorant men set up for themselves, there was no control of them by the state. Their pupils were young only; they taught the rudiments of reading, Koran, catechism, prayer, writing and arithmetic, but very little of the latter. Technical

Education.

education was given by the gilds through their apprentice system, teaching mechanical arts and crafts. This was genuine instruction, but was not so regarded; it was looked upon rather as are the mysteries and secrets of operative masonry. It produced artisans of independent character, but not artists. Thus there was no distinction between architect and builder; there was no sculpture; and painting, so far as it went, was like carving, a craft. All Moslem university education, like all Moslem science, revolved round theology. There were, apparently, only two outstanding exceptions to this rule, the academy of Mamun (813-833) at Bagdad, and the hall of wisdom of the Fatimites at Cairo (1004-1171); both of these are explained by their environment. From the earliest times, independent scholars instructed classes in mosques—the common places of meeting for the community—and gave their pupils personal certificates. Their subjects were the reading and interpretation of the Koran; the body of traditions from the Prophet; the thence deduced system of theology; the canon law. But the interpretation of the Koran involved grammatical and lexicographical studies of early Arabic, and hence of the early Arabic literature. Theology came to involve metaphysical and logical studies. Canon law required arithmetic and mensuration, practical astronomy, &c. But these last were strictly ancillary; the object of the instruction was primarily to give knowledge of value for the life of the next world, and, secondarily, to turn out theologians and lawyers. Medicine was in Jewish and Christian hands; engineering, architecture, &c., with their mathematical bases, were crafts. Then this instruction was gradually subsidized and organized by the state, or endowed by individuals. How early this took place is uncertain. But the individual teacher, with his certificate, remained the object of the student; there was nothing corresponding to our general degrees. Thirdly, educational institutions came to be equipped with scholarships of money or in kind for the students. The first instance of this is generally ascribed to Nishapur (Naisābūr) in 1066; but it soon became general in the system and afforded a means of control and centralization. A final, and most important, characteristic was the wide journeying of the students "in search of knowledge." Aided by Arabic as the universal language of learning, students journeyed from teacher to teacher, and from Samarkand to the Atlantic, gathering on their way hundreds of personal certificates. Scholars were thus kept in touch all over the Moslem world, and intellectual unity was maintained.

To the democratic equality of Islam, in which the slave of to-day may be the prime minister of to-morrow, there is one outstanding exception. The descendants of the Prophet and of his relatives (the family of Hāshim) formed and form a special class, held in social reverence, and guarded from contamination and injury. These are the *sayyids* (lords), and genealogical registers of them are carefully preserved. They are of all degrees of wealth and poverty, but are guarded legally from *mésalliances* with persons of ignoble origin or equivocal occupation. Their influence is very great, and in some parts of the Moslem world they have the standing and reverence of saints.

The Sayyids.

See Von Kremer, *Culturgeschichte des Orients*, based largely on Māwardī's *Aḥkām*, trans. in part by Ostrorog; McG. de Slane's trans. of Ibn Khaldūn, *Prolégomènes*; Lane, *Manners and Customs of the Modern Egyptians*; R. F. Burton, *Pilgrimage to Mekka*; Snouck Hurgronje, *Mekka*; Hughes, *Dictionary of Islam*; Juynboll, *De Mohammedaansche Wet*; Macdonald, *Development of Muslim Theology*, &c. For women in Islam, see HAREM.

(D. B. MA.)

MAHOMMEDAN LAW. The legal situation in the Moslem world is of the highest complexity, and can be made intelligible only by tracing its historical development. First came the system (*fiqh*, *sharī'a*) which takes the place in Islam of canon law in Roman Christendom. It begins with Mahomet sitting as judge over the primitive Moslem community at Medina. He was the Prophet of God, and judged, as he ruled, absolutely; any decision of his was valid. But he found it, in general, advisable and fitting to follow the local law or usage of Medina when the new faith did not require a change. It thus came about that his decisions followed, at one time, the usage of the Arab tribes of Medina; at another, the law respected by the Jewish tribes there—a rabbinic development of the law of Moses, deeply affected by Roman law; at another, the more developed commercial law of Mecca, known to his followers who had fled thence with him; or, finally, his own personal judgment, stated it might be as his own sense of right or as the decision of Allah and even incorporated in the Koran. In his use of these he was an eclectic opportunist, and evidently, except as regards such frequently recurring subjects as inheritance, marriage, &c., had no thought of building up a system or code. At his death he left behind only a few specific prescriptions in the Koran and a mass of recorded decisions of cases that had come before him. He had used himself, in our terms, common law, equity, legislation; to guide his followers he left his legislative enactments and the record of his use of common law. Since his death there has been no new legislation in orthodox Islam.

With the death of Mahomet began the development and codification of Moslem law. It was at first entirely practical. Cases had to be decided, and to decide them there was, first, the Koran; secondly, if nothing *ad rem* was found in the Koran, there were the decisions of the Prophet; thirdly, if these failed, there was the common law of Medina; and, fourthly, if it, in turn, failed, the common sense of the judge, or equity. A knowledge of the decisions of Mahomet came thus to be of great importance, and records of such decisions were eagerly sought and preserved. But this was simply a part of a much wider movement and tendency. As among primitive peoples in general, custom and usage have always been potent among the Arabs. The ways of the fathers, the old paths, they love to tread. Very early there arose a special reverence for the path and usage (*sunna*) of Mahomet. Whatever he did or said, or left unsaid or undone, and how he did it, has become of the first importance to the pious Moslem, who would act in every way as did the Prophet. There is evidence that for this purpose the immediate companions of Mahomet took notes, either in memory or in writing, of his table talk and wise sayings, just as they took down or learned by heart for their private use the separate fragments of the Koran. His sayings and doings, manners and customs, his answers to questions on religious life and faith, above all his decisions in legal disputes, came to be recorded on odd sheets in private notebooks. This was the beginning of the enormous literature of traditions (*ḥadīth*) in Islam. The collecting and preserving of these, which was at first private, for personal guidance and edification, finally became one of the most

powerful weapons of political and theological propaganda, and coloured the whole method and fabric of Moslem thought. All knowledge tended to be expressed in that form, and each element of it to be traced back to, and given in the words of, some master or other through a chain of transmitters. Above all there grew up an enormous mass of evidently forged sayings put into the mouth of Mahomet. At every important political or theological crisis each party would invent and put into circulation a tradition from him, supporting its view. By a study of these flatly opposed "sayings" it is possible to reconstruct the different controversies of Islam in the past, and to discover what each party regarded as the essence of its position.

> The first collecting of traditions was for private purposes, and the first publication dealing with them was legal. This was the Muwaṭṭa' of Malik ibn Anas (d. 795), a *corpus juris* based partly on traditions, and a protest in its methods against the too speculative character of the books of canon law which preceded it. Thereafter came collections of two different types. The earlier kind was arranged according to the companions of Mahomet, on whose authority the traditions were transmitted; after each companion came the traditions going back to him. The best known example of this kind is the *Musnad* of Aḥmad ibn Ḥanbal. The other kind, called *Muṣannaf* (classified), contains traditions arranged in chapters according to their subject matter. That of Bukhārī is the most famous, and is arranged to give a traditional basis for a complete system of canon law; its rubrics are those of such a system. Another is that of Muslim ibn al-Ḥajjāj, who paid less attention to legal aspects and more to minute accuracy. There are many others of more or less acceptance and canonicity. Bukhārī's book enjoys a reverence only second to that of the Koran. But in all these publications the primary object was to purify the mass of traditions of forged accretions and to give to the believer a sound basis for his knowledge of the usages of the Prophet, whether for his personal or for public use. These two kinds were a natural development. In the Moslem community there were from the first students of tradition proper whose interest lay in collecting, testing and transmitting, not in combining, systematizing and elucidating; whose preference was to take a single statement from the Prophet and apply it to a case, without reasonings or questionings. And there were students of canon law who were interested rather in the system and results, and who, while they used traditions, used them only to an end and insisted on the free application of speculative principles. The conflict of the future was to be between these traditionalists, on the one hand, and rationalists, on the other; and the result was to be a compromise.

With the wide sweep of Moslem conquest another element came into the development. This was Roman law, which the Moslem jurist found at work in the conquered Roman provinces and in the law courts of which they went to school. It is to be remembered that the Arab armies were not devastating hordes; they recognized the need of law and order wherever they went, and it was the policy of their leaders to take over the administrative systems of the countries which they seized. Even the Arabic legal nomenclature shows evident signs of literal translation from Latin, and many Moslem principles can be traced to the Roman codes. One important development was plainly influenced by the liberty involved in the *Responsa prudentium* of Roman lawyers, and by the broad conception of the law of nature in the Edict of the Praetor. In its earliest stages Moslem law recognized in the judge a liberty of opinion (*ra'y*) which went beyond even that of the *Responsa* and became plain equity, in the English sense, and one school (the Hanifite) established as a basis the right of preference (*istiḥsān*) even when the analogy of the code dictated otherwise; while another (the Malikite) used the term *istiṣlāḥ*, "a seeking of (general) benefit" to the community, in a similar situation. But these developments were bitterly contested, and the liberty of opinion was in the end narrowed down to a principle of analogy (*qiyās*), the nearest approach to which in Western law is legal fiction.

It is necessary now to return to the first successors of Mahomet. "For thirty years after my death," he is said to have declared, "my people will tread in my path (*sunna*); thereafter will come kings and princes." This tradition crystallizes the later feeling of Islam. The first thirty years were a golden age; the centre of the state was the Prophet's own city of Medina; the conditions of the state continued in close conformity to those of his own time. The study of tradition, *i.e.* of his usage, went hand in hand with the study of law. They were vital functions of the state, and it encouraged both.

Then came the great *débâcle*. The *ancien régime*, a semi-monkish, theocratic empire, went down, and the Omayyad dynasty, kings and princes of the old Arab type, took its place (see Caliphate, B). The public life of the state was no longer deeply religious; the pious said that it was godless. Under these conditions law was indeed still needed; but it had to be opportunist. Its development went on, but became speculative. The study of tradition was now private, and its students were more and more the personally pious. There were, thus, two results. On the one hand, the framers of systems of canon law—as it now was—no longer lived in contact with reality; hypothetical and ideal structures were reared which could never stand the touch of the practical law-court. And on another, traditions and law, even this hypothetical law, came to take separate roads. The interest of the students of tradition became the gathering of traditions for their own sake, going no farther than a striving to regulate each detail of life by some specific, concrete, prophetic dictum. They had no use for systems that went beyond the mere registering of these dicta. The feeling also became widespread that any system of government which did not simply reproduce the patriarchal form of Medina was of the world and the devil—a thing with which no religious man could have aught to do. At every turn he would have to peril his soul.

Here we must place the transition of this law with which we have hitherto dealt from being the law of the land to being in essence a variety of canon law. It was always broader than any western secular law. It regulated all the aspects of life—duty to God, to one's neighbour, to one's self. It was really a system of duties, ethical, legal, religious. It did not limit itself to defining the forbidden (*ḥarām*); but designated actions also as required (*farḍ*, *wājib*), recommended (*mandūb*, *mustaḥabb*), indifferent (*jā'iz*, *mubāḥ*), disliked (*makrūh*). It played the part of, or rendered necessary, a religious director quite as much as a lawyer. And for a time at Medina it was really the law of the land. But from the Omayyad period on it has held the position of the canon law of the Roman Church in countries that will not recognize it and yet dare not utterly reject it. It governs, in one or other of its four schools, the private lives of all pious Moslems; it regulates some semi-public relationships—*e.g.* marriage, divorce, inheritance; it compels respect, if not acceptance, from the state; and by its ideal standard the world, filled with righteousness by the Mahdi, will be ruled in the Moslem millennium.

The rise of the Abbasids brought a change, but not a great one. They had promised a return to the old religious attitudes, and the promise was formally kept. But in substance they were as much as the Omayyads,

and though the state was outwardly on a pious footing, and the religious sentiment of the people was respected, the old, absolute canon law was not restored. It was made possible for more theologians and lawyers to work with the state, but an irreconcilable party still remained, and the situation was fixed as it is to this day. It is true that the struggle to adapt such a single and detailed system to all the varying conditions, climates and times of the great empire was impossible; but the failure marked the great rent in the supposed unity of Islam between the church and the world, religion and law.

Yet the Abbasids did, in their way, encourage legal studies, and under them processes and results, long pursued in private, became public. Almost within the first century of their dynasty the four legal schools, or rites, were formed and the principles established which survive to this day.

The first school to take definite form was the Hanifite, founded by Abū Ḥanīfa (d. 767), who left behind him a definite system and many enthusiastic pupils. He was a man of means, in touch with commercial, but not with practical legal life, a speculative or philosophical jurist. Being of non-Arab origin, the usage of Medina had small interest for him. He therefore used few traditions, and preferred to go back to the Koran, and extract from it by reasoning the rulings which fitted his ideas. This he called the use of analogy (*qiyās*); but, in his hands, it became practically legal fiction, the application of a law in some sense undreamed by its first imposer. But he had another, and still freer instrument. The effect of differences in local conditions had been early observed and admitted in general terms. Abū Ḥanīfa reduced it to a subjective formula. Under such conditions he claimed the right of preference (*istiḥsān*) of a ruling suited to the local needs, even when the strict analogy indicated otherwise. This met and meets with vehement protest when formally stated, but the usage of Islam has practically accepted it. His system, finally, was not developed through the exigencies of actual cases, but was worked out as a system of casuistry, though in a good sense. He tried, that is, to construct a system of rules to answer any conceivable question. After his death his pupils elaborated it still further, and accepted public office. The ʻAbbāsids adopted his school, and threw their influence on its side; its philosophic breadth and casuistic possibilities evidently commended it to them. Later, the Ottoman Turks also adopted it, and it may be said to hold now a leadership among the four legal rites. Its influence has undoubtedly tended to broaden and humanize Moslem law.

Twenty-eight years after Abū Ḥanīfa, Malik ibn Anas, the founder of the Malikite school, died at Medina. In many points his situation was precisely opposite to that of Abū Ḥanīfa, and yet his results were very similar. He was a working jurist, in practical touch with actual life; he was in the centre of the tradition of the usage of the Prophet, in the line, one might say, of the apostolic succession. He, therefore, used traditions much more generally than did Abū Ḥanīfa, and when he, under pressure, took refuge in opinion, he certainly felt that he, under his conditions, had a better right to do so than any outsider. But two of his principles marked a distinct advance and showed that he was no mere traditionalist. For one, he laid down the conception of public advantage (*istiṣlāḥ*); when a rule founded on even a valid analogy would work a general injury it was to be set aside; justice must not be overcome by logic. And, for the other, he laid stress on the conception of the agreement (*ijmāʼ*), an idea which was to have indefinite importance in the future. When the surviving companions of the Prophet, after his death, agreed upon any point as belonging to their store of tradition and experience, their agreement was accepted as final. In the first instance they agreed that such had been the statement of the Prophet. That easily passed over into an agreement that such was the true Moslem view, and finally into an acceptance of the principle that the Moslem Church, when unanimous, could formulate truth—practically as in the canon of Vincent of Lérins, *Quod semper, quod ubique, quod ab omnibus*. But such a broadly catholic position was still in the future, and for Malik, juristic agreement meant the agreement of Medina, though there are signs that he permitted the same latitude to other places also. It was a way of allowing for local conditions rather than of reaching the voice of the Church. His law book, the *Muwaṭṭaʼ*, the earliest in our possession written by the founder of a school, has already been mentioned. It is a collection of about seventeen hundred traditions of juristic importance, arranged according to subject, with appended remarks on the usage of Medina and on his own view of each matter.

So far opinion and local usage had fully held their own, and the philosophical jurist had been free to work out his system. The difference between the *istiḥsān* of Abū Ḥanīfa and the *istiṣlāḥ* of Malik was not great; students attended the lectures of both and combined their systems. But a reaction now began, and the traditionalist party finally made itself felt. We have the inevitable rivalry between the historical-empirical and the speculative-philosophical schools of jurisprudence, rendered all the more bitter in that the historical lawyers believed, in this case, that they were defending a divine institution. There resulted, first, one of the most important schools, the Shāfiʻīte; secondly, an extremely literal school for which ash-Shāfiʻī did not go far enough, and which has now vanished; and thirdly, the Ḥanbalite school, still surviving in small numbers, more moderately traditional than the last.

The school founded by ash-Shāfiʻī (d. 820), a pupil of Malik, came first in order of time. The others were really revolts against the mildness of his compromise. His characteristics were a broad-minded, steady grasp of means and ends, a perception of what could and what could not be done, a willingness to admit all the tried principles in due balance, and, at one point especially, the insight of genius as to the possibilities of these principles. He laid great stress on tradition; a clear, authentic tradition he regarded as no less valid than the Koran itself. If the tradition was chronologically later than a Koranic passage and corrected that passage, he followed the tradition. But in this he was only regulating a fixed tendency. The Koran may be regarded theoretically as the first of all the sources of law and theology; practically its clear statements have been over-ridden in many cases. Most important of all, the principle of agreement (*ijmāʼ*) came finally with him to its full rights. The agreement of the Moslem peoples was to be the voice of God. “My people,” said a tradition from Mahomet, “will never agree in an error.” And so, over traditions and over the Koran itself, the agreement tacitly or explicitly ruled and rules. It stamps as authoritative that which the other principles lay down. At the head of each section of a Shāfiʻīte law book we read, “The basis of this, before the agreement, is such and such.” But with the aid of a principle of this breadth it was easy to reject the opinion which was so objectionable to the traditionalist party. In its place he took analogy (*qiyās*), which, discreetly used, could serve almost the same purpose. The Koranic passage or the tradition with which an analogy was suggested should, he taught, be examined to see if there was a reason clearly stated for the command. If so, that reason would give a basis for the analogy. Analogy based on the mechanical or external could not hold.

The four bases thus laid down by ash-Shāfiʻī—Koran; prophetic usage as expressed in traditions; analogy; agreement—have come to be accepted by all existing schools. This applies to all spheres of life, ethical, social, theological, legal, and it should never be forgotten that the Koran is only one of the sources for Moslem faith

and conduct.

Few words are needed for the other, reactionary schools. One, now long extinct, was founded by a certain Dā'ūd uẓ-Ẓāhirī, "David the Literalist," born three or four years before the death of ash-Shāfi'ī, and so called because he insisted upon an absolutely literal interpretation of his texts—Koran or tradition—without account of context or metaphor. In consequence he had to reject analogy, and limited agreement to that of the companions of Mahomet; the Church of Islam was to have no constructive authority. In one point he showed great sanity of judgment, namely in his rejection of the principle *jurare in verba magistri*, otherwise regnant in Islam. His school had long and interesting consequences, mostly theological, but is now extinct, and never took rank with the others. The Moslem world found his positions too impossible, and now no one swears to his words. The other, the Ḥanbalite school, was founded by the scholars of Aḥmad ibn Ḥanbal after his death in 885. He himself would never have revolted against his master, ash-Shāfi'ī, but it was soon felt that his system, so far as he had any, was in essential opposition. He had been no lawyer, but a theologian and a collector and student of traditions. All his life had been a protest against speculation in divine things. Where the Koran and traditions were silent, he, too, had been silent. For this agnostic principle he had witnessed and suffered, and his standing with the people was that of a saint. Naturally, then, the last still existent school of traditionalist protest was launched in his name. It minimizes agreement and analogy, is literal in its interpretations, and is now by far the smallest of the four surviving schools. Its external history is that of a testifying and violent minority.

Other men, such as Ṭabarī, the historian and commentator, have had dreams that they, too, might join the Four Imāms (see Imām) as founders of legal rites, but none has succeeded. The Four remain the ultimate exponents of this canon law, and under the banner of one or other of them every Moslem must range himself. As there is a principle of unity in Islam, expressed in the alleged prophetic saying, "My people will never agree in an error," so there is a principle of variety, also expressed in an alleged prophetic saying, "The disagreement of my people is a mercy from God." The four rites may differ upon many points, yet the adherents of one never dream of regarding the adherents of the others as outside the Church of Islam; they are not "dissenters" in the English sense. God is merciful to his creatures, and gives them so much liberty of choice. Yet in practice this liberty is not great. The principle of swearing to the words of the master is a dead hand laid upon Islam. A man's legal rite is generally settled by the place and other conditions of his birth, and after he has once accepted a rite, he must, if good and pious, follow it in all its details. Only the avowed sceptic or the recognized eccentric can be an eclectic.

The geographical distribution of the rites is roughly as follows: Moslems in Central Asia and northern India and the Turks everywhere are Hanifites; in Lower Egypt, Syria, southern India and the Malay Archipelago they are Shāfi'ites; in Upper Egypt and in north Africa, west of Egypt, they are Malikites; only the Wahhābis (*q.v.*) in central Arabia are Ḥanbalites. But the will of the sovereign has also had a powerful influence and has frequently dictated the legal, as well as the theological, affiliations of his subjects. The Turks, for example, have thrown their weight almost everywhere on the Hanifite side. Their policy is to appoint only Hanifite judges (see Cadi), although for private and personal questions they appoint and pay Muftis (*q.v.*) of the other rites. In other cases, with a population of mixed legal adherence, the government has been known to appoint judges of different rites.

The Shī'ite canon law is dealt with separately, but some mention of two outstanding sects is here in place. The Ibāḍites (see Mahommedan Religion: *Sects*) have a system of canon law which in essentials is of older codification than that of any of the orthodox schools, going back to Abdallah ibn Iḍād himself, of the first century of the Hijra (Hejira). Its basis is above all the Koran, then a sparing use of traditions, natural to their early origin, and finally the agreement of their own learned men, again natural to an extreme dissenting sect, and it still rules the Ibāḍite communities at Oman, Zanzibar and the Mzab in southern Algeria. At all these places they, the last descendants of the Khārijites, hold severely apart, while the other Moslems shrink from them as heretics of the worst. Not nearly so far from ordinary Islam, but still of an extreme self-conscious Puritanism are the Wahhābis. They are really Ḥanbalites, but apply the rules of that school with uncompromising, reforming energy. The doctrine of the agreement of the Church of Islam they reject; only that of the immediate companions of Mahomet is valid. The people of Mahomet can err and has erred; each man must, on his own responsibility, draw his doctrine from the Koran and the traditions. Here they follow the Ẓāhirites.

All these schools of law administer a scheme of duties, which, as has already been remarked, comes nearest to the canon law of the Roman Church, and which for centuries has had only a partial connexion with the real legal systems of the Moslem peoples. Among the Wahhābis and Ibāḍites alone is it the whole of law. Elsewhere, since the Omayyad period, its courts have been in great part pushed aside by others, and its scheme has come to be regarded as an expression of impossible theory, to be realized at best with the coming of the millennium. The causes and methods of this change call now for detailed notice.

As Islam spread beyond the desert and the conditions in which the life of Mahomet and his companions had been cast, it came to regions, climates, customs, where the Arabian usages no longer held. Not only were the prescripts of Medina ill adapted to the new conditions; the new people had legal usages of their own to which they clung and which nothing could make them abandon. It was rather the Moslem leaders who were compelled to abandon their ideas and for the sake of the spread of Islam to accept and incorporate much that was diametrically opposed to the original legislation either of the Koran or of Mahomet's recorded decisions. As in religion the faiths of the conquered peoples were thinly veneered with Moslem phrases, so in law there grew up a customary code (*'ādāt*) for each country, differing from every other, which often completely obscured and annulled the prescriptions of the canon law. The one was an ideal system, studied and praised by the pious learned; the other was the actual working of law in the courts.

But besides the obstinate adherence of various peoples to their old paths, the will of individual rulers was a determining factor. When these ceased to be saints and students of divine things, and came to be worldly statesmen and opportunists, followers of their own objects and pleasures, no system could hold which set a limit to their authority. The Oriental ruler must rule and judge on his own initiative, and the schools of canon law tended to reduce everything to an academic fixedness. There thus arose a new and specific statute law, emanating from the sovereign. At first he judged in the gate as seemed good in his eyes and as was his right and duty (cf. "court of oppressions"; see Mahommedan Institutions); later, his will was codified as in the Turkish

statute law (*qawānīn*) derived from various European codes. Thus there has grown up in almost every Moslem country at least two systems of courts, the one administering this canon law, and taking cognisance of private and family affairs, such as marriage, divorce, inheritance, its officials also giving rulings on purely personal religious questions, such as details of the ritual law, the law of oaths and vows, &c.; the other, the true law courts of the land, administering codes based on local custom and the decrees of the local rulers.

A rift almost as important entered the legal life of the Moslem lands on another side. Non-Moslem communities, settled in Moslem territory, have been uniformly permitted to administer and judge themselves according to their own customs and laws. Save when they come into direct contact and conflict with Moslems, they are left to themselves with a contemptuous tolerance. The origin of this attitude in Islam appears to be threefold: (i) The Islam of theory cannot conceive of a mixed state; it takes account, only, of a state containing none but Moslems, and its ideal is that the whole world will, in the end, form such a state. In practice, then, Moslems try to shut their eyes to the existence of non-Moslems in their midst and make no provision for them until compelled. That a non-Moslem should have the same civil position as a Moslem is unthinkable. (ii) This, of course, produces an attitude of extreme contempt. The only citizens are Moslems and all others are to be looked down upon and left to themselves. What they do or think among themselves does not matter; they are outside the ring-fence of Islam. (iii) A different, but equally important, cause is the Moslem indolence. When the Arabs conquered, they knew that they must administer the conquered lands, and they, very wisely, sought help from the machinery which they found in operation. But besides the ordinary organization of the state, they found also various ecclesiastical organizations, Christian and Jewish, and to these they gave over the administration of the non-Moslem sections of the community, making their rabbis and bishops their responsible heads and the links of contact with the Moslem rulers. They, unquestionably, found the same method in use by the Byzantine government; but in Moslem hands it went so far as to make a number of little states (*millet*, *milal*) within the state and effectually to preclude the possibility of ever welding all the inhabitants of the land into one corporate life.

But this indolence, when applied to resident aliens, had consequences still more serious, because external as well as internal. Following the same method of leaving the unbeliever to settle his affairs for himself, the European merchant, living and trading in the East, was put first by usage and finally by treaty under the jurisdiction and control of his own consul. Thus there grew up the extra-territorial law of the capitulations and conventions, by which the sanctity of the person and household of an ambassador is extended to every European. And this in turn, has reacted on the status of the non-Moslem subject races, and has come to be the indirect but chief support on which they lean. Through it, an element has developed which makes it practically impossible for a Moslem state to introduce legal changes even remotely affecting its non-Moslem population, alien or subject, without the consent of the European embassies. Any change may be upset by their refusal to accept it as incompatible with the capitulations and conventions. The embassies have thus, as interpreters of a part, at least, of the constitution, come to hold a position remarkably, if absurdly, like that of the Supreme Court of the United States (see Young, *Corps de droit Ottoman, passim*).

There may be said, then, in short, to be three elements in the legal life of a Moslem state: the sacred and fixed canon law of Islam; the civil law, based on the usages of the different peoples, Moslem and non-Moslem, and on statutes going back to the will of rulers; the international law of the capitulations, with a contractual sanction of its own. The hope for the future in Islam, there can be little doubt, lies in the principle of the agreement of the Moslem people, with its conception of catholic unity, and its ability, through that unity, to make and abrogate laws. As the Moslem peoples advance, their law can, thus, advance with them, and the grasp of the dead hand of the canon law be gradually and legally released.

See I. Goldziher, *Muhammedanische Studien*, I. and II. (Halle a.S., 1889-1890); *Zahiriten* (Leipzig, 1884); E. Sachau, *Zur ältesten Geschichte des muhammedanischen Rechts* (Vienna Akad., 1870) and *Muhammedanisches Recht* (Stuttgart and Berlin, 1897); Snouck Hurgronje, review of preceding in *Z.D.M.G.* liii. 125 seq. and "Le droit musulman" (*Rev. de l'hist. des religions*, xxxvii. 1 seq. and 174 seq.); Juynboll, *Handleiding tot de Kennis von de mohammedaansche Wet* (Leiden, 1903); Von Kremer, *Culturgeschichte des Orients unter den Chalifen*, i. 470 seq. (Vienna, 1875-1877); Hughes, *Dictionary of Islam*, pp. 285 seq. (London, 1896); D. B. Macdonald, *Development of Muslim Theology*, &c., pp. 65 seq. (New York, 1903); Bukhari, *Les Traditions islamiques traduites ... par O. Houdas et W. Marcel* (Paris, 1906); N. B. E. Bailie, *Digest of Moohummadan Law* (2 vols., London, 1875-1887). A good bibliography appeared in the *Bulletin of the New York Public Library* for January 1907.

(D. B. Ma.)

MAHOMMEDAN RELIGION.

The Mahommedan religion is generally known as *Islam*—the name given to it by Mahomet himself—and meaning the resigning or submitting oneself to God. The participle of the same Arabic verb, *Muslim* (in English usually spelt Moslem), is used for one who professes this religion. The expression "Mahommedan religion" has arisen in the West probably from analogy with "Christian religion," but is not recognized as a proper one by Moslem writers. Islam claims to be a divinely revealed religion given to the world by Mahomet, who was the last of a succession of inspired prophets. Its *doctrine* and *practices* are to be found in (i) the Book of God—the Koran—which was sent down from the highest heaven to Gabriel in the lowest, who in turn revealed it in sections to Mahomet; (2) the collections of tradition (*ḥadīth*) containing the sayings and manner of life (*sunna*) of the Prophet; (3) the use of analogy (*qiyās*) as applied to (i) and (2); and (4) the universal consent (*ijmā'*) of the believers. The *worship* of Islam consists in (1) the recital of the creed; (2) the recital of the ordained prayers; (3) the fast during the month of Ramadhān; (4) alms-giving; (5) the *ḥajj*, the pilgrimage to Mecca. The *theology* of Islam finds its first public expression among the orthodox in the teaching of al-Ash'arī (d. after 932), but had its real beginning among the sects that arose soon after the death of Mahomet.

Islam is the latest of the so-called world-religions, and as several of the others were practised in Arabia at the time of Mahomet, and the Prophet undoubtedly borrowed some of his doctrines and some of his practices from these, it is necessary to enumerate them and to indicate the extent to which they prevailed in the Arabian world.

Relations with Other Religions.—The religions practised in Arabia at the time of Mahomet were heathenism, Judaism, Christianity, and Zoroastrianism.

i. *Heathenism* was the religion of the majority of the Arabs. In the cities of south Arabia it was a survival from the forms represented in the Sabaean, Minaean and Himyaritic inscriptions of south Arabia (see Arabia: *Antiquities*). The more popular form current among the nomads is known very imperfectly from the remains of pre-Islamic poetry and such works as the *Kitāb ul-Aṣnām* contained in Yaqūt's geography, from Shahrastānī's work on the sects, and from the few references in classical writers. From these we have mostly names of local deities (cf. J. Wellhausen, *Reste arabischen Heidentums*, 2nd ed., Berlin, 1897) and ancient religious customs, which remained in part after the introduction of Islam (cf. W. Robertson Smith, *The Religion of the Semites*, Edinburgh, 1889, and *Kinship and Marriage in Early Arabia*, Cambridge, 1885). From these sources we learn that Arabian religion was a nature-worship associated with fetishism. Sun, moon and stars were worshipped, some tribes being devoted to the worship of special constellations. Certain stones, wells and trees were regarded as sacred and as containing a deity. Many (perhaps most) tribes had their own idols. Hobal was the chief god of the Ka'ba in Mecca with its sacred stone, but round him were grouped a number of other tribal idols. It was against this association (*shirk*) of gods that Mahomet inveighed in his attempt to unify the religion and polity of the Arabs. But there were features in this heathenism favourable to unity, and these Mahomet either simply took over into Islam or adapted for his purpose. The popularity of the Ka'ba in Mecca as a place of resort for worshippers from all parts of Arabia led Mahomet not only to institute the *ḥajj* as a duty, but also to take over the customs connected with the heathen worship of these visits, and later to make Mecca the *qibla*, *i.e.* the place to which his followers turned when they prayed. The name of Allah, who seems to have been the god of the Koreish (cf. D. S. Margoliouth, *Mohammed*, p. 19, London, 1905), was accepted by Mahomet as the name of the one God, though he abandoned the corresponding female deity Al-lāt.

2. *Judaism* had long been known in Arabia at the time of the Prophet. Whether Hebrews settled in Arabia as early as the time of David (cf. R. Dozy, *Die Israeliten zu Mecca*, Leipzig, 1864), or not, is of little importance here as Judaism cannot be said to have existed until the end of the 5th century B.C. The Seleucid persecutions and the political troubles that ended with the fall of Jerusalem (A.D. 70) probably sent many Jews to Arabia. In the 5th and 6th centuries the history of south Arabia and of Nejrān is largely that of the strife between Jews and Christians. In the north-west the Jews possessed Temā, Khaibar, Yathrib (Medina), Fadak, and other smaller settlements. In these they lived as self-contained communities, not seeking to proselytize but working at their trades, especially concerned with money and jewelry. Mahomet seems to have expected their help in his proclamation of monotheism, and his first *qibla* was Jerusalem. It was only when they refused to accept him as prophet that he turned in anger against them. They had, however, supplied him with much material from the Old Testament, and the stories of creation, the patriarchs and early kings and prophets occur continually in the Koran, told evidently as they were recited by the common people and with many mistakes caused by his own misunderstanding.

3. *Christianity*, though later than Judaism, had a sure footing in Arabia. It had suffered persecution in Nejrān and had been supported in the south by the Abyssinian invasions. The kingdom of Hira was largely Christian; the same is true of the north Arabian tribes of Bakr and Taghlib, and east of the Jordan and on the Syrian boundary as well as in Yemāma Christianity had made progress. Pre-Islamic literature contains many allusions to the teaching and practices of Christianity. Of the time of its introduction little is known; little also of the form in which it was taught, save that it came from the Eastern Church and probably to a large extent through Monophysite and Nestorian sects. Tradition says that Mahomet heard Christian preaching at the fair of Ukaz, and he probably heard more when he conducted the caravans of Khadija. Gospel stories derived apparently from uncanonical works, such as the Gospel of the Nativity, occur in the Koran. The asceticism of the monks attracted his admiration. A mistaken notion of the Trinity was sharply attacked by him. It is curious that his followers in the earliest times were called by the heathen Arabs, Sabians (*q.v.*), this being the name of a semi-Christian sect. In the time of the Omayyads Christianity led to some of the earliest theological sects of Islam (see below).

4. *Zoroastrianism* was known to the Arab tribes in the north-east, but does not seem to have exercised any influence in Mecca or Medina except indirectly through Judaism in its angelology. As soon, however, as the armies of Islam conquered Mesopotamia it began to penetrate the thought and practices of Islam (see below).

Sources of Authority.—Islam, as we have said, is founded on: (1) the Koran; (2) the tradition or rather the *sunna* (manner of life of Mahomet) contained in the tradition (*Ḥadith*); (3) *ijmā'*; the universal agreement; (4) *qiyās* (analogy).

1. The *Koran*[1] (properly *Qur'ān* from *qara'a* to collect, or to read, recite) is the copy of an uncreated original preserved by God (see below), sent down from the seventh heaven to Gabriel in the first heaven, and revealed to Mahomet in sections as occasion required. These revelations were recited by the Prophet and in many cases written down at once, though from ii. 100 it would seem that this was not always the case. God is the speaker throughout the revelations. It seems probable that the whole Koran was written in Mahomet's lifetime, but not brought together as a whole or arranged in order.

As it exists now the Koran consists of 114 chapters called *suras* (from *sura*, a row of bricks in a wall, a degree or step). The first is the *Fātiḥa* (opening), which occupies the place of the Lord's Prayer in Christianity. The others are arranged generally in order of length, the longest coming first, the shortest (often the earliest in date) coming at the end. Certain groups, however, indicated by initial unvowelled letters, seem to have been kept together from the time of the Prophet. At the head of each *sura* is a title, the place of its origin (Mecca or Medina) and the number of its verses (*āyāt*) together with the formula, "In the name of God the Merciful, the Compassionate" (except in *sura 9*). For liturgical purposes the whole book is divided into 60 sections (*aḥzāb*) or into 30 divisions (*aj̲zā*), each subdivided into a number of prostrations (*ruk'a* or *sajda*). The origin of the collected and written Koran is due to Omar, who in the caliphate of Abū Bekr pointed out that many possessors of *suras* were being slain in the battles of Islam and their property lost, that there was a danger in this way that much of the revelation might disappear, and that men were uncertain what was to be accepted as genuine

revelation. Accordingly Zaid ibn Thābit who had been secretary to Mahomet, was commissioned to collect all he could find of the revelation. His work seems to have been simply that of a collector. He seems to have done his work thoroughly and made a copy of the whole for Abū Bekr. The collection was thus chiefly a private matter, and this copy passed after Abū Bekr's death into the hands of Omar, and after his death to Ḥafṣa, daughter of Omar, a widow of Mahomet. In the caliphate of Othman it was discovered that there were serious differences between the readings of the Koran possessed by the Syrian troops and those of the Eastern soldiers, and Othman was urged to have a copy prepared which should be authoritative for the Moslem world. He appointed Zaid ibn Thābit and three members of the tribe of Koreish (Quraish) to do the work. Each of these made a copy of Abū Bekr's collection, carefully preserving Koreishite forms of words. How far the text was amended by the help of other copies is doubtful; in any case the mode of procedure was undoubtedly very conservative. The four similar manuscripts were sent, one each to Medina, Cufa (Kufa), Basra and Damascus, and an order was issued that all differing copies should be destroyed. In spite of the personal unpopularity of Othman this recension was adopted by the Moslem world and remains the only standard text. A few variant readings and differences of order of the *suras* in the collections of Ubay ibn Ka'b and of Ibn Mas'ūd were, however, known to later commentators. The only variants after the time of Othman were owing to different possible ways of pronouncing the consonantal text. These are usually of little importance for the meaning. As the text is now always vowelled, variations are found in the vowels of different copies, and the opinions of seven leading "readers" are regarded as worthy of respect by commentators (see Th. Nöldeke, *Geschichte des Qorāns*, pp. 279 seq., Göttingen, 1860). Various characteristics enable one to establish with more or less certainty the relative chronological order of the *suras* in the Koran, at any rate so far as to place them in the first or second Meccan period or that of Medina. The form of the sentences is a guide, for the earliest parts are usually written in the *saj'* form (see Arabia: *Literature*). The expressions used also help; thus the "O ye people" of the Meccan period is replaced in the Medina *suras* by "O ye who believe." The oaths in the first Meccan period are longer, in the second shorter, and are absent in the Medinan. In the earliest period the style is more elevated and passionate. Occasionally the time of origin is determined by reference to historical events. In accordance with such principles of criticism two leading scholars, Nöldeke (*loc. cit.*) and H. Grimme (in his *Mohammed Zweiter Teil. Einleitung in den Koran. System der koranischen Theologie*, Münster, 1895), have arranged the *suras* as follows:—

Order of Suras in Koran.

Nöldeke.	
Mecca.	
1st to 5th yr. (*a*).	96. 74. 111. 106. 108. 104. 107. 102. 105. 92. 90. 94. 93. 97. 86. 91. 80. 68. 87. 95. 103. 85. 73. 101. 99. 82. 81. 53. 84. 100. 79. 77. 78. 88. 89. 75. 83. 69. 51. 52. 56. 70. 55. 112. 109. 113. 114. 1.
5th and 6th yr. (*b*).	54. 37. 71. 76. 44. 50. 20. 26. 15. 19. 38. 36. 43. 72. 67. 23. 21. 25. 17. 27. 18.
7th yr. to Flight (*c*).	32. 41. 45. 16. 30. 11. 14. 12. 40. 28. 39. 29. 31. 42. 10. 34. 35. 7. 46. 6. 13.
Medina.	2. 98. 64. 62. 8. 47. 3. 61. 57. 4. 65. 59. 33. 63. 24. 58. 22. 48. 66. 60. 110. 49. 9. 5.
Grimme.	
Mecca, (1).	[2] In old saj' form: 111. 107. 106. 105. 104. 103. 102. 101. 100. 99. 108. 96. 95. 94. 93. 92. 91. 90. 89. 88. 87. 86. 85. 84. 83. 82. 81. 80. 79. 78. 77. 76. 75. 74. 73. 70. 69. 68. 114. 113. 36. 55. 54. 53. 52. 51. 50. 15. 22. 14.
(2).	In loosened *saj'* form: 46. 72. 45. 44. 41. 97. 40. 39. 38. 37. 36. 35. 34. 32. 31. 67. 30. 29. 28. 27. 26. 71. 25. 20. 23. 43. 21. 19. 1. 42. 18. 17. 16. 13. 12. 11. 10. 7. 6. 98. (112. 109).
Medina.	
From the Flight to Badr.	2. 62. $5_{15.88.108\text{-}120}$. 47 and some interpolations in Meccan *suras*.
From Badr to Ohod	8. 24. 59.
From Ohod to capture of Mecca.	3. $29_{1\text{-}12}$. 4. 57. 64. 61. 60. 58. 65. 33. 63. 49. 110. 48. $5_{1\text{-}14}$. 66. $9_{1\text{-}24}$.
After capture of Mecca.	$9_{25\text{-}124}$.

Theology.

On the supposition that the arrangements given above are at any rate approximately correct, it is possible to trace a certain development in the teaching of the Koran on some of the chief dogmas. It must, however, be borne in mind that orthodox Islam recognizes the Koran as the work not of Mahomet but of God. Yet Moslem theologians recognize that some revelations are inconsistent with others, and so have developed the doctrine of *nāsikh* and *mansūkh* ("abrogating" and "abrogated"), whereby it is taught that in certain definite cases a later revelation supersedes an earlier. A critical study of the Koran shows in the earlier revelations the marks of a reflective mind trained under the influence of Arabian education and stirred by an acquaintance (somewhat imperfect) with Judaism and Christianity. The later revelations seem to be influenced by the now dominant position of the Prophet and a desire after the capture of Mecca to incorporate such heathen religious ceremonies as are national. God is one and universal from the beginning. His unity is emphasized as against the mistaken conception of the Christian Trinity. At first his might is taught by the name *Rabb* (Lord) which is generally used with an attribute as "the highest Lord," "Lord of the worlds," "Lord of men," "Lord of heaven and earth," "Lord of the East and West," or "our Lord." Then he is identified with the god Allah (see above) and the first part of the later Moslem creed is announced—*la ilaha illa-llaha*, "there is no god but Allah." But every act of creation is a proof not only of God's power but also of his beneficence (xiv. 37), and so he becomes known as *ar-Raḥmān*, "the Compassionate." The attributes of God may all be arranged in the three classes of his power, unity and goodness. They are expressed by the ninety-nine "beautiful names" applied to him in the Koran (see E. H. Palmer, *The Quran* in "Sacred Books of the East," vol. vi., Introd. pp. 67-68, Oxford, 1880). In the Medina period of Mahomet's life the nature of God is not so clear, and the description of it varies according to the moods of the Prophet.

Beside God are two other uncreated beings: (1) the original of the Koran, the "mother of the Book" (xliii. 3) on a "preserved tablet" (*lauḥ maḥfūẓ*) (lxxxv. 22), in accordance with which God acts, and (2) the throne (*kursī*) (ii. 256). When the heavens are created, God sits on his throne in the seventh heaven; around him are angels, pure, sexless beings, some of whom bear the throne, while some are engaged in praising him continually. They are also his messengers and are sent to fight with the believers against the heathen. Some are the guardian angels of men, others are the watchmen of hell. Mediate beings between God and man are the "word" (*amr*) and from it the "spirit" (*rūḥ*) or "holy spirit" (*rūḥ ul-qudus*). Another manifestation of God to the believers only is the "glory" (*sakīna*).

Spirits.

God created the world in six days according to the plan of the Book. Each new life was created by God's breathing into it a soul. The duality of soul and body is maintained. In each man is a good and a bad impulse. The bad impulse which was latent in Adam was roused to action by Satan (*Iblīs*). Adam by his fall lost the grace of God, which was restored to him solely by the gracious choice of God. Between men and angels in their nature are the genii (*jinn*) male and female, inhabitants of desert places, created from smokeless fire. They had been accustomed to spy round heaven, but in Mahomet's time could learn no more of its secrets. Some of them were converted by the Prophet's teaching. Lowest of creation in his estate is Satan (*Shaitān*), who was an angel but was expelled from heaven because he refused to worship Adam at his Lord's command. God has revealed himself to man by (1) writing (*kitāb*), and (2) prophets. As he had given to the Jews the Law (*Taurāt*) and to the Christians the Gospel (*Injīl*) so he revealed to Mahomet the Koran (Qur'ān, known also by other names, *e.g. al-Furqān*, *at-Tafṣīl*, &c.), each single revelation being called an aya. With his revelation God has also sent an apostle or prophet to each people. Several of these are mentioned in the Koran, Moses the prophet of the Jews, Jesus (*Īsā*) that of the Christians. Mahomet is not only the apostle of the Moslems but the "seal of the prophets," *i.e.* the final member of the class. His mission at first was to warn men of imminent judgment. Later he became more of a teacher. At first he seems to have relied for the salvation of men on his natural faculties, but later announced the doctrine of God's election. The ethics of the Koran are based on belief (*imān*) and good works, the latter alone occurring in the early Meccan *suras*. Fear of the judgment of God was a motive of action; this is followed by repentance and turning to God. A complete surrender to God's will (*islām*) is the necessary condition of religious life and is expressed in the phrase so common in everyday speech among the Moslems—*inshallah*, "if God will." God has full power to overlook evil deeds if he will. Unbelievers can acquire no merit, however moral their actions. A short account of the chief ethical requirements of the Koran is given in xvii. 23-40:—

Cosmology.

Ethics.

> "Put not God with other gods, or thou wilt sit despised and forsaken. Thy Lord has decreed that ye shall not serve other than Him; and kindness to one's parents, whether one or both of them reach old age with thee, and say not to them, 'Fie,' and do not grumble at them, but speak to them a generous speech. And lower to them the wing of humility out of compassion, and say, 'O Lord! have compassion on them as they brought me up when I was little!' Your Lord knows best what is in your souls if ye be righteous, and, verily, He is forgiving unto those who come back penitent.
>
> "And give thy kinsman his due and the poor and the son of the road; and waste not wastefully, for the wasteful were ever the devil's brothers, and the devil is ever ungrateful to his Lord.
>
> "But if thou dost turn away from them to seek after mercy from thy Lord, which thou hopest for, then speak to them an easy speech.
>
> "Make not thy hand fettered to thy neck, nor yet spread it out quite open, lest thou shouldest have to sit down blamed and straightened in means. Verily, thy Lord spreads out provision to whomsoever He will or He doles it out. Verily, He is ever well aware of and sees His servants.
>
> "And slay not your children for fear of poverty; we will provide for them; beware! for to slay them is ever a great sin.
>
> "And draw not near to fornication; verily, it is ever an abomination, and evil is the way thereof.
>
> "And slay not the soul that God has forbidden you, except for just cause; for he who is slain unjustly we have given his next of kin authority; yet let him not exceed in slaying; verily, he is ever helped.
>
> "And draw not near to the wealth of the orphan, save to improve it, until he reaches the age of puberty, and fulfil your compacts; verily, a compact is ever enquired of.
>
> "And give full measure when ye measure out, and weigh with a right balance; that is better and a fairer determination.
>
> "And do not pursue that of which thou hast no knowledge; verily, the hearing, the sight and the heart, all of these shall be enquired of.
>
> "And walk not on the earth proudly; verily, thou canst not cleave the earth, and thou shalt not reach the mountains in height.
>
> "All this is ever evil in the sight of your Lord and abhorred."
>
> (E. H. Palmer's translation.)

The eschatology of the Koran is especially prominent in its earlier parts. The resurrection, last judgment, paradise and hell are all described. At death the body again becomes earth, while the soul sinks into a state of sleep or unconsciousness. At a time decreed, known as "the hour" (*as-Sa'a*), "the day of resurrection" (*yaum ul-qiyyāma*), "day of judgment" (*yaum-ud-dīn*), &c., an angel will call or will sound a trumpet, the earth will be broken up, and the soul will rejoin the body. God will appear on his throne with angels. The great book will be opened, and a list of his deeds will be given to every man, to the good in his right hand, to the evil in his left (*sura* 69). A balance will be used to weigh the deeds. The *jinn* will testify against the idolaters. The righteous will then obtain eternal peace and joy in the garden (*al-janna*) and the wicked will be cast into the fiery ditch (*Jahannam*), where pains of body and of soul are united.

Eschatology.

2. The *Tradition*.—The revelation of God is twofold—in a writing and by a prophet. The former was contained

in the Koran, the latter was known from the actions of Mahomet in the different circumstances of life. The manner of life of the Prophet (*sunna*) was contained in the tradition (*al-ḥadith*). The information required was at first naturally obtained by word of mouth from the companions and helpers of Mahomet. These in turn bequeathed their information to their younger companions, who quoted traditions and gave decisions in their names.

For long these traditions circulated orally, the authority of each depending on the person who first gave it and the reliability of the chain (*isnād*) of men who had passed it on from him. At first this tradition was regarded as explanatory of, or at the most supplementary to, the teaching of the Koran. Early Moslem teachers pointed to the Jews as having two law-books—the *Taurāt* and the *Mishna*—while Islam had only one—the Koran. But opinion changed, the value of tradition as an independent revelation came to be more highly esteemed until at last it was seriously discussed whether a tradition might not abrogate a passage of the Koran with which it was at variance. The writing of traditions was at first strongly discouraged, and for more than a century the stories of the Prophet's conduct passed from mouth to mouth. Had all the narrators been pious men, this might have been tolerable, but this was not the case. The Omayyad dynasty was not a pious one. Men who were not religious but wished to appear so invented traditions to justify their manner of life. The sectarians did not hesitate to adopt the same means of spreading their own teaching. Many Moslem writers testify to the fact that forged traditions were circulated, and that religious opinion was confused thereby. The need for some sort of authoritative collection seems to have been felt by the one pious Omayyad caliph, Omar II. (717-720), who is said to have ordered Ibn Shihāb uz-Zuhrī to make such a collection. Of this work, if it was carried out, we know nothing further. It was, however, by a man born during this reign that the first systematic collection of traditions was made—the *Muwatta'* of Mālik ibn Anas (*q.v.*). Yet this work is not a book of tradition in the religious sense, it is really a corpus juris and not a complete one. The object of Mālik was simply to record every tradition that had been used to give effect to a legal decision. The work of sifting the vast mass of traditions and arranging them according to their relation to the different parts of religious life and practice was first undertaken in the 3rd century of Islam (A.D. 815-912). In this century all the six collections afterwards regarded as canonical by the Sunnites (orthodox) were made. By this time an immense number of traditions was in circulation. Bukhārī in the course of sixteen years' journeying through Moslem lands collected 600,000, and of these included 7275 (or, allowing for repetitions, 4000) in his work. The six collections of tradition received by the Sunnites as authoritative are: (i) The *Kitāb ul-jāmi' uṣ-Ṣaḥīḥ* of Bukhārī (*q.v.*) (810-870). This is the most respected throughout the Moslem world and most carefully compiled (ed. L. Krehl and T. W. Juynboll, Leiden, 1862—and frequently in the East; also with many commentaries. French translation by O. Houdas and W. Marcais, Paris, 1903 sqq.). (ii) The *Ṣaḥīḥ* of Muslim (817-875) with an introduction on the science of tradition (ed. Calcutta, 1849, &c.). (iii) The *Kitāb uṣ-Sunan* of Abū Dā'ūd (817-888) (ed. Cairo, 1863, Lucknow, 1888, Delhi, 1890). (iv) The *Jāmi' uṣ-Ṣaḥīḥ* of Tirmidhī (*q.v.*). (v) *The Kitāb uṣ-Sunan* of Nasā' ī (830-915) (ed. Cairo, 1894). (vi) The *Kitāb uṣ-Sunan* of Ibn Māja (824-866) (ed. Delhi, 1865 and 1889). The last four are not held in the same repute as the first two.

3. *Ijmā'* is the universal consent which is held to justify practices or beliefs, although they are not warranted by the Koran or tradition, and may be inconsistent with the apparent teaching of one or both of these. These beliefs and practices, which had often come from the pre-Islamic customs of those who had become believers, seem to have escaped notice until the Abbasid period. They were too deeply rooted in the lives of men to be abolished. It became necessary either to find a tradition to abrogate the earlier forbidding one, or to acknowledge that *ijmā'* is higher than the tradition. The former expedient was resorted to by some later theologians (*e.g.* Nawāwī) by a fiction that such a tradition existed though it was not found now in writing. But in earlier times some (as Ibn Qutaiba) had adopted the latter alternative, saying that the truth can be derived much earlier from the *ijmā'* than from the tradition, because it is not open to the same chances of corruption in its transmission as the latter. Tradition itself was found to confirm this view, for the Prophet is related to have said, "My people does not agree to an error."

But *ijmā'* itself has been used in different senses: (i) The *ijmā'* of Medina was used to indicate the authority coming from the practices of the people of Medina (see below). (ii) The *ijmā'* of the whole community of Moslems is that most commonly recognized. It was used to support fealty to the Abbasid dynasty. By it the six books of tradition mentioned above are recognized as authoritative, and it is the justification of the conception of Mahomet as superhuman. (iii) Some of the more thoughtful theologians recognize only the *ijmā'* of the doctors or the teachers of Islam (the *mujtahidūn*), these being restricted by the orthodox to the first few generations after Mahomet, while the Shi'ites allow the existence of such up to the present time.

4. The fourth basis of Islam is *qiyās*, *i.e.* analogy. It is that process by which a belief or practice is justified on the ground of something similar but not identical in the Koran, the tradition or *ijmā'*. Originally it seems to have been instituted as a check upon the use of private opinion (*ra'y*) in the teaching of doctrine. The extent to which it may be used is a subject of much discussion among theologians. Some would apply it only to a "material similarity," others to similarity of motive or cause as well.

Worship and Ritual.—The acts of worship required by Islam are five in number: (i) the recital of the creed; (ii.) observance of the five daily prayers; (iii) the fast in the month of Ramadhān; (iv) giving of the legal alms; (v) the pilgrimage to Mecca.

Creed.

i. The creed is belief—"la ilaha illa-llahu, Muḥammad rasūl allahi," "there is no god but God (Allah), Mahomet is the apostle of God." It is required that this shall be recited at least once in a lifetime aloud, correctly, with full understanding of its meaning and with heartfelt belief in its truth. It is to be professed without hesitation at any time until death.

Prayer.

ii. Every man who professes Islam is required in ordinary life to pray five times in each day. In the Koran these prayers are commanded, though four only are mentioned. "Wherefore glorify God, when the evening overtaketh you, and when ye rise in the morning, and unto Him be praise in Heaven and earth; and in the evening and when ye rest at noon" (xxx. 16-17), but commentators say the "evening" includes the sunset and after sunset. The five times therefore are: (1) Dawn or just before sunrise, (2) just after noon, (3) before sunset, (4) just after sunset, and (5) just after the day has closed. Tradition decides within what limits the recitals may be delayed without impairing their validity. Prayer is preceded by the lesser ablution (*waḍū*) consisting in the washing of face, hands (to the elbows) and feet in prescribed manner. Complete washing of the body (*ghusl*) is required only after legal pollution. In prayer the

worshipper faces the *qibla* (direction of prayer), which was at first Jerusalem, but was changed by the Prophet to Mecca. In a mosque the *qibla* is indicated by a niche (*miḥrab*) in one of the walls. The prayers consist of prescribed ejaculations, petitions, and the recital of parts of the Koran, always including the first *sura*, accompanied by prostrations of the body. Detailed physical positions are prescribed for each part of the worship; these vary slightly in the four orthodox schools (see below). On a journey, in time of war or in other special circumstances, the set form of prayers may be modified in accordance with appointed rules. Besides these private prayers, there is the prayer of the assembly, which is observed on a Friday (*yaum ul-jam'a*, "the day of assembly") in a mosque, and is usually accompanied by an address or declamation (*khutba*) delivered from a step of the pulpit (*minbar*). Special prayers are also prescribed for certain occasions, as on the eclipse of the sun or the moon, &c. Among the Sūfis special attention is given to informal prayer, consisting chiefly in the continual repetition of the name of God (*dhikr*) (see Sufi'ism). This is still a characteristic of some of the dervish (*q.v.*) communities.

Fasting.

iii. The command to fast begins with the words, "O ye who believe! There is prescribed for you the fast, as it was prescribed for those before you." The expression "those before you" has been taken to refer to the Jews, who fasted on the day of atonement, but more probably refers to the long fast of thirty-six days observed by the Eastern Christians. In the passage of the Koran referred to (ii. 179-181) Moslems are required to fast during the month of Ramadhān, "wherein the Koran was revealed," but if one is on a journey or sick he may fast "another number of days," and if he is able to fast and does not, "he may redeem it by feeding a poor man," but "if ye fast, it is better for you." This fast was probably instituted in the second year at Medina. At that time the corrected lunar year was in use and Ramadhān, the ninth month, was always in the winter. A few years later Mahomet decreed the use of the uncorrected lunar year, which remains the standard of time for the Moslem world, so that the month of fasting now occurs at all seasons of the year in turn. The fast is severe, and means entire abstinence from food and drink from sunrise to sunset each day of the month. The fast is associated with the statement that in this month God sent down the Koran from the seventh heaven to Gabriel in the lowest that it might be revealed to the Prophet.

Alms.

iv. Alms are of two kinds: (1) the legal and determined (*zakāt*), and (2) voluntary (*ṣadaqāt*). The former were given in cattle, grain, fruit, merchandise and money once a year after a year's possession. For cattle a somewhat elaborate scale is adopted. Of grain and fruit a tenth is given if watered by rain, a twentieth if the result of irrigation. Of the value of merchandise and of money a fortieth is prescribed. In the early days of Islam the alms were collected by officials and used for the building of mosques and similar religious purposes. At the present time the carrying of these prescriptions is left to the conscience of the believers, who pay the alms to any needy fellow-Moslem. A good example of a *ṣadaqā* is found in a gift to an unbeliever (see C. M. Doughty, *Arabia deserta*, i. 446, ii. 278, Cambridge, 1888).

Pilgrimage.

v. The fifth religious duty of the Moslem is the pilgrimage (*ḥajj*) to Mecca, which should be performed once by every Moslem "if he is able," that is if he can provide or obtain the means to support himself on pilgrimage and his family during his absence, and if he is physically capable. The pilgrimage is made at one time of the (Moslem) year, namely, from the 7th to the 10th of the month Dhu'l-Hijja. For the arrangements for the journey from various countries to Mecca see Caravan. When the pilgrim arrives within five or six miles of the holy city he puts off his ordinary dress after ablution and prayer, and puts on the two seamless wrappers which form the dress of the pilgrim (the *iḥrām*), who goes without head-covering or boots or shoes. He must not shave at all, or trim the nails or anoint the head during the ceremonial period. The chief parts of the ceremonial are the visit to the sacred mosque (*masjīd ul-ḥarām*), the kissing of the black stone, the compassing of the Ka'ba (the *Ṭawāf*) seven times, three times running, four times slowly, the visit to the Maqām Ibrahīm, the ascent of Mount Ṣafā and running from it to Mount Marwa seven times, the run to Mount 'Arafāt, hearing a sermon, and going to Muzdalifa, where he stays the night, the throwing of stones at the three pillars in Minā on the great feast day, and the offering of sacrifice there (for the localities see Mecca). After the accomplishment of these ceremonies the ordinary dress is resumed, the pilgrimage is finished, but the pilgrim usually remains another three days in Mecca, then visits Medina to pay his respects to the tomb of Mahomet. Beside the *ḥajj* (great pilgrimage) Islam also recognizes the merit of the *'umra* (or lesser pilgrimage), *i.e.* a religious visit to Mecca at any time accompanied by most of the ceremonies of the *ḥajj*.

The ceremonies of the *ḥajj* have been described by several European travellers who have witnessed them, such as J. L. Burckhardt in 1814, Sir Richard Burton in 1853 (see bibliography to Mecca). A concise account of them is given in T. P. Hughes, *Notes on Muhammadanism* (3rd ed., London, 1894). Details in vol. i. of Bukhārī's traditions (Houdas and Marcais's French translation, i. 493-567).

The Development of Islam.—The battle of Siffīn (657) between 'Ali and Moawiya was the occasion of the first breach in the unity of Islam, and the results remain to this day. The occasion was in the first case political, but politics were at that time too intimately connected with religion to be considered apart from it. After the battle (see Caliphate) 'Alī was practically compelled to submit his claims to arbitration, whereupon a number of his supporters broke away from him, saying that there should have been no appeal save to the Book of God. These men were for the most part country Arabs, and, inspired by the free spirit of the desert, were democratic, claiming that the caliph should be elected by the whole community from any family (and not from the Koreish alone), and that the caliph might be deposed for sin. A few extremists were republicans and would do without a caliph altogether. The whole party was known as the Kharijites (Khārijiyya or Khawārij). The Moslems who disagreed with them were regarded by them as renegades and were to be put to death. They were soon divided into extremists and moderates. The former put to death the children of unbelievers and refused to hold intercourse in daily life with unbelievers. The moderates, who came to be known as Ibadites (from their leader 'Abdallah ibn 'Ibād), would allow the children of unbelievers to grow up, and would then deal with them according to their choice. In ordinary life they would mix with all men, but marriage with other Moslems outside their own ranks was forbidden. These still remain in Oman, parts of Algeria and East Africa.

Another party, consisting mainly of city Arabs infected with Persian ideas as to the divinity of the ruler, clung to 'Alī with inconvenient affection. They regarded 'Alī and his descendants as the only legitimate caliphs, and came to be known as Shi'ites (*q.v.*). They remain to-day the largest part of Islam outside orthodoxy. During the Omayyad caliphate (661-750) there were three centres of religious thought and influence; students and teachers often passed from one to the other, thus making universal the teachings which in their origin were due to local circumstances. These centres were Damascus (the seat of the caliphate), Medina and the

East (Irak, &c.). In Damascus the court was worldly and indifferent to the interests of Islam. The early Omayyads were distinguished for their striving after dominion (*mulk*). Instead of attempting to propagate Islam, they tolerated other religions and favoured Christians who were distinguished as poets (*e.g.* Akhtal) or officials (John of Damascus), or men likely to be of use to them in any way. The doctrines of Christianity began to influence even serious Moslems and to affect their way of stating Moslem belief. John of Damascus (d. before 767), the Greek theologian, and his pupil, Theodorus Abucara (d. 826), have written controversial works on Islam, from which it seems probable that disputations on subjects pertaining to religion were held between Christians and Moslems. Two schools of heretical Moslem sects arose under these influences—that of the Murjiites and that of the Qadarites. The Murjiites ("postponers") were so called because they postponed the judgment of human actions until the Day of Judgment. In politics they accepted the Omayyads as *de facto* rulers, since they were Moslems, and left the judgment of their actions to God. As theologians they taught that religion consists in belief (*imān*) in the unity of God and in his apostle, and in that alone, consequently no one who held this faith would perish eternally, though he had been a sinner. This was opposed to the Khārijite doctrine that the unrepentant sinner would perish eternally, even though he had professed Islam.

The Qadarites were concerned with the doctrine of predestination and free-will. So long as Moslems were fighting the battles of Islam they naturally paid most attention to those revelations which laid stress on the absolute determination of a man's destiny by God. They fought with great bravery because they believed that God had foreordained their death or life and they could not escape His will. In the quieter realm of town and court life and in their disputations with Christians they were called upon to reconcile this belief with the appeals made in the Koran to man's own self-determination to good, to courage, &c. Mahomet was not a systematic theologian and had done nothing to help them. The Qadarites declared that man had power over his own actions. But the teaching of predestination had gained too great a hold on Moslems to be thus displaced. The teaching of the Qadarites was held to be heresy, and one of its first professors, Ma'bad ul-Juhānī, was put to death in 699.[3] During this period Medina was the home of tradition. Those who had been in closest relation with the Prophet dwelt there. The very people of the city derived a certain splendour and authority from the fact that Mahomet had lived and was buried there. Free thought in religion had little chance of arising, less of expressing itself, in the holy city. But the Koran was diligently studied, traditions were collected (and invented) though not yet written in books, and innovation (*bid'a*) was resolutely avoided. At the same time it really did contribute a new element to religious practice, for the custom (*ijmā'*, see above) of Medina gained a certain authority even in Syria and the East.

In the East, on the other hand, there was more mental activity, and the religious teachers who came from Medina had to be prepared to meet with many questions. The wits of the Moslems were sharpened by daily contact with Christians, Buddhists, Manichaeans and Zoroastrians. Ḥasan ul-Baṣrī (*q.v.*), who has been claimed as one of the first mystics, also as one of the first systematic theologians of Islam, was remarkable alike for his personal piety and his orthodoxy. Yet it was among his pupils that the great rationalist movement originated. Its founder was Wāṣil ibn 'Atā, who separated himself (whence his followers were called Motazilites, strictly Mu'tazilites, "Separatists") from his teacher and founded a school which became numerous and influential. The Mu'tazilites objected to the attributes of God being considered in any way as entities beside God; they explained away the anthropomorphisms used in speaking of the deity; they regarded the Koran as created and as a product of Mahomet writing under the divine influence. Briefly, they asserted the supremacy of reason (*'aql*) as distinct from faith received by tradition (*naql*). They also called themselves "the people of justice and unity" (*Ahl ul-'adl wat-tauḥīd*). Such a faith as this naturally found favour rather with the thinking classes than with the uneducated multitude, and so went through many vicissitudes. At the time of its appearance and until the reign of Ma'mūn its adherents were persecuted as heretics. After discussions among the theologians Ma'mūn took the decided step of proclaiming that the Koran was created, and that a belief in this dogma was necessary. Other Mu'tazilite doctrines were proclaimed later. Mu'tazilites were appointed to official posts, and an inquisition (*mīḥna*) was appointed to enforce belief in their doctrines. This movement was strongly opposed by the orthodox and especially by Aḥmad ibn Hanbal (*q.v.*). By him the founding of theology on reason was rejected, and he suffered persecution for his faith (see W. N. Patton, *Aḥmed ibn Hanbal and the Miḥna*, Leiden, 1897). Mu'tazilism retained its sway until 849, when the caliph Motawakkil again declared the Koran uncreate and restored orthodoxy. It was during the early years of the Abbasid rule that the four legal schools of Abū Hanīfa (d. 767), Mālik ibn Anas (d. 795), ash-Shāfi'ī (d. 819) and Ibn Hanbal (d. 855) came into existence (see Mahommedan Law). As the bases of religion and law were the same, so the methods applied in the treatment of the one affected the other. Abū Hanīfa depended little on tradition, but referred back to the Koran, making use of individual opinion (*ra'y*) as controlled by analogy (*qīyās*) with a written ordinance. Mālik Ibn Anas supplemented the Koran and Sunna by customary law founded largely on the custom (*ijmā'*) of Medina, and by what he conceived to be for the public good (*istiṣlāḥ*). Shafi'ī recognized tradition as equal to the Koran, and even as being able to supersede its ordinances, while he also recognized the universal custom (*ijmā'*) of the Moslem world as divine and binding. His four bases of religion—Koran, sunna, qiyās and ijmā'—have been generally accepted in Islam (see above). Ibn Hanbal's position has been already mentioned. All these four schools are reckoned orthodox, and all orthodox Moslems belong to one or another of them. Another teacher of this time, who founded a school which did not succeed in being recognized as orthodox, was Dā'ūd uz-Ẓāhirī. Trained as a Shafi'ite, he became too strict for this school, rejected analogy, restricted *ijmā'* to the agreement or custom of the companions of Mahomet, and accepted the whole of the Koran and tradition in the most literal and external sense. His followers were called Ẓāhirites (*i.e.* externalists). After Ash'arī's time these principles were applied to theology by Ibn Hazm (*q.v.*) see I. Goldziher, *Die Zahiriten, ihr Lehrsystem und ihre Geschichte* (Leipzig, 1884).

Before turning to the reform of Ash'arī and the introduction into orthodox theology of scholastic philosophy it is necessary to notice another phase of religious life which became the common property of orthodox and heretics. This was the introduction of asceticism in religions practice and of mysticism in religious thought. Sufi'ism (*q.v.*), which combined these two, is rightly not counted among the sects of Islam. Asceticism seems to have won a certain amount of approval from Mahomet himself, who much respected the Christian monks. The attention paid in early Islam to the joys and punishments of the future life led to self-denial and simple living in this world. An Arabian writer, speaking of the simplicity of manners of the first four caliphs, says that their affairs were conducted with more consideration of the future life than of this world. Many Moslems went

even farther than these caliphs, and gave up all concern as far as possible with the affairs of this world and lived in poverty, in wanderings or in retirement (see Dervish). For the historical development of this movement, with its accompanying mysticism, see Sufi'ism. Ash'arī (d. before 942) was for forty years a Mu'tazilite, then became orthodox (see Ash'arī), and at once applied rational methods for the support and interpretation of the orthodox faith. Before him, reason had not been allowed any scope in orthodox theology. He was not the first to use it; some teachers (as al-Junaid) had employed it in teaching, but only in secret and for the few. The methods of scholastic philosophy were now introduced into Moslem theology. The chief characteristic of his religious teaching was the adoption of the *via media* between materialistic grossness and the ideas of pure speculative philosophy. Thus he taught, as to the attributes of God, that they exist, but are not to be compared with human attributes; as to His visibility, that He can be seen but without the limitations of human sight. As to the great question of free will, he denied man's power but asserted his responsibility. So he passed in review the doctrines of God, faith, the Koran, sin, intercession, &c., and for the first time in the history of Islam produced a systematic theology. The teaching of Ash'arī was taken up and propagated by the Buyids soon after his death, and was developed and perfected by Abū Bekr ul-Bāqilānī, the Cadi (d. 1012), but up to the middle of the 5th century of Islam (*c.* A.D. 1058) was suspected elsewhere and confounded with Mu'tazilism. The Ash'arīte al-Juwainī (known as Imām ul-Haramain) was persecuted under Toghrul Beg (*c.* 1053) and exiled, but was restored under Alp Arslan by the vizier Niẓām ul-Mulk, who founded an Ash'arite college (the Niẓāmiyya). In the West, Ibn Hazm (*q.v.*) fiercely opposed the system, but Ghazālī established its orthodoxy in the East, and it spread from Persia to Syria and Egypt under the Ayyūbites and Mamelukes and thence to the Almohades in Africa under Ibn Tumart (1130). It remains the predominating influence to the present day, its only serious rival being the theological system of al-Matāridī, a Hanifite (d. 945), whose creed as represented in that of an-Nasafī is still used largely by the Turks. Since the 12th century no great theological movement has been made in Islam. The quiet of religious life has twice been broken, once by Wahhābism (*q.v.*) in Arabia, once by Bābism (*q.v.*) in Persia.

The Sects

According to an early tradition Mahomet said that Islam would be divided into seventy-three parties (sects),[4] of which seventy-two would perish and one would be saved. The orthodox Arabian writers on heretical sects of Islam feel compelled by this tradition to make up their number to seventy-two, and, as different writers adopt different divisions or are familiar with different parties, the names of sects amount to some hundreds. Each writer, however, adopts certain main classes under which he attempts to group the others. Abū Muṭī' Makhūl at the beginning of the 10th century in his "Refutation" (MS. in Bodleian Library) has six such chief classes: Ḥarūrites (*i.e.* Khārijites), Rāfiḍites (*i.e.* Shi'ites), Qadarites, Jabarites, Jahmites and Murjiites. Ibn Hazm (*q.v.*) adopts four classes: Mu'tazilites (Motazilites), Murjiites, Shi'ites and Khārijites. Shahrastānī (*q.v.*) complains of the want of system in earlier writers, and suggests as bases of classification the position of parties with regard to the doctrines as to (1) the divine attributes, (2) predestination and free-will (3) promises and threats, faith and error, (4) revelation, reason, the imāmate. In one part of his preface he gives as the chief parties the Qadarites, Ṣifātites, Khārijites and Shi'ites, proposing to divide these classes according to leaders who agreed with the main doctrines of their class but differed in some points. In another place he mentions four opposite pairs of sects: (1) the Qadarites with their doctrine of free-will, and the Jabarites, who are necessitarians; (2) the Ṣifātites, who maintain the eternal nature of the attributes of God, and the Mu'tazilites, who deny it; (3) the Murjiites, who postpone judgment of actions until the Last Day, and the Wā'idites, who condemn in this life; (4) the Khārijites, who consider the caliphate a human institution, and the Shi'ites, who deify their ruler. In his detailed treatment of the sects Shahrastānī arranged them under the headings: Mu'tazilites, Jabarites, Ṣifātites, Khārijites, Murjiites and Shi'ites. About the same time as Shahrastānī two other Arabian writers wrote on the sects—Ṭāhir ul-Isfarainī (d. 1078), whose MS. is in the Berlin library, and 'Abd ul-Qādir ul-Jīlānī (1078-1166) in his *Kitāb ul-Ghanīyya li-Tālibī Tarīq il-Haqqi* (Cairo, 1871). Both adopt as main classes Rāfiḍites (or Shi'ites), Qadarites (or Mu'tazilites), Khārijites, Murjiites, Najjārites, Dirārites, Jahmites, Mushabbiha, to which Ṭāhir adds Bakrites, Karrāmites, and a class including those sects which are not reckoned as Moslem though they have sprung from Islam. Jīlānī adds to the eight the Kilābites.

The following list is not a complete list of names of sects but is founded on that of Shahrastānī.[5]

Afṭaḥites.—Shi'ites of the Imāmite class, who ascribe the imāmate to 'Abdallah ul-Afṭaḥi, the son of Ṣādiq.

Ajārida.—Khārijites, followers of Ibn 'Ajarrad, who agreed for the most part with the Najadāt (below), considered grave sins as equivalent to unbelief, but remained friendly with those who professed Islam but did not fight for it. They rejected *sura* 7 as a fable. Shahrastānī enumerates seven divisions of this sect.

Akhnasites.—A section of the Tha'āliba not so strict in treatment of those who fear to fight for Islam.

Ash'arites.—Followers of Ash'arī (*q.v.*) who are counted by Shahrastānī among the Ṣifātites.

Aṭrāfites.—A division of the 'Ajārida who agree with the Ḥamzites except that they excuse the lower classes for inaction when they are ignorant of the law.

Azraqites.—Khārijites who followed al-Azraq in the days of Ibn Zubair. They held 'Ali to be an unbeliever; those who did not fight were unbelievers; the children of unbelievers were to be put to death and went to hell. Sin is unbelief.

Bahshamites.—Mu'tazilites akin to the Jubbā'ites.

Baihasites.—Khārijites, followers of Abu Baihas ul-Haitham, who was put to death by the caliph Walīd. They asserted the necessity of knowledge for religion.

Bāqirites.—Shi'ites who followed Abū Ja'far ul-Bāqir, the fifth imām, and looked for his return.

Bāṭinites.—Isma'ilites, so called because they believe that every external has an internal (*bātin*), and every passage in the Koran has an allegoric meaning.

Bishrites.—Mu'tazilites, followers of Bishr ibn Mu'tamir, one of the most learned men of his party. His teaching was philosophical and was distinguished by his doctrine of "origination" (*tawallud*).

Bunānites.—Kaisānites, followers of Bunān ibn Sim'ān un-Nahdī, who claimed that the imāmate passed from Abū Hāshim to himself and that he had also acquired the divine element of 'Alī.

Butrites.—Zaidites, followers of Kathīr un-Nawā ul-Abtar, who agreed with the Suleimanites (Sulaimānites) except that he suspended judgment as to whether Othmān was a believer or not.

Ḍirārites.—Jabarites who empty God of his attributes, and assert that man has a sixth sense by which he will see God on the day of resurrection. The actions of man are "created" and acquired by him. A caliph need not be chosen from the Koreish.

Ghāliites (Ghulā) are the extreme Shi'ites (*q.v.*) in ascribing deity to the imāms. Their heresies are said to be four in number: (1) Making God resemble man, (2) ascribing change of mind to God, (3) looking for the return of the imām, (4) metempsychosis. They are divided by Shahrastānī into ten classes.

Ghassānites.—Murjiites, followers of Ghassān ibn ul-Kufī, who say that faith consists of knowledge of God, his apostle, and the Koran in general not in detail, and that faith increases but is not diminished.

Ḥabities = Ḥāyitites (below).

Ḥadathites (Ḥudabites) are Mu'tazilites, followers of Faḍl ibn ul-Ḥadathī, who agreed with the Ḥāyitites (below).

Ḥafṣites.—Ibāḍites, followers of Ḥafṣ ibn abī-l-Miqdām, who distinguished between idolatry (*shirk*) and unbelief (*kufr*).

Ḥamzites.—'Ajārida, followers of Hamza ibn Adrak in Sijistān. They agree with the Maimūnites, but condemn the children of unbelievers to hell.

Ḥārithites.—Ibāḍites who differ from others in holding the Mu'tazilite doctrine of free-will.

Ḥarūrites.—A name given to the first Khārijites, who rebelled against 'Āli, and met in Ḥarūra near Kufa.

Hāshimites.—Shi'ites who supported Abū Hāshim, son of Mahommed ibn ul-Ḥanafiyya, although they held that his father had gone astray.

Hāshwiites.—A party who asserted the eternity even of the letters of the Koran. They are not mentioned as a separate sect by Shahrastānī; cf. van Vloten, "*Les Hachwia et Nabita*," in the *Acts of the 11th Oriental Congress* (Paris, 1899), pt. iii., pp. 99 sqq.

Ḥāyiṭites.—Mu'tazilites who agreed with the Naẓẓāmites, but added three heresies of their own: (1) the divinity of the Messiah, (2) metempsychosis, (3) the interpretation of all references to the vision of God as referring to the "first Reason" or "creative Reason."

Hishāmites.—A name given to two sects: (1) Mu'tazilites, strong in their assertion of man's free-will, even opposing the statement of the Koran. (2) Shi'ites of the extreme kind, who attributed to God a body with quantities (measurements) and qualities.

Ḥudabites.—See Ḥadathites.

Hudhailites (Hodhailites).—Mu'tazilites, followers of Abū-l Hudhail Ḥamdān, who was a leading teacher of his party and developed the philosophical side of its teaching. Ten of his main doctrines are given by Shahrastānī.

Ibaḍites.—Khārijites of moderate tendencies (see above).

Ilbāites.—Ghāliites who put 'Alī above Mahomet and blamed the latter because he called men to himself instead of to 'Alī.

Imāmites.—One of the chief divisions of the Shi'ites (*q.v.*).

Isḥāqites.—Ghāliites agreeing with the Nuṣairites except that they incline to speak of the imams' participation in the prophetic office rather than of their divinity.

Isma'īlites.—This name is applied to all who consider Isma'īl ibn Ja'far the last imām, some believing that he did not die but will return, others, that at his death his son Mahommed became imām (see Assassins); it is also used as equivalent to the Bāṭinites.

Ithna'asharites.—Imāmites who accept the twelve imāms (see Shi'ites).

Jabarites.—Those who deny all actions and power to act to man and ascribe all to God (see above).

Ja'farites.—Imāmites who carry the imāmate no farther than Ja'far uṣ-Ṣadīq.

Jāhizites.—Mu'tazilites, followers of the celebrated writer Jāhiẓ (*q.v.*), who indulged in philosophical speculations, believed in the eternity of matter, and was regarded as a naturalist (*ṭaba'ī*) rather than a theist (*allahī*).

Jahmites.—Jabarites, followers of Jahm ibn Ṣafwān, who was put to death at Merv toward the close of the Omayyad period. He was extreme in his denial of the attributes of God.

Jārūdites.—Zaidites who held that Mahomet designated 'Alī as imām, not by name but by his attributes, and that the Moslem sinned by not taking sufficient trouble to recognize these attributes.

Jubbā'ites.—Mu'tazilites who followed the philosophical teaching of Abu 'Alī Mahommed ul-Jubbā'i of Basra.

Kaisānites.—A main class of the Shi'ites (*q.v.*).

Kāmilites.—Ghāliites, followers of Abū Kāmil, who condemned the companions (*Anṣār*) because they did not do allegiance to 'Alī, and 'Alī because he surrendered his claims.

Karrāmites.—Ṣifātites, followers of Ibn Karrām, who went so far as to ascribe a body to God, and assimilated his nature to human nature.

Kayyālites.—Ghāliites, followers of Ahmad ibn Kayyāl, who, after supporting a propaganda for an Aliite, claimed to be the imām himself on the ground of his power over the spheres.

Khalafites.—‘Ajārida of Kermān and Multān, who believed that God wills good and evil, but condemned the children of unbelievers to hell.

Khārijites.—One of the earliest sects of Islam (see above).

Khārimites.—‘Ajārida, agreeing mostly with the Shu‘aibites and teaching that the relation of God to a man depends on what he professes at the end of his life.

Khaṭṭābites.—Ghāliites, followers of Abū-l Khaṭṭāb, who was put to death by Ibn Mūsā at Kufa. He was a violent supporter of Ja‘far uṣ-Ṣādiq, who however disowned him.

Khayyātites.—Mu‘tazilites, followers of Abū-l Ḥosain ul-Khayyāt, a teacher in Bagdad, part of whose philosophical teaching was that the non-existent is a thing.

Ma‘badites.—Tha‘labites who differed from the Akhnasites on the question of the marriage of believing women and from Tha‘lab on the question of taking alms from slaves.

Maimūnites.—‘Ajārida, followers of Maimūn ibn Khālid, who believed that God wills good only and that man determines his actions.

Majhūlites.—Tha‘labites, agreeing generally with the Khārimites, but teaching that he who knows some names and attributes of God and is ignorant of some knows God.

Ma‘lūmites.—Tha‘labites agreeing generally with the Khārimites but alleging that a believer must know all the names and attributes of God.

Manṣūrites.—Ghāliites, followers of Abū Manṣūr ul-‘Ijlī, who at first supported al-Bāqir, but, rejected by him, claimed the imāmate for himself. He was crucified by the caliph Hishām ibn ‘Abd ul-Mālik (Abdalmalik).

Mu‘ammarites.[6]—Mu‘tazilites who strongly denied the predestination of God, and affirmed that God created bodies only, and that the accidents spring naturally from them.

Mufaḍḍalites.[6]—The same as the Mūsāites (*q.v.*).

Mughīrites.[6]—Ghāliites, followers of Mughīra ibn Sa‘īd ul-‘Ijlī, who claimed the imāmate and prophetic office and held extremely gross views of God.

Muhakkima[6] (the first).—Another name for the Ḥarūrites (above).

Mukarramites.[6]—Tha‘labites who taught that sin consists in ignorance of God.

Mukhtārites.[6]—Kaisānites, followers of al-Mukhtār ibn ‘Ubaid, who held to Mahommed ibn ul-Ḥanafīyya but was disowned by him. He allowed the possibility of change of mind on the part of God.

Murjiites.—Those who postponed judgment of actions until the Day of Judgment. See above.

Mūṣāites.—Imāmites who held to the imāmate of Mūsā ibn Ja‘far, who was imprisoned by Harun al-Rashid and poisoned.

Mushabbiha.[6]—Ṣifātites who compared God’s actions with human actions. They said that the Koran was eternal with all its letters, accents and written signs.

Mu‘tazilites.[6]—The rationalists of Islam. See above, cf. also H. Steiner, *Die Mu‘taziliten oder die Freidenker im Islām* (Leipzig, 1865).

Muzdārites.[6]—Mu‘tazilites, followers of al-Muzdār, a pupil of Bishr (cf. Bishrites) whose teaching he developed further. He taught that God has power to do evil, but, if he acted thus, would be an evil God; also that man can produce the equal of the Koran.

Najadat (also known as *‘Adhirites*).—Kharijites, who followed Najda ibn ‘Āmir of Yemāma as he went to join the Azraqites but withdrew from these, being more orthodox than they. He held that fear of fighting was not sin.

Nāwisites take their name from a person or a place. They are Ja‘farites who believe in Ṣādiq as the mahdi.

Nazzāmites.—Mu‘tazilites, followers of Ibrahīm ibn Sayyār un-Nazzām, who was an extremist in his teaching of man’s free-will and other philosophical doctrines.

Nu‘mānites.[6]—Ghāliites agreeing in some points with Hishāmites, but holding that God is a light in the form of a man, yet not a body.

Nuṣairites.[6]—Ghāliites who agree with the Isḥāqites except that they lay more stress on the incorporation of the deity.

Qadarites.—The upholders of free-will (see above).

Qata‘ites.—Mūsāites who regard the rank of the imāms as closed with the death of Mūsā.

Rāfiḍites.—A term used by some writers to denote the Shi‘ites as a whole; by others given to a class of the Shi‘ites who forsook Zaid ibn ‘Alī because he forbade them to abuse the Companions.

Rashīdites.—Tha‘labites, followers of Rashīd ut-Tūsi, sometimes called ‘Ushrites (“tithers”) because they differed from others on the question of tithing the produce of land watered by rivers and canals.

Rizāmites.—Kaisānites of Khorasān at the time of Abū Muslim, to whom they ascribed the imāmate and the Spirit of God. They also believed in metempsychosis.

Saba‘ites.—Ghāliites, who followed ‘Abdallah ibn Sabā (see Shi‘ites).

Ṣāliḥites.—(*a*) Zaidites, followers of al-Hasan ibn Ṣāliḥ, who agreed with the teachings of the Butrites (above); (*b*) Murjiites, followers of Ṣāliḥ ibn Amr, who united with the doctrines of their own party those of the Qadarites.

Ṣaltites.—‘Ajārida who had nothing to do with the children of believers until they had grown up and professed Islam.

Shaibānites.—Tha'labites, followers of Shaibān ibn Salama, who was killed in the time of Abū Muslim (Moslem). They arose chiefly in Jorjān and Armenia and agreed in doctrine with the Jahmites.

Shamīṭites.—Ja'farites, followers of Yaḥyā ibn Abū Shamīṭ.

Shi'ites.—See separate article.

Shu'aibites.—'Ajārida who said that God creates the actions of men, and men appropriate them.

Ṣifātites are those who ascribe eternity to all the attributes of God, whether they denote essence or action, or are of the class called descriptive attributes.

Ṣifrites, the same as Ziyādites (below).

Sulaimānites (Suleimanites).—Zaidites, followers of Suleimān ibn Jarīr, who held that the appointment to the imāmate was a matter of consultation and that the imāmates of Abū Bekr and Omar were legal although 'Alī had a better claim.

Tha'labites.—A party of the Khārijites, followers of Tha'lab ibn Amir, who agreed with the 'Ajārida except that he was friendly with children until they actually denied the faith. He also took alms from slaves when they were rich, and gave alms to poor slaves.

Thaubānites.—Murjiites who said that faith consists in the knowledge and confession of God and His apostle, and what the intellect is not capable of doing. What the intellect can do (or leave) is not of faith.

Thumāmites.—Mu'tazilites, followers of Thumāma ibn Ashras in the days of Mamūn, who taught that all non-Moslems would become dust on the day of resurrection.

Tūmanites.—Murjiites who taught that faith depends on obedience rather to the principles than to the commands of Islam.

'Ubaidites.—Murjiites who believed that anything but idolatry might be forgiven, and that if a man died professing the unity of God his sins would not hurt him.

Wa'īdites.—Those who, opposed to the Murjiites, pronounced judgment in this life; they are not counted as a separate sect by Shahrastānī (see above).

Wāṣilites.—A name given to those who followed Wāṣil ibn 'Atā, the founder of Mu'tazilitism, who denied the attributes of God, asserted the power of man over his own actions, taught the existence of a middle place between heaven and hell, and despised the parties of Othman and 'Alī alike.

Yazīdites.—Ibāḍites who said that they followed the religion of the Sabians in the Koran, and believed that God would send an apostle from the Persians.

Yūnusites.—Murjiites who taught that faith consists in knowledge of God, subjection to Him, abandonment of pride before Him, and love in the heart. Obedience apart from knowledge is not of faith.

Zaidites.—The moderate Shi'ites (see SHI'ITES).

Ziyādites.—Khārijites, followers of Ziyād ibn ul-Aṣfar, who did not regard those who abstained from fighting for Islam as unbelievers, and did not kill the children of idolaters or condemn them to hell.

AUTHORITIES.—For the philosophy and theology of Ash'arī see M. A. F. Mehren, *Exposé de la réforme de l'Islamisme par Abou-'l Hasan Ali el-Ash'arī* (Leiden, 1878); W. Spitta, *Zur Geschichte Abu-l Hasan al-Ash'arīs* (Leipzig, 1876); M. Schreiner, *Zur Geschichte des Ash'aritenthums* (Leiden, 1891); D. B. Macdonald, *Development of Muslim Theology, Jurisprudence and Constitutional Theory* (London, 1903). The last work contains translations of the creeds of Ash'arī and Nasafī (Matāridite). A further bibliography of works on the faith and outlook of Islam will be found in D. B. Macdonald's *Muslim Theology*.

The text of the Koran has been edited by G. Flügel, Leipzig, various dates; and by G. M. Redslob, Paris, 1868 and 1880. There are also hundreds of Eastern editions. Concordances have been published by G. Flügel, Leipzig, 1842 (several times reprinted), also in Egypt, Palestine and India. A dictionary and glossary were published by J. Penrice, London, 1873. English translations have been made by G. Sale, London, 1734 (the fullest edition is that with notes by E. M. Wherry, 4 vols., London, 1882-1886); by J. M. Rodwell with notes, London, 1861 and 1876; and by E. H. Palmer in vols, vi. and ix. of the "Sacred Books of the East," Oxford, 1880-1882. Among the best or best-known Arabic commentaries are those of Ṭabarī (*q.v.*), Zamakhsharī (*q.v.*), Baidhawī (*q.v.*), the Jalalain (see SUYUTI), and such later ones as the Mafātiḥ ul-Ghaib of ar-Rāzī (d. 1210). The composition and theology of the Koran are treated in the works of Nöldeke and Grimme referred to above.

On the eschatology of Islam see M. Wolff, *Muhammedanische Eschatologie* (Leipzig, 1872); and on the doctrine of revelation. Otto Pautz, *Muhammeds Lehre von der Offenbarung* (Leipzig, 1898).

(G. W. T.)

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1 See also KORAN.

2 Underlined = with interpolations.

3 For the doctrines of these two sects see Shahrastānī's *Book of Sects*, and for the Qadarites, A. de Vlieger's *Kitāb ul-Qadr, matériaux pour servir à l'étude de la doctrine de la prédestination dans la théologie musulmane* (Leiden, 1903).

4 For the origin and significance of this number see M. Steinschneider, "Die kanonische Zahl der muhammedanischen Secten und die Symbolik der Zahl, 70-73," *in Zeitschr. d. deutschen morgenl. Gesellschaft*, iv., 145-170 (1850); and I. Goldziher, "Le Denombrement des sectes mohamétanes" in *Revue de l'hist. des religions*, xxvi. 129-137 (1892).

5 The names are given throughout in the anglicized form on the analogy of Shi'ites, which is recognized in common usage. The strict termination according to the scheme of transliteration adopted in this work is *iyya*, or *iya*, *e.g.* Hishāmiyya for Hishāmites. For information regarding the important sects see separate articles and the preceding portion of this article.

6 All these names are alternatively spelt Mo- instead of Mu-.

MAHONY, FRANCIS SYLVESTER (1804-1866), known as “Father Prout,” Irish priest and author, son of a woollen manufacturer, was born in Cork in 1804. His classical education was chiefly obtained at a Jesuit college at Amiens, and after studying in Paris he entered the Jesuit college at Rome and was admitted into the Society of Jesus. He served in Switzerland and at Clongoweswood, Ireland, where he was prefect of studies and subsequently master of rhetoric. Here he was involved in scandals that led to his resignation. On going to Italy he was told at Florence that he was expelled from the Society. He succeeded, however, in obtaining priest’s orders at Rome in 1832, and returned to Ireland, but subsequently went to London, officiating for some time in the chapel of the Bavarian Legation. While there he fell in with William Maginn, and about 1834 began to contribute his celebrated “Prout Papers” to *Fraser’s Magazine*. These consist of episodes in the life of the parish priest “Father Prout,” and dialogues after the model of “Christopher North,” varied by translations of well-known English songs into Latin, Greek, French and Italian verse, which he humorously represents as being the true originals from which the English authors had merely plagiarized them. Mahony’s translations have been universally admired for the extraordinary command which they display of the various languages into which his renderings are made, and for their spirit and freedom both of thought and expression. His original verse tends chiefly to show that with all his sarcastic and cynical wit his genius had also its tender, serious and sentimental side. His “Bells of Shandon” has always been greatly admired. In 1846 Mahony became correspondent at Rome to the *Daily News*, and his letters from that capital gave very vivid pictures of the first years of the reign of Pius IX. The last twelve or fifteen years of his life were spent in Paris, whence he supplied the *Globe* with a series of piquant letters on the incidents of the day. He died in Paris on the 18th of May 1866.

The *Reliques of Father Prout* were collected from *Fraser’s Magazine* and published in two volumes in 1836; *The Final Reliques of Father Prout*, chiefly extracted from the *Daily News* and the *Globe*, were edited by Blanchard Jerrold in 1876, and an edition of his works, edited by Charles Kent, was published in 1881.

MAHOUT (Hind. *mahāwat*), an elephant-driver. The mahout sits on the elephant’s neck and directs him by voice and by the use of a goad called *ankus*.

MAHRATTAS, a people of India, inhabiting the district known by the ancient name of Maharashtra (Sans. “great kingdom or region”). This large tract, extending from the Arabian Sea on the west to the Sātpura mountains in the north, comprises a good part of western and central India, including the modern provinces of the Konkan, Khandesh, Berar, the British Deccan, part of Nagpur, and about half the nizam’s Deccan.

The etymology of the word Mahratta (*Marāthā*) is uncertain. The name does not indicate a social caste, or a religious sect; it is not even tribal. Strictly, it is confined to the upper class from whom Sivaji’s generals were mostly drawn, and who sometimes claim a Rajput origin. In a wider sense it may be extended to include all who inhabit Maharashtra and speak Mahratti as their mother-tongue. In 1901 the total number of speakers of Mahratti in all India exceeded 18 millions.

The Mahrattas have always been a separate nation or people, and still regard themselves as such, though nowadays they are almost all under British or Mahommedan jurisdiction; that is, they belong either to British India or to the nizam’s dominions. There are indeed still three large native states nominally Mahratta: that of Sindhia near the borders of Hindustan in the north, that of Holkar in Malwa in the heart of the Indian continent, and that of the gaekwar in Gujarat on the western coast. But in these states the prince, his relatives and some of his ministers or officials only are Mahrattas; the mass of the people belong to other sections of the Hindu race. These states then are not to be included in the Mahratta nation, though they have a share in Mahratta history.

In general terms the Mahrattas, in the wider sense, may be described under two main heads: first the Brahmans, and secondly the low-caste men. The Mahratta Brahmans possess, in an intense degree, the qualities of that famous caste, physical, intellectual and moral. They have generally the lofty brow, the regular features, the spare upright figure, and the calm aspect which might be expected in a race maintained in great purity yet upon a broad basis. In modern times they have proved themselves the most able and ambitious of all the Brahmans in the Indian Empire. They are notably divided into two sections: the Konkanast, coming from the Konkan or littoral tract on the west coast below the Western Ghāt mountains; and the Deshast, coming from the uplands or Deccan, on the east of the mountains. Though there have been many distinguished Deshasts, yet the most remarkable of all have been Konkanasts. For instance, the pēshwas, or heads of the Mahratta confederation which at one time dominated nearly all India, were Konkanast Brahmans. The

birthplaces of these persons are still known, and to this day there are sequestered villages, nestling near the western base of the Ghāts, which are pointed to as being the ancestral homes of men who two centuries ago had political control over half India.

Apart from the Brahmans, the Mahrattas may be generally designated as Sūdras, the humblest of the four great castes into which the Hindu race is theoretically divided. But the upper classes claim to be Kshattriyas or Rajputs. They probably are aborigines fundamentally, with a mixture of what are now called the Scythian tribes, which at a very early time overran India. The ordinary Mahrattas, who form the backbone of the nation, have plain features, an uncouth manner, short stature, a small but wiry frame. Though not powerful physically as compared with the northern races of the Punjab and Oudh, they have much activity and an unsurpassed endurance. Born and bred in or near the Western Ghāt mountains and the numerous tributary ranges, they have all the qualities of mountaineers. In recent times they enter military service less and less, betaking themselves mainly to cultivation and to the carrying business connected with agriculture. As husbandmen they are not remarkable; but as graziers, as cartmen, as labourers, they are excellent. As artisans they have seldom signalized themselves, save as armourers and clothweavers.

In the Konkan there are some superior proprietors termed Khots. With this and perhaps some other exceptions, there are not in the Mahratta country many large landlords, nor many of the superior tenure-holders whose position relatively to that of the peasantry has caused much discussion in other parts of India. There are indeed many Mahratta chiefs still resident in the country, members of the aristocracy which formerly enjoyed much wealth and power. They are sometimes in the position of landlords, but often they are the assignees of the land revenue, which they are entitled under special grants to collect for themselves instead of for government, paying merely a small sum to Government by way of quit-rent. Under them the cultivators are by British arrangements placed in the position of peasant proprietors. The village community has always existed as the social unit in the Mahratta territories, though with less cohesion among its members than in the village communities of Hindustan and the Punjab. The ancient offices pertaining to the village, as those of the headmen (*patel*), the village accountant, &c., are in working order throughout the Mahratta country.

The Mahratta peasantry possess manly fortitude under suffering and misfortune. Though patient and good-tempered in the main, they have a latent warmth of temper, and if oppressed beyond a certain limit they would fiercely turn upon their tormentors. As a rule they are orderly and law-abiding, but traditions of plunder have been handed down to them from early times, and many of them retain the predatory instincts of their forefathers. The neighbourhood of dense forests, steep hill-sides, and fastnesses hard of access offers extraordinary facilities to plunderers for screening themselves and their booty. Thus gang robbery is apt to break out, gains head with rapidity, and is suppressed with difficulty. In times of peace it is kept under, but during war, or whenever the bands of civil order are loosened, it becomes a cause of anxiety and a source of danger. The women have frankness and strength of character; they work hard in the fields, and as a rule evince domestic virtue.

The peasantry preserve a grave and quiet demeanour, but they have their humble ideas of gaiety, and hold their gatherings on occasions of births or marriages. They frequently beguile their toil with carols. They like the gossiping and bartering at the rural markets and in the larger fairs, which are sometimes held in strikingly picturesque localities. They are superstitious, and worship with hearty veneration any being or thing whose destructive agency they fear. They even speak of the tiger with honorific titles. They are Hindus, but their Hinduism is held to be of a non-Aryan type. They are sincerely devout in religion, and feel an awe regarding “the holy Brahmans,” holding the life and the person of a Brahman sacred, even though he be a criminal of the deepest dye. They of course regard the cow as equally sacred. There are two principal sects among modern Hindus—those who follow Vishnu, and those who follow Siva. The Mahrattas generally follow Siva and his wife, a dread goddess known under many names. The Mahratta war-cry, “Har, Har, Mahadeo,” referred to Siva. All classes high and low are fond of the religious festivals, the principal of which, the Dasahra, occurs in October, when the first harvest of the year has been secured and the second crops sown. This has always been held with the utmost pomp and magnificence at every centre of Mahratta wealth and power. The people frequently assemble in bowers and arbours constructed of leafy boughs to hear kathas recited. These recitations are partly religious, partly also romantic and quasi-historical. After them national resolves of just resistance or of aggressive ambition have often been formed.

Apart from the Mahratta Brahmans, as already mentioned, the Mahratta nobles and princes are not generally fine-looking men. There is general truth in what was once said by a high authority to the effect that, while there will be something dignified in the humblest Rājpūt, there will be something mean in the highest Mahratta. Bluff good-nature, a certain jocoseness, a humour pungent and ready, though somewhat coarse, a hot or even violent disposition, are characteristics of Mahratta chieftains. They usually show little aptitude for business or for sedentary pursuits; but, on the other hand, they are born equestrians and sportsmen. Mahratta ladies and princesses have often taken a prominent part, for good or evil, in public affairs and dynastic intrigues.

Though they have produced some poetry, the Mahrattas have never done much for literature. Nor have they been distinguished in industrial art. Their architecture in wood, however, was excellent; and the teak forests of their country afforded the finest timber for building and for carving. They had also much skill in the construction of works for the supply of drinking water on a large scale and for irrigation.

The range of the Western Ghāts enabled the Mahrattas to rise against their Mahommedan conquerors, to reassert their Hindu nationality against the whole power of the Mogul Empire, and to establish in its place an empire of their own. It is often stated that in India British conquest or annexation succeeded Mahommedan rule; and to a considerable extent this was the case. But, on the other hand, the principal power, the widest sovereignty, which the British overthrew in India was that of the Mahrattas.

During the earlier Moslem invasions in 1100 and in subsequent years, the Mahrattas do not seem to have made much resistance. They submitted to several Mahommedan kings under the changing circumstances of those times. It was against the Mahommedan king of Bijapur in the Deccan that Sivaji, the hero of Mahratta history, first rebelled in 1657. Sivaji and his fighting officers were Mahrattas of humble caste, but his ministers were Brahmans. When the Mogul Empire absorbed the Bijapur kingdom he defied the emperor. He imparted a self-reliant enthusiasm to his countrymen, formed them into an army, and organized them as a political community; his mountaineer infantry, though limited in numbers, proved desperately courageous; his

cavalry was daring and ubiquitous. The Moslems, having once overcome the Hindus in almost all parts of India, had not for centuries met with any noteworthy uprising. Sivaji, however, planned their expulsion, and before the end of his restless life made much progress in the execution of that design. The new state which he founded was maintained under various vicissitudes after his death. Mahratta resistance, once aroused by him, was never extinguished, and the imperial resources were worn out by ceaseless though vain efforts to quell it. The great Mogul emperor's impoverished and enfeebled successor was fain to recognize the Mahratta state by a formal instrument. The Mahratta king, a descendant of Sivaji, had become a *roi fainéant*, and the arrangement was negotiated by his Brahman minister, whose official designation was the pēshwa. The office of pēshwa then became hereditary in the minister's family, and grew in importance as the Mahratta kingdom rose, while the king sunk into the condition of a puppet. Thus the Mahratta power was consolidated throughout nearly the whole of Maharashtra under the Brahman pēshwa as virtual sovereign, with his capital at Poona, while the titular Mahratta raja or king had his court at the neighbouring city of Satara. Despite his political importance, however, the raja was still venerated as the descendant of Sivaji.

Then several chiefs carved out principalities of their own from among the ruins of the Mogul Empire. Thus Raghoji Bhonsla established himself in the tracts lying underneath the southern base of the Satpura range (namely, Nagpur and Berar), overran Orissa and entered Bengal. Damaji Gaekwar descended from the Western Ghāts upon the alluvial plains of Gujarat around Baroda; Tukoji Holkar subdued the uplands of Malwa beyond the Vindhya range on the north bank of the Nerbudda; and Mahadji Sindhia obtained possession of large tracts immediately south of Agra and Delhi, marched into Hindustan and became virtually the master of the Mogul emperor himself (see Gwalior). Sivaji's own father had founded a dominion at Tanjore in the extreme south, which, however, never had relations with the central power at Poona. The same may be said of the state of Kolhapur, allotted to a younger branch of Sivaji's family.

But these principalities, though independent respecting internal administration, and making war or peace with their neighbours according to opportunity, owned allegiance to the pēshwa at Poona as the head of the Mahratta race. On state occasions heads of principalities would visit Poona by way of acknowledging the superior position of the pēshwa. On the other hand, the pēshwa was careful to obtain the sanction of his nominal sovereign at Satara to every important act of state. Thus a confederation was formed of which the Brahman pēshwa or head was at Poona, governing the adjacent territories, while the members, belonging to the lower castes, were scattered throughout the continent of India. Such was the Mahratta Empire which supplanted the Mogul Empire. The Mahratta power grew and prospered till it embraced all western and most of central India. Its culminating point was reached about 1750, or about a century after Sivaji first rebelled against his Mahommedan sovereign.

Its armies drew soldiers from all parts of India. The infantry was not of good quality; but its cavalry was really an enormous force, numbering fully a hundred thousand in all. The horsemen were splendidly audacious in riding for long distances into the heart of a hostile country, without support, striking some terrific blows, and then returning rapidly beyond reach of pursuit. They could truly boast of having watered their horses in every Indian river from the Cauvery to the Indus. If attacked, however, in a competent manner, they would not stand; and afterwards, in conflict with the British, whole masses of them behaved in a dastardly manner. As their ambition grew the chiefs began to organize their troops after the system learnt from the English and French. In this way several Frenchmen—Benoit de Boigne, Perron and others—rose in the Mahratta service to a position dangerous to the British. But the new system was unsuited to the Mahratta genius; it hampered the meteoric movements of the cavalry, which was obliged to manœuvre in combination with the new artillery and the disciplined battalions. Mahratta elders hence uttered predictions of military disaster which were in the end more than fulfilled.

The rapid and amazing success of the Mahratta confederation rendered it the largest Hindu power that ever existed in India. But it lacked the elements of true greatness. It was founded by plundering expeditions, and its subsequent existence was tainted by the baseness of this predatory origin. With the exception of the pēshwas, its chiefs were little more than free-booting warriors, for the most part rude, violent and unlettered. Their custom was to offer their neighbours or victims the alternative of paying *chouth*, that is, one-fourth of the revenue, or being plundered and ravaged. Thus the Mahratta *chouth* came to have an ominous significance in Indian history. Desultory efforts were made to establish a civil government, but in the main there was no administration formed on statesmanlike principles. The pēshwas, on the other hand, as Brahmans, were men of the highest education then possible in India. But they were absorbed by the direction of military and political combinations, and by intrigues for the preservation of their own power; and, even allowing for all this, they failed to evince the civil capacity which might have been anticipated. While several displayed commanding abilities, and some possessed many virtues, one alone attempted to conduct an administration in an enlightened manner, and he died prematurely.

There were at the same time powers existing in India to keep the Mahrattas in check, and some parts of India were excepted from their depredations. The English power was rising at Calcutta, Madras and Bombay. The nascent Sikh power prevented Mahratta incursions from being permanently successful in the Punjab. As the Mogul Empire broke up, some separate Mahommedan powers rose upon its ruins. The nizam of the Deccan established himself at Hyderabad, comparatively near the headquarters of the pēshwa. Hyder Ali was proclaimed sultan of Mysore in the south. Ahmed Shah Abdali burst upon India from Afghanistan. The Mahrattas bravely encountered him at Panipat near Delhi in 1761, and were decisively defeated. The defeat, however, did not essentially shake the Mahratta confederation. It was collision with the English that broke that wonderful fabric to pieces.

The first collision with the English occurred in 1775, arising from a disputed succession to the pēshwaship. The English government at Bombay supported one of the claimants, and the affair became critical for the English as well as for the Mahrattas. It was at this conjuncture that Warren Hastings displayed his political genius and rendered signal service to his country, by succouring from Bengal the defeated Bombay army and negotiating a peace (in 1782) that restored the *status quo*.

The next collision happened in 1803. The pēshwa had fallen into grave difficulties with some of the principal members of the Mahratta confederation. He therefore placed himself under British protection, and this led to

the great Mahratta War, in which the Marquis Wellesley displayed those talents for military and political combination which rendered him illustrious. It was during the campaigns which ensued that General Arthur Wellesley defeated Sindhia and the Bhonsla raja at Assaye, and General Lake won the victories of Farrukhabad, Dīg and Laswari over Sindhia and Holkar. The three confederates, Sindhia, Holkar and the Bhonsla, concluded peace with the British government, after making large sacrifices of territory in favour of the victor, and submitting to British control politically. It was during these events that the British won the province of Orissa, the old Hindustan afterwards part of the North-Western Provinces, and a part of the western coast in Gujarat.

The third collision came to pass between 1816 and 1818, through the conduct, not only of the confederates, but also of the pēshwa (Baji Bao) himself. During the previous war the pēshwa had been the protégé and ally of the British; and since the war he had fallen more completely than before under British protection—British political officers and British troops being stationed at his capital. He apparently felt encouraged by circumstances to rebel. Holkar and the Bhonsla committed hostile acts. The predatory Pindaris offered a formidable resistance to the British troops. So the pēshwa ventured to take part in the combination against the British power, which even yet the Mahrattas did not despair of overthrowing. After long-protracted menaces, he attacked the British at Kirkee, but failed utterly, and fled a ruined man. Ultimately he surrendered to Sir John Malcolm, and was sent as a state pensioner to Bithūr, near Cawnpore. The British, however, released the raja of Satara from the captivity in which he had been kept during the pēshwa's time, and reinstated him on the throne, with a limited territory. Owing to these events the British government became possessed of the Konkan and of the greater part of the Deccan.

It remains to mention briefly the fortunes of each remaining member of the once imperial confederation. The principality of Satara was held to have lapsed in 1848 by the death of the raja without lineal heirs, and was annexed by the British government. The Bhonsla raja of Nagpur died without lineal heirs in 1853, and his territory was likewise annexed. The house of Holkar remained faithful to its engagements with the British government, and its position as a feudatory of the empire was maintained. In Sindhia's territory, by reason of internal feuds, the British had to undertake measures which were successfully terminated after the battles of Maharajpur and Panniar in 1843. But on the whole the house of Sindhia remained faithful. Sindhia himself was actively loyal during the Mutiny. The gaekwar gradually fell under British control towards the close of the 18th century, and his house never engaged in hostilities with the British government. The ex-pēshwa lived to old age at Bithur, and died in 1857. His adopted son grew up to be the Nana Sahib, of infamous memory, who took a leading part in the Mutiny.

See J. Grant Duff, *History of the Mahrattas* (3 vols., 1826); T. D. Broughton, *Letters written in a Mahratta Camp* (1813); M. G. Ranade, *Rise of the Maratha Power* (Bombay, 1900).

(R. T.; J. S. Co.)

MAHSEER, or Mahaseer (*Barbus mosal*), a kind of barbel, abundant in the rivers of India, especially in pools of the upper and more rapid streams where they issue from the mountainous part of the country. It is one of the largest species of the Cyprinid family, attaining to a length of 3 to 5 ft., and sometimes exceeding a weight of 70 lb. Its body is well-proportioned, rather elongate, and somewhat like that of the European barbel, but covered with very large scales, of which there are only twenty-five or twenty-seven placed along the lateral line; the dorsal fin is armed with a long and strong spine, and the mouth provided with four slender and short barbels. The lips are sometimes produced into fleshy lobes. To the fisherman in India the mahseer affords the same kind of sport as the salmon in the British Isles, and it rivals that fish as regards size, strength and activity. Its flesh is likewise much esteemed.

MAI, ANGELO (1782-1854), Italian cardinal and philologist, was born of humble parents at Schilpario in the province of Bergamo, Lombardy, on the 7th of March 1782. In 1799 he entered the Society of Jesus, and in 1804 he became a teacher of classics in the college of Naples. After completing his studies at the Collegium Romanum, he lived for some time at Orvieto, where he was engaged in teaching and palaeographical studies. The political events of 1808 necessitated his withdrawal from Rome (to which he had meanwhile returned) to Milan, where in 1813 he was made custodian of the Ambrosian library. He now threw himself with characteristic energy and zeal into the task of examining the numerous MSS. committed to his charge, and in the course of the next six years was able to restore to the world a considerable number of long-lost works. Having withdrawn from the Society of Jesus, he was invited to Rome in 1819 as chief keeper of the Vatican library. In 1833 he was transferred to the office of secretary of the congregation of the Propaganda; on the 12th of February 1838 he was raised to the dignity of cardinal. He died at Castelgandolfo, near Albano, on the 8th of September 1854.

It is on his skill as a reader of palimpsests that Mai's fame chiefly rests. To the period of his residence at Milan belong: Fragments of Cicero's *Pro Scauro, Pro Tullio, Pro Flacco, In Clodium et Curionem, De aere alieno Milonis, De rege* (*Alexandrino* (1814); *M. Corn. Frontonis opera inedita, cum epistolis item ineditis, Antonini Pii, Marci Aurelii, Lucii Veri et Appiani* (1815; new ed., 1823, with more than 100 additional letters found in the Vatican library); portions of eight speeches of Quintus Aurelius Symmachus; fragments of

Plautus; the oration of Isaeus *De hereditate Cleonymi*; the last nine books of the *Antiquities* of Dionysius of Halicarnassus, and a number of other works. *M. Tullii Ciceronis de republica quae supersunt* appeared at Rome in 1822; *Scriptorum veterum nova collectio, e vaticanis codicibus edita* in 1825-1838; *Classici scriptores e vaticanis codicibus editi* in 1828-1838; *Spicilegium romanum* in 1839-1844; and *Patrum nova bibliotheca* in 1845-1853. His edition of the celebrated *Codex vaticanus*, completed in 1838, but not published (ostensibly on the ground of inaccuracies) till four years after his death (1858), is the least satisfactory of his labours and was superseded by the edition of Vercellone and Cozza (1868), which itself leaves much to be desired. Although Mai was not as successful in textual criticism as in the decipherment of manuscripts, he will always be remembered as a laborious and persevering pioneer, by whose efforts many ancient writings have been rescued from oblivion.

See B. Prina, *Biografia del cardinale Angelo Mai* (Bergamo, 1882), a scientific work, which gives a full and, at the same time, a just appreciation of his work; Cozza-Luzi, *Epistolario del card. Angelo Mai* (Bergamo, 1883); life by G. Poletto (Siena, 1887).

MAIA, in Greek mythology, the eldest of the Pleiades, the seven daughters of Atlas and the Oceanid Pleïone. She and her sisters, born on Mt Cyllene in Arcadia, are sometimes called mountain goddesses. In a cave of Cyllene Maia became by Zeus the mother of the god Hermes. The story is told in the *Hymn to Hermes* attributed to Homer. She was identified by the Romans with Maia Majesta, an old Italian goddess of spring, to whom a sacrifice was offered on the 1st of May by the priest of Vulcan.

MAIDA, a town of Calabria, Italy, in the province of Catanzaro, from which it is 30 m. W.S.W. direct, and 12 m. N.N.E. of Pizzo by rail (the station is 8 m. W. of the town). Pop. (1901), 5190. The town gives its name to the plain of Maida, where in 1806 British troops under Sir John Stuart defeated the French under Regnier. The names Maida Hill and Maida Vale in London are derived from this battle.

MAIDAN, an Indian term for any open plain. The Maidan is the name of the park in Calcutta, surrounding Fort William, where society people drive in the afternoon. The name is also applied to one of the valleys in the Afridi country of Tirah, and to the plateau portion of the state of Mysore.

MAIDEN, or Maid, a young unmarried girl. “Maid” is a shortened form of “maiden,” O. Eng. *maegden*, which represents a diminutive of a Teutonic word meaning “young person,” of either sex. An old English word “may,” meaning a kinsman or kinswoman, and also a virgin or girl, represents the original. In early usage “maiden” as meaning “virgin” is frequently applied to the male sex, thus, in Malory’s *Morte d’Arthur*, Sir Percyvale is called a “parfyte clene megden.” Apart from the direct applications of the word to the unmarried state, such as “maiden name,” “maiden lady,” &c., the word is used adjectivally, implying the preservation of the first state of an object, or indicating a first effort of any kind. Probably a “maiden” fortress is one which has never fallen, though the *New English Dictionary* suggests that the various “maiden castles” in England, usually ancient earthworks, may have been so called from being so strong that they could be defended by maidens, and points out that Edinburgh Castle, called “maiden-castle” by William Drummond of Hawthornden (*Speech for Edinburgh to the King*), is styled *Castrum puellarum*, the “castle of the maidens,” in Geoffrey of Monmouth. A “maiden” assize, circuit or session is one at which there are no prisoners for trial; a “maiden over” or “maiden” in cricket is an over from which no runs are scored. A “maiden speech” is the first speech made by a member of parliament in the house. In the *Annual Register* for 1794 (quoted in *N.E.D.*) the expression, with reference to Canning’s first speech, is said to be “according to the technical language of the house.” “Maiden” is applied to several objects, to a movable framework or horse for drying and airing of linen, to a washerwoman’s “dolly” or wooden beater, to the “kirnbaby” formed of the last sheaf of corn reaped which formerly figured in the Scottish harvest homes, and to the beheading instrument, known as the “Scottish maiden” (see below). “Maid,” apart from its primary sense of an unmarried woman, is chiefly used for a domestic female servant, usually with a qualifying word prefixed, such as “housemaid,” “parlour-maid,” &c.

The title of "Maid of Honour" is given to an unmarried lady attached to the personal suite of a queen. The custom of sending young girls of noble or good birth to the court of a prince or feudal superior, for the purpose, primarily, of education, goes back to early feudal times, and is parallel with the sending of boys to act as pages and squires to the feudal castles. The regular establishment of maids of honour (*filles d'honneur*) appears first in the royal court of France. This has usually been attributed to Anne of Brittany, wife of Charles VIII.; she had a group of unmarried girls of high rank at her court as part of her household, in whom she took a lively and parental interest, educating them and bestowing a dowry upon them on their marriage. A slightly earlier instance, however, has been found. When the young Margaret of Austria came to France on her espousal to Charles VIII., broken by his marriage to Anne of Brittany, there were in her train several *filles d'honneur*, whose names appear in the *Comptes d'argenterie de la reine Marguerite d'Autriche*, from 1484-1485 and 1488-1489 (*Archives de l'empire K. K. 80 and 81* quoted by A. Jal, *Dictionnaire critique de biographie et d'histoire*). It is from the days of Francis I. that the *chroniques scandaleuses* begin which circle round the maids of honour of the French court. The maids of Catherine de Medici, celebrated as the "flying squadron," *l'escadron volant*, are familiar from the pages of Pierre de l'Estoile (1574-1611) and Brantôme. Among those whose beauty Catherine used in her political intrigues, the most famous were Isabelle de Limeuil, Mlle de Montmorency-Fosseux, known as *la belle Fosseuse*, and Charlotte de Baune. The *filles d'honneur*, as an institution, were suppressed in the reign of Louis XIV., at the instigation of Mme de Montespan—who had been one of them—and their place was taken by the *dames de palais*. In the English court, this custom of attaching "maids of honour" to the queen's person was no doubt adopted from France. At the present day a queen regnant has eight maids of honour, a queen consort four. They take precedence next after the daughters of barons, and where they have not by right or courtesy a title of their own, they are styled "Honourable."

The Scottish Maiden was an instrument of capital punishment formerly in use in Scotland. It is said to have been invented by the earl of Morton, who is also said to have been its first victim. This, however, could not have been the case, as the maiden was first used at the execution of the inferior agents in the assassination of Rizzio (1561) and Morton was not beheaded till 1581. The maiden was practically an early form of guillotine. A loaded blade or axe moving in grooves was fixed in a frame about ten feet high. The axe was raised to the full height of the frame and then released, severing the victim's head from his body. At least 120, suffered death by the maiden, including the regent Morton, Sir John Gordon of Haddo, President Spottiswood, the marquis and earl of Argyll. In 1710 it ceased to be used; it is now preserved in the museum of the Society of Antiquaries of Scotland, in Edinburgh.

MAIDENHAIR, in botany, the common name for a fern, *Adiantum Capillus-Veneris*, characterized by the spreading hairlike branches of the frond, the ultimate pinnules of which are ½ to 1 in. long with a rounded crenate outer edge and repeatedly forked veins; the sori (or masses of spore-capsules) are in the crenatures of the pinnules, and are protected by a kidney-shaped involucre. The plant is widely distributed in temperate and tropical regions, and is occasionally found in the western counties of England, the Isle of Man, and west Ireland, growing on damp rocks or walls especially near the sea. The genus *Adiantum* is a large one containing many handsome species both tropical and temperate, well known in greenhouse and hothouse cultivation.

Maidenhair-tree is a popular name for *Ginkgo biloba*, a remarkable and handsome gymnospermous tree, the fan-shaped leaves of which with their forked veins recall those of the maidenhair (see Gymnosperms).

MAIDENHEAD, a market town and municipal borough in the Wokingham parliamentary division of Berkshire, England; 24½ m. W. of London by the Great Western railway. Pop. (1901), 12,980. Area, 2125 acres. It is pleasantly situated on and above the west (right) bank of the Thames, and is much in favour as a residential town and a resort of boating parties. Though of high antiquity it is wholly modern in appearance, and a large number of handsome houses have been built in its vicinity. A beautiful timbered house of the 15th century, however, survives in Ockwells, a short distance south of the town. The stone bridge carrying the London road over the Thames dates from 1772; but the crossing is of ancient importance. Maidenhead has trade in malt and grain. The borough is under a mayor, 4 aldermen and 12 councillors.

The history of Maidenhead (Maydenhutt, Maydenhith) is bound up with that of the ancient bridge. It is not mentioned in Domesday. Edward I. (1297) gave a grant of pontage in aid of the bridge, which was almost broken down; similar grants to the "bailiffs and good men of Maydenhithe" were made by succeeding sovereigns. In 1451 Henry VI. incorporated the gild of the Brethren and Sisters of Maydenhith to provide certain necessaries for the celebration of Mass and to keep the bridge in order: the gild, dissolved at the Reformation, was revived by Elizabeth, who, however, later (1581) substituted for it a corporation consisting of a warden, bridgemaster, burgesses and commonalty: the governing charter until the 19th century was that of James I. (1685) incorporating the town under the title of the mayor, bridgemaster and burgesses. In 1400 Thomas Holand, earl of Kent, held the bridge in the interests of the deposed Richard II., but was eventually forced to retire. In 1643 a meeting took place in the town between Charles I. and three of his children. In the 18th century a considerable trade was done in carrying malt, meal and timber in barges to London: at that time three fairs were held which have now practically disappeared. The Wednesday market is held under a

charter of Elizabeth (1582).

MAID MARIAN, a personage incorporated in the English legend of Robin Hood. There is no evidence that she had originally any connexion with the Robin Hood cycle. She seems to have been an essential feature of the morris dance, and in the may-game was paired sometimes with Robin-Hood, but oftener with Friar Tuck. The well-known pastoral play of Adam de la Hale, *Jeu de Robin et Marion*, and the many French songs on the subject, account for the association of the names. In the ballads on Robin Hood her name is twice casually mentioned, but there is a late ballad, by a certain S. G. (F. J. Child, *English and Scottish Ballads*, i. 219), which tells how Maid Marian sought Robin in the forest disguised as a page, and fought with him for an hour before she recognized him by his voice. S. G. was perhaps acquainted with the two plays, written in 1598, of *The Downfall and The Death of Robert Earl of Huntingdon*, by Anthony Munday and Harry Chettle. In *The Downfall* Matilda Fitz Walter escapes from the persecution of King John by following her lover to Sherwood Forest, where they took the names of Robin Hood and Maid Marian, and lived apart until they could be legally united. Perhaps this tale has some connexion with the romance of the outlaw Fulk Fitz Warin. Matilda or Mahaud, widow of Theobald Walter, escaped from John's solicitations by marrying the outlawed Fulk and following him to the forest. There were in semi-historical legends three Matildas pursued by King John, of whom particulars are given by H. L. D. Ward in his *Catalogue of Romances* (i. 502). Their several histories were fused by the Elizabethan dramatists, and associated with the Maid Marian of the morris dance, who up to that time had probably only a vague connexion with Robin Hood.

MAIDSTONE, a market town and municipal and parliamentary borough, and the county town of Kent, England, 41 m. E.S.E. of London by the South Eastern & Chatham railway. Pop. (1901), 33,516; area, 4008 acres. It lies principally on the eastern bank of the river Medway, the modern part spreading over the western slopes of a picturesque valley, which is intersected and environed by orchards and hop gardens, this being the richest agricultural district of Kent. The hop grounds form the so-called middle growth of Kent, and the town has the principal grain market in the county. Archbishop Boniface in 1260 established a hospital here (Newark hospital) for poor pilgrims, the chapel of which, with modern additions, is now St Peter's Church. The parish church of St Mary, which had existed from Norman times, was demolished in 1395 by Archbishop Courtenay, who erected on the site the present church of All Saints. This fine Perpendicular building contains, besides many excellent monuments, the richly carved sedilia and the twenty-eight oak seats used by the collegiate priests. Courtenay also founded a college of secular canons, the ruins of which are an interesting specimen of 14th-century architecture. From the reign of John until the Reformation the archbishops had a residence here, at which Stafford and Courtenay died. This Perpendicular building, with its Elizabethan east front, was acquired by the corporation as a memorial of Queen Victoria's Jubilee in 1887, and houses the school of science and art. The rectory, with the manor, passed into lay hands at the Reformation; and, having been a perpetual curacy for three hundred and twenty years, the living became a vicarage in 1866. The grammar school was founded in 1549, and endowed with the estates of the local Corpus Christi fraternity, then dissolved; the hall in which the gild assembled remains, but the school is established in modern buildings on a new site. There are oil-mills, rope, sacking and twine factories, and cement, lime, and brick works. There is a considerable carrying trade on the Medway. A museum, with public library, was opened in 1858, in an interesting building of the early part of the 16th century. This is the headquarters of the Kent Archaeological Society, founded by the Rev. L. B. Larking in 1858. In 1890 an art gallery was added. The West Kent and General hospital, the county ophthalmic hospital, county gaol and barracks may be mentioned among other institutions. From Saxon times down to 1830 condemned malefactors were executed, and all the great county meetings were held, on Penenden Heath, a common situated about a mile north-east of the town, and enclosed by the corporation as a public recreation ground. The parliamentary borough of Maidstone returns one member. The town is governed by a mayor, 6 aldermen and 18 councillors.

There is evidence of a Roman settlement at Maidstone. The name Maidstone (Medwegestun, Meddestane, Maydestan), probably meaning Medway Town, is presumably of Saxon origin. At the time of the Domesday Survey it belonged to the archbishop of Canterbury, and from the reign of John the archbishops had a residence there. Its position in the centre of Kent gave it an early importance; the shire-moot was held on Penenden Heath in the 11th century, and Maidstone was an assize town in the reign of Edward I. In 1537 Cranmer exchanged the manor of Maidstone with the king, and it was granted by Edward VI. to Sir Thomas Wyatt. Edward also incorporated the town by the title of the mayor, jurats and commonalty; it had formerly been governed by a portreve and 12 "brethren." This charter was forfeited through Wyatt's rebellion; a second charter was granted by Elizabeth in 1559 and confirmed by subsequent sovereigns. A new charter constituting a governing body of a mayor, 12 jurats and 40 common councilmen was given at the petition of the inhabitants by George II. in 1747, and remained the governing charter until 1835. Four fairs were granted by the charter of 1559; these are now held on the 13th of February, the 12th of May, the 20th of June and the 17th of October. A Thursday market was granted by Henry III. to Archbishop Boniface, and a market every second Tuesday in the month by charter of George II. A corn market on Tuesday and a cattle market on Thursday are still held. The manufacture of linen and woollen goods was introduced by Walloons, who settled here in 1567.

This was succeeded by paper-making, now the chief industry of the town. The cultivation of hops has been carried on since the 17th century.

Maidstone has been associated with various incidents of general history. Wat Tyler broke into the prison, liberated John Ball the rebel preacher, and committed various depredations. Several of the leading inhabitants joined Jack Cade's rising. The rising of the Kentish Royalists in 1648 collapsed at Maidstone, where on the 1st of June Fairfax, after five hours' obstinate fighting, captured the town at midnight.

See *Victoria County History, Kent*; I. M. Russell, *History of Maidstone* (1881).

MAIHAR, a native state of Central India, in the Baghelkhand agency. Area, 407 sq. m.; pop. (1901), 63,702; estimated revenue, £4700. The state, which is watered by the Tons river, consists mainly of alluvial soil covering sandstone, and is fertile except in the hilly district of the south. A large area is under forest, the produce of which provides a small export trade. The chief, whose title is raja, claims descent from the Kachwaha Rajput clan. The state suffered severely from famine in 1896-1897. The town of Maihar (pop. 6802) is on the East Indian railway, 97 m. N. of Jubbulpore. Extensive ruins of shrines and other buildings in its neighbourhood indicate a former much greater extent of the place.

MAIL. (1) (Through Fr. *maille*, from Lat. *macula*, a spot or hole, the mesh of a net), properly a metal ring or link which, joined closely with other links, formed the fabric of body and other armour in the middle ages, till it was superseded by plate-armour. The word "mail," properly applied to this form of chain-armour, is also used of armour generally, whether plate or chain, and is also transferred to the horny defensive coverings of animals, such as the tortoise, crab, &c. (see ARMS AND ARMOUR). (2) (O. Eng. *mál*, speech; probably the same as O. Saxon *mahal*, assembly; in meaning connected with O. Norse *mále*, stipulation), a Scots law term meaning rent, tax. "Mails and duties" are the rents, whether in kind or money, of an estate. In English the word only survives in "blackmail" (*q.v.*). (3) (Through O. Fr. *male*, mod. *malle*, a Teutonic word surviving in Dutch *maal*), properly a bag, especially one used in travelling; this word, which appears in Chaucer, is now applied chiefly to the despatch and delivery of postal matter. In this sense "mail" is properly the bag in which such matter is conveyed, and hence is applied to the contents of the mail, postal matter collectively, and to the train, carts, or other means used in the despatch and delivery of the same. In general usage "mail" is confined to the "foreign" as opposed to the "inland" despatch of letters, &c., and to which the word "post" is chiefly applied; in official language, the word refers to the inland despatch. The word appears also in "mail-coach," a coach used for conveying the mails, and in "mail-cart," a cart similarly employed. This word is also applied to a light low vehicle propelled or drawn by hand, suitable for young children. The "mail phaeton" is a type of phaeton with high seat for two persons and drawn by a pair of horses.

MAILLY, LOUISE JULIE, COMTESSE DE (1710-1751), mistress of Louis XV. of France, was the daughter of Louis, marquis de Nesle. She was the eldest of three sisters who succeeded one another as favourites of the king. In 1726 she married her cousin, Louis Alexandre de Mailly. Although Louis XV. had paid her attentions from 1732, she did not become titular mistress until 1738. She did not use her position either to enrich herself or to interfere in politics. She was supplanted by her sister, the duchess of Châteauroux, and obliged to leave court in 1742.

See E. and J. de Goncourt, *La Duchesse de Châteauroux et ses sœurs* (1879); Toussaint, *Anecdotes curieuses de ... Louis XV.* (2 vols., 1905); J. B. H. R. Capefigue, *Mesdemoiselles de Nesle et la jeunesse de Louis XV.* (1864).

MAIMANA, a town and khanate of Afghan Turkestan. The town is situated 100 m. S.W. of Balkh, and only some 25 m. from the frontier of Russian Turkestan. It is about two-thirds the size of Herat, square built and surrounded by a ruined wall and moat. The khanate was for long in dispute between Bokhara and Kabul, but in 1868 Abdur Rahman laid siege to the town, and it was compelled to come to terms. Its political status as

an Afghan province was definitely fixed by the Russo-Afghan boundary commission of 1885. The inhabitants are chiefly Uzbegs.

MAIMAND, a town in the province of Fars, Persia, a few miles east of Firuzabad and about 70 m. from Shiraz. It has a population of about 5000, almost wholly occupied with the manufacture and sale of rose-water, which is largely exported to many parts of Persia as well as to Arabia, India and Java. The district also produces great quantities of almonds. The rose gardens cover several square miles. In 1349 a great part of Maimand and of three little villages belonging to it became *wakf* (pious endowment) of the shrine at Shiraz of Mïr Ahmed, surnamed Shah Chiragh, a son of Musa Kazim, the seventh imām of the Shiahs, and the remainder of the Maimand grounds was given to the shrine by Mīr Habbib Ullah Sharifi and by Shah Ismail in 1504; the administration of the Maimand property as well as the guardianship of the shrine is still with the descendants of Mīr Habbib Ullah.

MAIMBOURG, LOUIS (1610-1686), French Jesuit and historian, was born at Nancy. He entered the Society of Jesus at the age of sixteen, and after studying at Rome became a classical master in the Jesuit college at Rouen. He afterwards devoted himself to preaching, but with only moderate success. After having taken some part in minor controversies he threw himself with energy into the dispute which had arisen as to the Gallican liberties; for his *Traité historique sur les prérogatives de l'Église de Rome* (1682) he was by command of Innocent XI. expelled from the Society, but rewarded by Louis XIV. with a residence at the abbey of St Victor, Paris, and a pension. He died on the 13th of August 1686. His numerous works include histories of Arianism, the iconoclastic controversy, the Greek schism, Lutheranism, Calvinism, and of the pontificates of Leo I. and Gregory I.; they are mere compilations, written indeed in a very lively and attractive style, but inaccurate and untrustworthy.

The History of Arianism was published in English (1728-1729) by William Webster, with an appendix on the English writers in the Socinian and Arian controversies.

MAIMING, mutilation, a physical injury which involves the loss of, or incapacity to use, a bodily member. The verb "to maim," in M. E. *maynhe*, *mahayme*, *mayme*, &c. was adopted from O. Fr. *mahaignier*: cf. It. *magagnars*, Med. Lat. *mahemiare*, *mahennare*, &c. (see Du Cange, *Gloss.*, *s.v.* "Mahamium"). Maiming or mutilation is and has been practised by many races with various ethnical and religious significances, and was a customary form of punishment on the principle of an "eye for an eye" (see Mutilation). In law "maiming" is a criminal offence; the old law term for a special case of maiming of persons was "mayhem" (*q.v.*), an Anglo-French variant form of the word. Maiming of animals by others than their owners is a particular form of the offences generally grouped as "malicious damage." For the purpose of the law as to this offence animals are divided into cattle, which includes horses, pigs and asses, and other animals which are either subjects of larceny at common law or are usually kept in confinement or for domestic purposes. The punishment for maiming of cattle is three to fourteen years' penal servitude. Malicious injury to other animals is a misdemeanour punishable on summary conviction. For a second offence the penalty is imprisonment with hard labour for over twelve months. (Malicious Damage Act 1861.) Maiming of animals by their owner falls under the Cruelty to Animals Acts.

MAIMON, SALOMON (1754-1800), German philosopher, was born of Jewish parentage in Polish Lithuania, and died at Nieder-Siegersdorf on the 22nd of November 1800. He married at the age of twelve, and studied medicine in Berlin. In 1770 he severed his connexion with his orthodox co-religionists by his critical commentary on the *Moreh Nebuḥim* of Maimonides, and devoted himself to the study of philosophy on the lines of Wolff and Moses Mendelssohn. After many vicissitudes he found a peaceful residence in the house of Count Kalkreuth at Nieder-Siegersdorf in 1790. During the ensuing ten years he published the works which have made his reputation as a critical philosopher. Hitherto his life had been a long struggle against difficulties of all kinds. From his autobiography, it is clear that his keen critical faculty was developed in great

measure by the slender means of culture at his disposal. It was not till 1788 that he made the acquaintance of the Kantian philosophy, which was to form the basis of his lifework, and as early as 1790 he published the *Versuch über die Transcendentalphilosophie*, in which he formulates his objections to the system. He seizes upon the fundamental incompatibility of a consciousness which can apprehend, and yet is separated from, the "thing-in-itself." That which is object of thought cannot be outside consciousness; just as in mathematics $\sqrt{-1}$ is an unreal quantity, so "things-in-themselves" are *ex hypothesi* outside consciousness, *i.e.* are unthinkable. The Kantian paradox he explains as the result of an attempt to explain the origin of the "given" in consciousness. The *form* of things is admittedly subjective; the mind endeavours to explain the *material* of the given in the same terms, an attempt which is not only impossible but involves a denial of the elementary laws of thought. Knowledge of the given is, therefore, essentially incomplete. Complete or perfect knowledge is confined to the domain of pure thought, to logic and mathematics. Thus the problem of the "thing-in-itself" is dismissed from the inquiry, and philosophy is limited to the sphere of pure thought. The Kantian categories are, indeed, demonstrable and true, but their application to the given is meaningless and unthinkable. By this critical scepticism Maimon takes up a position intermediate between Kant and Hume. Hume's attitude to the empirical is entirely supported by Maimon. The casual concept, as given by experience, expresses not a necessary objective order of things, but an ordered scheme of perception; it is subjective and cannot be postulated as a concrete law apart from consciousness. The main argument of the *Transcendentalphilosophie* not only drew from Kant, who saw it in MS., the remark that Maimon alone of his all critics had mastered the true meaning of his philosophy, but also directed the path of most subsequent criticism.

Maimon's chief works, in addition to the above quoted, are *Philos. Wörterbuch* (1791); *Streifereien im Gebiete der Philos.*(1793); *Über die Progresse der Philos.* (1793); *Die Kategorien des Aristoteles mit Anmerkungen erläutert* (1794); *Versuch einer neuen Logik* (1794 and 1798); *Kritische Untersuchungen über den menschl. Geist* (1797). See *S. Maimons Lebensgeschichte von ihm selbst beschrieben* (1792, ed. K. P. Moritz; Eng. trans. by J. C. Murray, 1888); Wolff, *Maimoniana* (1813); Witte, *S. Maimon* (1876).

MAIMONIDES, the common name of Rabbi Moses ben Maimon (1135-1204), also known from the initials of these last words as Rambam, Jewish philosopher. His life falls into three epochs, which may be typified by the towns in which they were passed, viz. Cordova, Fez and Cairo. He was born in Cordova on the 20th of March 1135, the eve of Passover; he had a brother, David, and one sister. His early years were spent in his native town, which had then just passed the zenith of its glory. The Arab rulers had fostered the development of science, art, medicine, philosophy, literature and learning. All these influences played their part in the education of Maimonides, whose father, besides training him in all branches of Hebrew and Jewish scholarship, implanted in the youth a sound knowledge of these secular studies as well. In 1148 Cordova was taken from the last Fatimite caliph by the victorious Almohades, who had spread over Spain from N. Africa. These militant revivalists strove to re-establish Islam in what they considered its primitive simplicity. They laid great stress on the unity of God, and tolerated neither schism within the faith nor dissent without. The position of the orthodox Spanish Jews became intolerable, and Maimon, after ten years of hardships, wanderings and escapes, decided to take his family out of the country. He settled in Fez. The years which Maimonides spent there (1160-1165) were memorable for his friendship with Abdul Arab Ibn Muisha—a Moslem poet and theologian—and for the commencement of his literary activity. His energies were diverted towards stimulating the religious feelings of his brethren and combating assimilation. In consequence he became alarmed for his own safety, and in 1165 left for Egypt, where he settled after a passing visit to the Holy Land. Cordova taught him the humanities; Fez humanity. Cairo, besides giving him prominence at court and in the Jewish community, was the centre of the almost world-wide influence which he exercised over Jewry by his monumental writings and dominant personality. By 1177 Maimonides was the recognized chief of the Cairene congregation and consulted on important matters by communities far and wide. Here he was joined by his most famous disciple, Joseph Aknin. But his early life in Egypt was fraught with deep sorrow. His father died soon after their arrival, and Maimonides himself suffered severely from prostration and sickness. His brother David, jointly with whom he carried on a trade in gems, was shipwrecked in the Indian Ocean. With him perished the entire fortune of the family. Forced to earn a livelihood, Maimonides turned to medicine. The fame of his skill eventually brought him the appointment of body physician to Saladin, to whom, it is said, he was so attached that when Richard I. wrote from Ascalon, offering him a similar post at the English court, Maimonides refused. He married the sister of Ibn al Māli, one of the royal secretaries. In 1186, his son Abraham was born. His remaining years were spent in ceaseless activity and in controversy, which he sought to avoid. He died amidst universal sorrow and veneration.

The works of Maimonides fall into three periods: (*a*) To the Spanish period belong his commentary on the whole Talmud (not fully carried out), a treatise on the calendar (*Maamar ha-ibbur*), a treatise on logic (*Milloth Higgayon*), and his commentary on the *Mishnah* (this was called *Siraj* or *Maor*, *i.e.* "Light": begun 1158, completed 1168 in Egypt). (*b*) While he was in Fez, he wrote an essay on the Sanctification of the Name of God (*Maamar Kiddush Hashem*, *Iggereth Hashemad*). (*c*) The works written in Egypt were: Letter to the Yemenites (*Iggereth Teman* or *Pethaḥ Tiqvah*); *Responsa* on questions of law; Biblical and Rabbinical Code (*Misnheh Torah* or *Yad Hahazaka*, completed 1180); *Sepher hamitzvoth*, an abbreviated handbook of the preceding; and his great philosophical work *Moreh Nebuḥim* or "the guide of the perplexed" (1190). To these must be added certain portions of the *Mishnah* commentary, such as the "Eight Chapters," the discussion on reward and punishment and immortality, the Jewish Creed, which have acquired fame as independent works.

The influence of Moses ben Maimon is incalculable. "From Moses unto Moses there arose not one like Moses," is the verdict of posterity. Maimonides was the great exponent of reason in faith and toleration in theology. One of the main services to European thought of the "Guide" was its independent criticism of some of Aristotle's principles. His codification of the Talmud was equally appreciated in the study of the scholar and

in practical life. Christian Europe owed much to Maimonides. Not only did his “Guide” influence scholasticism in general, but it was from his Code that the Church derived its medieval knowledge of the Synagogue.

A complete bibliography will be found in *Maimonides*, by David Yellin and Israel Abrahams (London, 1903); the final chapter of that work gives a summary of the influence of Maimonides on Christian philosophers such as Aquinas, and Jewish such as Spinoza. The “Guide” has been translated into English by M. Friedlander (1881-1885; new ed., 1905). See also *Jewish Encyclopedia*, articles *s.v.*, and the volumes edited by Guttmann, *Moses ben Maimon* (Leipzig, 1908, &c.).

(H. Le.)

MAIN (Lat. *Moenus*), a river of Germany, and the most important right-bank tributary of the Rhine. It has two sources, the Weisse Main (White Main), which rises in the Fichtelgebirge on the east side of the Ochsenkopf, and the Rote Main (Red Main), which, rising on the eastern slope of the Frankish Jura, flows past Bayreuth. They unite 3 m. below Kulmbach, 920 ft. above the sea. Hence the river, already of considerable size, pursues a north-westerly direction, skirting the spurs of the Frankish Jura in a pleasant valley. At Lichtenfels the river takes a south-westerly course, which it retains until entering the fertile basin of Bamberg. Here it receives from the south-east the waters of its chief tributary, the Regnitz, and enters upon its middle course. Its direction is now again north-west, and meandering through pleasant vales and pastures it passes Hassfurt and reaches Schweinfurt. Its course is now almost due south to Ochsenfurt, when it again proceeds north-west. Continuing in this direction amid vine-clad hills, it washes the walls of the university city of Würzburg, and thence, dividing the forest-clad ranges of the Spessart and the Odenwald, reaches Gemünden. Here it is joined from the right by the Frankish Saale and, turning abruptly south, receives at Wertheim the beautiful Tauber. Feudal castles and medieval towns now crown its banks, notably, Freudenberg and Miltenberg. From the latter it proceeds due north to Aschaffenburg, whence passing Frankfort it pours its yellow waters into the green waters of the Rhine just above Mainz. The Main has a total length of 310 m. and drains a basin of approximately 11,000 sq. m. It is navigable from the confluence of the Regnitz, 240 m. from its mouth, for barges and other small craft, and through the Ludwig Canal is connected with the Danube.

See Ulrici, *Das Maingebiet in seiner natürlichen Beschaffenheit* (Kassel, 1885); E. Faber, *Zur Hydrographie des Maingebiets* (Munich, 1895), and Lill, *Mainthal, Main und Mainschiffahrt* (Berlin, 1904).

MAIN (from the Aryan root which appears in “may” and “might,” and Lat. *magnus*, great), a word meaning properly power or strength, especially physical. This use chiefly survives in the expression “with might and main.” The word is more common as a substantival elliptical use of the adjective, which usually has the sense of principal or chief in size, strength, importance, &c. Thus “the main,” the high open sea, is for “main sea,” cf. “mainland,” the principal part of a territory excluding islands and sometimes far-projecting peninsulas. The expression “the Spanish main” properly meant that part of the main land of the N.E. coast of South America stretching from the Orinoco to the Isthmus of Panama, and the former Spanish possessions in Central America bordering on the Caribbean Sea, but it is often loosely used, especially in connexion with the buccaneers, of the Caribbean Sea itself. The term “main” is also thus used of a principal pipe or cable for conducting gas, water, electricity, &c. The elliptical use does not appear, however, in such expressions as main road, line, stream. Another use of the word “main” has a somewhat obscure history. It appears as a term in the game of hazard, and also in cock-fighting. In the last it is used for a match, and for the cocks engaged in a match. In hazard it is the number called by the “caster” before the dice are thrown; this may be any number from five to nine inclusive. The usual derivation is from the French *main*, a hand, but according to the *New English Dictionary* there is no evidence for this, and the more probable explanation is that it is an adaptation of “main” meaning principal or chief. From this use of the word in hazard the expression “main chance” is derived. “Main,” a shortened form of domain or demesne, only now survives in Scotland, usually in the plural “mains” for a home farm.

MAINA (or Mani) and MAINOTES, a district and people of the Peloponnesus, the modern Morea. Maina is the country occupied by the mountain range of Taygetus from Sparta to Cape Matapan, the ancient Taenarum. It is now divided between the modern districts Oetylos and Gythion. Before the organization of the present kingdom of Greece, Maina was subdivided into Εξω Μάνη, Outer Maina, from the frontier of Kalamata, on the Gulf of Messenia, to Vitylo (Oetylos) and inland to the summit of Taygetus; Κάτω Μάνη, Lower Maina, from Vitylo to Cape Matapan; and Μέσα Μάνη, or Inner Maina, on the east, and on the Gulf of Laconia as far as the plain of Elos. It contained over a hundred villages. The country is mountainous and inaccessible, a formation to which it owes its historical importance. The Mainotes claim to descend from the Spartans, and

probably represent the Eleuthero, or free, Laconians who were delivered by Rome from the power of Sparta, as is suggested by the traces of ancient Greek in their dialect and by their physical type. Their country being a natural fortress, they were able to defend themselves against the Byzantine emperors, the barbarians who broke into the empire, the Latin princes of Achaea of the house of Villehardouin, and the Turks. As their country is also poor and maritime, they were early tempted to take to piratical adventure. Gibbon says that "in the time of Constantine Porphyrogenitus they had acquired the name of Mainotes, under which they dishonour the claim of liberty by the inhuman pillage of all that is shipwrecked on their rocky shore." Their neighbours gave their country the name of "Kakaboulia"—the land of wicked counsels. The passes of their mountains were elaborately fortified and their villages were full of fortified towers (*pyrgoi*) from which they formed their own favourite epithet, Maina Polypyrgos—many-towered Maina. On the western side it also contains the remains of feudal keeps, erected by William II. de Villehardouin (1245-1278) and other Latin princes of Achaea. The Mainotes did not become Christians till the 9th century. From the 15th till the 17th century they recognized a family which claimed to belong to the Comneni of Trebizond as head chiefs. But the real power was in the hands of the chiefs of the different families and villages, who formed a turbulent and martial aristocracy. Enduring and ferocious feuds were common among them. In the course of the 18th century the family of Mavromicheli (Black Michael), which belonged to lower Maina, established a general headship over the Mainotes after much strife and many murders. When Russia endeavoured to promote a rising against the Turks in the Morea in 1770 the Mainotes acted with her, and the strength of their country enabled them to escape the vengeance of the Turks when the Christians were cynically deserted by the Russians. In 1777 their practical independence was recognized by the sultan's officers. During the Greek war of independence the Mainotes were chiefly led by Petros (Petro Bey) Mavromicheli, known to his countrymen as the king of Maina, who undoubtedly cherished the hope of establishing a principality for himself. The freedom of Greece, for which he had fought in his own way, proved the ruin of his ambition. He found the new order less compatible with his schemes than the Turkish dominion. Petro Bey was imprisoned by the Greek president Capodistrias (see Capo d'Istria, Count.), who was in revenge murdered by the Mavromichelis. The family were finally content to become courtiers and officials in the reign of King Otto I. In the 19th century Maina was but little affected by civilization, except in so far as the efficiency of modern navies debarred the Mainotes from their old resource of piracy.

See W. Martin Leake, *Travels in the Morea* (1830); M. E. Yemeniz, "La Maina," in *Revue des deux mondes* (March 1, 1865); and Philipson, "Zur Ethnographie des Peloponnes," in *Petermanns Mittheilungen*, vol. 36 (Gotha).

MAINE, ANNE LOUISE BÉNÉDICTE DE BOURBON, Duchesse du

(1676-1753), daughter of Henri Jules de Bourbon, prince de Condé and Anne of Bavaria, was born on the 8th of November 1676. On the 19th of March 1692 she married Louis Auguste de Bourbon, duc du Maine, son of Louis XIV. and Mme de Montespan. The duchesse du Maine held a little court at Sceaux, where she gave brilliant entertainments and immersed herself in political intrigues. Displeased with the action of the regent Orleans in degrading the illegitimate children of Louis XIV. from their precedence above the peers of France, she induced her husband to join in the Cellamare conspiracy for the transference of the regency to the king of Spain. The plot, however, was discovered, and she was imprisoned in 1719. The following year she returned to Sceaux, where she resumed her salon and gathered round her a brilliant company of wits and poets. She died in Paris on the 23rd of January 1753.

See Général de Piépape, *La Duchesse du Maine* (1910).

MAINE, SIR HENRY JAMES SUMNER

(1822-1888), English comparative jurist and historian, son of Dr James Maine, of Kelso, Roxburghshire, was born on the 15th of August 1822. He was at school at Christ's Hospital, and thence went up to Pembroke College, Cambridge, in 1840. At Cambridge he was one of the most brilliant classical scholars of his time. He won a Craven scholarship and graduated as senior classic in 1844, being also senior chancellor's medallist in classics. Shortly afterwards he accepted a tutorship at Trinity Hall. In 1847 he was appointed regius professor of civil law, and he was called to the bar three years later; he held this chair till 1854. Even the rudiments of Roman law were not then included in the ordinary training of English lawyers; it was assumed at the universities that any good Latin scholar could qualify himself at short notice for keeping up such tradition of civilian studies as survived. Maine cannot have known much Roman law in 1847, but in 1856 he contributed to the *Cambridge Essays* the essay on Roman law and legal education, republished in the later editions of *Village Communities*, which was the first characteristic evidence of his genius. Meanwhile he had become one of the readers appointed by the Inns of Court, in the first of their many half-hearted attempts at legal education, in 1852. Lectures delivered by Maine in this capacity were the groundwork of *Ancient Law* (1861), the book by which his reputation was made at one stroke. Its object, as modestly stated in the preface, was "to indicate some of the earliest ideas of mankind, as they are reflected in ancient law, and to point out the relation of those ideas to modern thought." Within a year of its publication the post of legal member of council in India was offered to Maine, then a junior member of the bar with little practice, few advantages of connexion, and no political or official claims. He declined

once, on grounds of health; the very next year the office was again vacant. This time Maine was persuaded to accept, not that his health had improved, but that he thought India might not make it much worse. It turned out that India suited him much better than Cambridge or London. His work, like most of the work done by Englishmen in India in time of peace, was not of a showy kind—its value is shown by the fact that he was asked to prolong his services beyond the regular term of five years, and returned to England only in 1869. The subjects on which it was his duty to advise the government of India were as much political as legal. They ranged from such problems as the land settlement of the Punjab, or the introduction of civil marriage to provide for the needs of unorthodox Hindus, to the question how far the study of Persian should be required or encouraged among European civil servants. On the civil marriage question in particular, and some years earlier on the still more troublesome one of allowing the remarriage of native converts to Christianity, his guidance, being not only learned but statesmanlike, was of the greatest value. Plans of codification, moreover, were prepared, and largely shaped, under Maine's direction, which were carried into effect by his successors, Sir J. Fitzjames Stephen and Dr Whitley Stokes. The results are open to criticism in details, but form on the whole a remarkable achievement in the conversion of unwritten and highly technical law into a body of written law sufficiently clear to be administered by officers to many of whom its ideas and language are foreign. All this was in addition to the routine of legislative and consulting work and the establishment of the legislative department of the government of India on substantially its present footing.

Maine's power of swiftly assimilating new ideas and appreciating modes of thought and conduct remote from modern Western life came into contact with the facts of Indian society at exactly the right time, and his colleagues and other competent observers expressed the highest opinion of his work. In return Maine brought back from his Indian office a store of knowledge which enriched all his later writings, though he took India by name for his theme only once. This essay on India was his contribution to the composite work entitled *The Reign of Queen Victoria* (ed. T. H. Ward, 1887). Not having been separately published, it is perhaps the least known of Maine's writings; but its combination of just perception and large grasp with command of detail is not easily matched outside W. Stubbs's prefaces to some of the chronicles in the Rolls series, and (more lately) F. W. Maitland's monographs. As vice-chancellor of the university of Calcutta, Maine commented, with his usual pregnant ingenuity, on the results produced by the contact of Eastern and Western thought. Three of these addresses were published, wholly or in part, in the later editions of *Village Communities*; the substance of others is understood to be embodied in the Cambridge Rede lecture of 1875, which is to be found in the same volume. The practical side of Maine's experience was not long lost to India; he became a member of the secretary of state's council in 1871, and remained so for the rest of his life. In the same year he was gazetted a K.C.S.I. In 1869 Maine was appointed to the chair of historical and comparative jurisprudence newly founded in the university of Oxford by Corpus Christi College. Residence at Oxford was not required, and the election amounted to an invitation to the new professor to resume and continue in his own way the work he had begun in *Ancient Law*. During the succeeding years he published the principal matters of his lectures in a carefully revised literary form: *Village Communities in the East and the West* (1871); *Early History of Institutions* (1875); *Early Law and Custom* (1883). In all these works the phenomena of societies in an archaic stage, whether still capable of observation or surviving in a fragmentary manner among more modern surroundings or preserved in contemporary records, are brought into line, often with singular felicity, to establish and illustrate the normal process of development in legal and political ideas.

In 1877 the mastership of Trinity Hall, Cambridge, where Maine had formerly been tutor, became vacant. There were two strong candidates whose claims were so nearly equal that it was difficult to elect either; the difficulty was solved by a unanimous invitation to Maine to accept the post. His acceptance entailed the resignation of the Oxford chair, though not continuous residence at Cambridge. Ten years later considerations of a somewhat similar kind led to his election to succeed Sir William Harcourt as Whewell professor of international law at Cambridge. His all too short performance in this office is represented by a posthumous volume which had not received his own final revision, *International Law* (1888).

Meanwhile Maine had published in 1885 his one work of speculative politics, a volume of essays on *Popular Government*, designed to show that democracy is not in itself more stable than any other form of government, and that there is no necessary connexion between democracy and progress. The book was deliberately unpopular in tone; it excited much controversial comment and some serious and useful discussion.

In 1886 there appeared in the *Quarterly Review* (clxii. 181) an article on the posthumous work of J. F. M'Lennan, edited and completed by his brother, entitled "The Patriarchal Theory." The article, though necessarily unsigned (in accordance with the rule of the *Quarterly* as it then stood), was Maine's reply to the M'Lennan brothers' attack on the historical reconstruction of the Indo-European family system put forward in *Ancient Law* and supplemented in *Early Law and Custom*. Maine was generally averse from controversy, but showed on this occasion that it was not for want of controversial power. He carried the war back into the invader's country, and charged J. F. M'Lennan's theory of primitive society with owing its plausible appearance of universal validity to general neglect of the Indo-European evidence and misapprehension of such portions of it as M'Lennan did attempt to handle.

Maine's health, which had never been strong, gave way towards the end of 1887. He went to the Riviera under medical advice, and died at Cannes on the 3rd of February 1888. He left a wife and two sons, of whom the elder died soon afterwards.

An excellent summary of Maine's principal writings may be seen in Sir Mountstuart Grant Duff's memoir. The prompt and full recognition of Maine's genius by continental publicists must not pass unmentioned even in the briefest notice. France, Germany, Italy, Russia have all contributed to do him honour; this is the more remarkable as one or two English publicists of an older school signally failed to appreciate him. Maine warned his countrymen against the insularity which results from ignorance of all law and institutions save one's own; his example has shown the benefit of the contrary habit. His prominent use of Roman law and the wide range of his observation have made his works as intelligible abroad as at home, and thereby much valuable information—for example, concerning the nature of British supremacy in India, and the position of native institutions there—has been made the property of the world of letters instead of the peculiar and obscure possession of a limited class of British public servants. Foreign readers of Maine have perhaps understood even better than English ones that he is not the propounder of a system but the pioneer of a method, and that

detailed criticism, profitable as it may be and necessary as in time it must be, will not leave the method itself less valid or diminish the worth of the master's lessons in its use. The rather small bulk of Maine's published and avowed work may be explained partly by a fine literary sense which would let nothing go out under his name unfinished, partly by the drawbacks incident to precarious health. Maine's temperament was averse from the labour of minute criticism, and his avoidance of it was no less a matter of prudence. But it has to be remembered that Maine also wrote much which was never publicly acknowledged. Before he went to India he was one of the original contributors to the *Saturday Review*, founded in 1855, and the inventor of its name. Like his intimate friend Fitzjames Stephen, he was an accomplished journalist, enjoyed occasional article-writing as a diversion from official duties, and never quite abandoned it. The practice of such writing probably counted for something in the freedom and clearness of Maine's style and the effectiveness of his dialectic. His books are a model of scientific exposition which never ceases to be literature.

See Sir A. Lyall and others, in *Law Quart. Rev.* iv. 129 seq. (1888); Sir F. Pollock, "Sir Henry Maine and his Work," in *Oxford Lectures, &c.* (1890); "Sir H. Maine as a Jurist," *Edin. Rev.* (July 1893); Introduction and Notes to new ed. of *Ancient Law* (1906); Sir M. E. Grant Duff, *Sir Henry Maine: a brief Memoir of his Life, &c.* (1892); *Notes from a Diary*, *passim*; L. Stephen, "Maine" in *Dict. Nat. Biog.* (1893); Paul Vinogradoff, *The Teaching of Sir Henry Maine* (1904).

(F. Po.)

MAINE, an old French province, bounded N. by Normandy, E. by Orléanais, S. by Touraine and Anjou, and W. by Brittany. Before the Roman Conquest the region occupied by this province was inhabited by the Aulerci Cenomanni and the Aulerci Diablintes; under the Roman empire it consisted of two *civitates* comprised in the Provincia Lugdunensis Tertia—the Civitas Cenomannorum and the Civitas Diablintum, whose chief towns were Le Mans and Jublains. These two *civitates* were united during the barbarian period and formed a single bishopric, that of Le Mans, suffragan to the metropolitan see of Tours. Under the Merovingians and Carolingians the diocese of Le Mans corresponded to the Pagus Cenomanensis, and in the feudal period to the county of Maine. In the 16th century the county of Maine, with the addition of Perche, formed a military government—the province of Maine. Since 1790 this province has been represented approximately by the departments of Sarthe and Mayenne, the respective capitals of which are Le Mans and Laval. In 1855 the bishopric of Laval was separated from that of Le Mans. Maine was evangelized in the 3rd century by St Julian. After forming part of the kingdom of Syagrius, it was conquered by Clovis at the end of the 5th century. Owing to the scarcity of documents the history of Maine until the end of the 9th century is merged in the history of the bishops of Le Mans, which has come down to us in the *Actus pontificum Cenomannis in urbe degentium* (ed. Busson-Ledru, Le Mans, 1901), composed under the direction of Bishop Aldric (832-857). Roger (*c.* 892-*c.* 898) was perhaps the first hereditary count of Maine; the counts whose existence is certain are Hugh I. (*c.* 939-before 992), Hugh II. (before 992-1015), Herbert I. (1015-1032 to 1036), Hugh III. (1032 to 1036-1051), Herbert II. (1051-1062), William the Bastard (1063-1087), Robert Curthose (1087-1091), Hugh IV. (1091-1092) and Helias (1092-1110). Maine, which was in the vassalage of Anjou as early as the 9th century, was united to Anjou in 1110 by the marriage of Count Helias's daughter to Fulk V., count of Anjou, and passed to the English crown in 1154, when Henry Plantagenet (who was born at Le Mans) became king of England. In 1204, after the confiscation of the estates of John of England, Maine was united to France; in 1246 it was separated from France by Louis IX., who handed it over to his brother Charles, count of Provence. Again united to France in 1328, it was given in 1356 as an apanage to Louis, second son of King John II., and did not definitely return to the French crown until 1481, after the death of Charles II., count of Maine. During the Hundred Years' War Maine was taken in 1425 by the English, who lost it in 1448.

See *Histoire de l'église du Mans*, by Dom Piolin (Paris, 1851-1858), which is useful but out of date; *Revue historique et archéologique du Maine* (1876); *La Province du Maine* (1893); B. Hauréau, *Histoire littéraire du Maine* (1870-1877).

MAINE, a North Atlantic state of the United States of America, the most north-easterly state in the Union, and the largest of the New England group. It lies between 43° 4′ and 47° 27′ 33″ N., and between 66° 56′ 48″ and 71° 6′ 41″ W. It is bounded N.W. by the Canadian province of Quebec; N. and E. by the Canadian province of New Brunswick, from which it is separated in part by the natural barriers of the Saint John River, the Grand (or Schoodic) Lakes, the Saint Croix River, and Passamaquoddy Bay; S.S.E. by the Atlantic Ocean; and W. by New Hampshire, the Piscataqua and Salmon Falls rivers being the natural boundary lines at the S.W. The area of the state is 33,040 sq. m., 3145 sq. m. being water surface.

Maine attracts more summer visitors than any other state in the Union. This is due to the cool and refreshing summer climate; the picturesque coast and its many islands, which are favourite grounds for camps and summer cottages; the mountains, and the beautiful lakes and rivers, many of which afford opportunities for good fishing and canoeing. Among the more widely known resorts are Mount Desert Island, on which is Bar Harbor, a fashionable summer place of great beauty; Long Island, Orr's and other islands in Casco Bay; Old Orchard, with a gently sloping white sand sea-beach 9 m. long, Rangeley and Moosehead Lakes, favourite resorts of fishermen and hunters; Mt Katahdin, in the heart of the moose country; and Poland Springs (38 m. by rail from Portland) in Androscoggin county, near lake Anasigunticook. About 1870, camps, summer

cottages, summer hotels and boarding houses began to multiply throughout the state. The needs of this summer population gave a new impulse and a new turn to agriculture; and the demand for souvenirs revived among the Indians basket-weaving, moccasin-making, and such crafts.

Physical Features.—The surface is a gently rolling upland, forming a part of the "New England uplands," above which rise isolated mountain peaks and clusters of peaks, and below which are cut numerous river valleys.[1] The highest peak is Mt Katahdin (5200 ft.), a little N.E. of the centre of the state in Piscataquis county, which rises from a comparatively level upland. South-west of Katahdin, in Franklin county, are most of the other high peaks of the state: Saddleback Mountain (4000 ft.), Mt Abraham (3388 ft.), Mt Bigelow (3600 ft.), and Mt Blue (3200 ft.). A little N. of this line of mountain peaks is the water-parting which divides the state into a north slope and a south slope. The north slope descends gently both to the N. and to the E.; although quite hilly in the middle and western portions it is so poorly drained that swamps abound in all sections. The south slope which contains nearly all the mountains and is generally more hilly, has a mean descent toward the sea of about 7 ft. to the mile, the fall being greater in the W., where the mountains are high at the N. and the shore low at the S., and less to the E., where the water-parting is lower and the shore high and rocky.

After the uplift which caused the rivers to cut below the general "uplands," and develop well marked valleys for themselves, came the period of the great continental glaciation. The glacier or ice sheet overran all Maine, irregularly scouring out the bed rock to produce rock basins, damming up many river valleys with glacial deposits and completely disarranging the drainage lines. When the ice melted, the rock basins and the dammed-up valleys filled with water to produce lakes. This is the origin of the numerous lakes of Maine, which give it some of its most beautiful scenery, and help to make it a holiday resort in summer. These lakes are about 1600 in number, are scattered in all parts of the state, are especially numerous at high elevations, and have an aggregate area of more than 2000 sq. m. Few other regions have so many large lakes so variously situated, and with such beauty of aspect and surroundings. They contribute largely to a constant supply of water power for which the course of the rivers of S.W. Maine are exceptionally well adapted, many of them abound in trout, salmon, togue, black bass and pickerel; and near them there is still much game. Moosehead Lake (about 120 sq. m.; 35 m. long and from 2 m. to 10 m. wide), on the boundary between Piscataquis and Somerset counties, is the largest in Maine and the largest inland body of water wholly in New England; the Kennebec River is its principal outlet and Mt Kineo rises abruptly to about 1760 ft. above the sea (about 700 ft. above the lake) on its eastern shore. Other lakes, such as the Rangeley Lakes,[2] Chesuncook and Twin Lakes on the Penobscot, and the Grand or Schoodic Lakes, in the western boundary at the head waters of the Saint Croix River, equal or surpass Moosehead in picturesqueness. The glacier or ice sheet, above referred to, deposited till or boulder clay, which was compacted under the enormous pressure of the ice sheet to form the "hard-pan" referred to later. The glaciation is also responsible for the poor soil of most of the state, for, although the rocks are the same crystallines which give good soils further south in unglaciated regions, all the decayed portions of the Maine rocks have been removed by glacial erosion, revealing fresh, barren rock over great areas, or depositing the rather sterile hard-pan as a thin coating in other places.

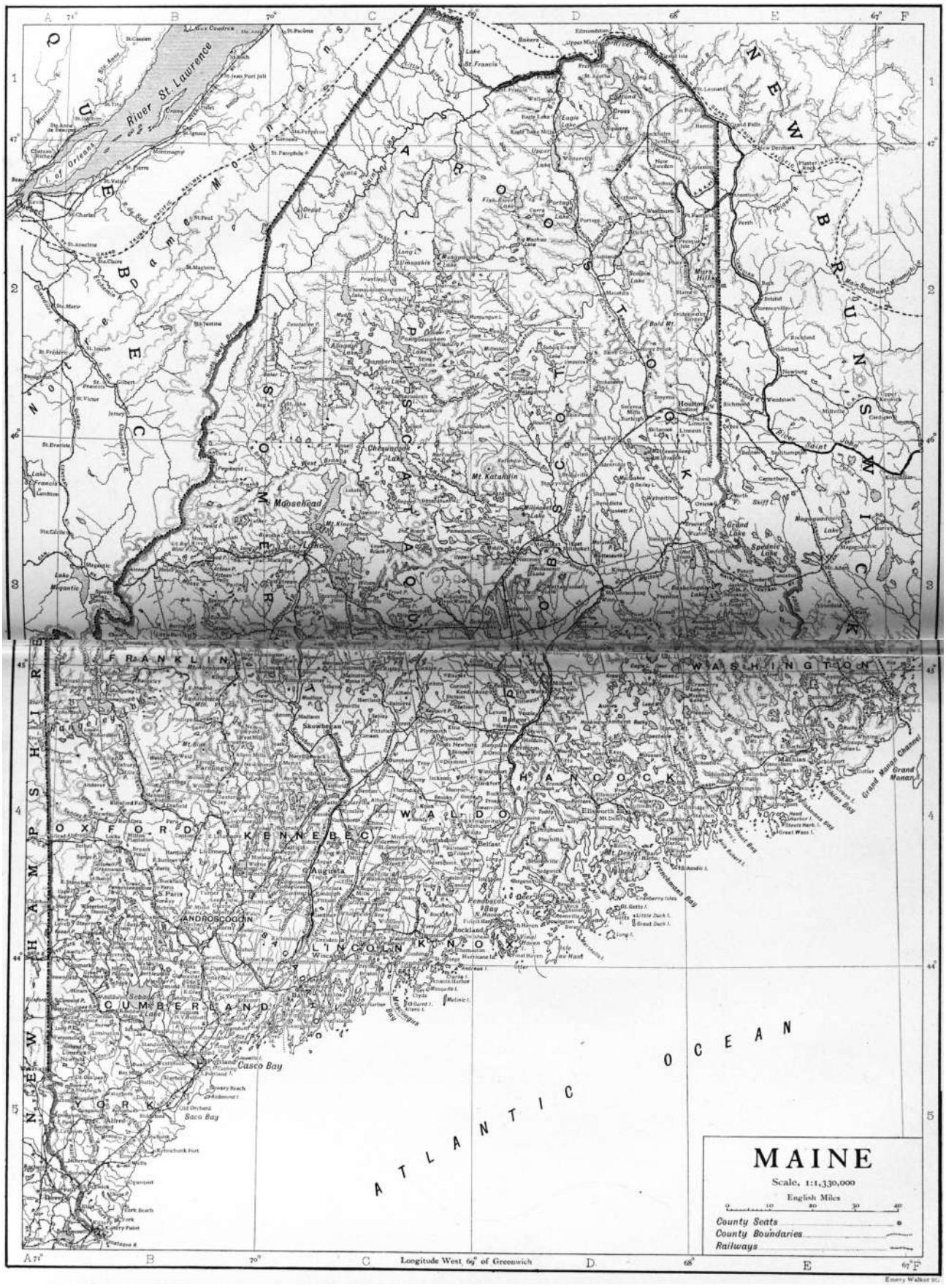
After the uplift came a period of subsidence, during which this region sank one or more thousand feet, allowing the sea to encroach on the land and run far inland into the previously made river valleys. This depression probably occurred during the glacial period, perhaps toward its close, and is responsible for the second most important feature of Maine physiography, the embayed coast. To this subsidence are due the picturesque coastal scenery, the numerous islands and bays, the good harbours and the peculiar coast-line.

The shortest distance between the N.E. and the S.W. extremities of the coast is only 225 m.; but, on account of projections and indentations, the coast-line measures not less than 2500 m. The headlands, the deep indentations and the numerous islands in the bays and beyond produce a beautiful mingling of land and sea and give to the whole ocean front the appearance of a fringed and tasselled border; west of the mouth of the Kennebec River are a marshy shore and many low grassy islands; but east of this river the shore becomes more and more bold, rising in the precipitous cliffs and rounded summits of Mt Desert and Quoddy Head, 1527 and 1000 ft. high respectively. All along the coast-line there are capacious and well-protected harbours, Casco, Penobscot, Frenchman's, Machias and Passamaquoddy bays being especially noteworthy.

After the subsidence came another period of uplift, possibly still in progress. This uplift has brought up submarine deposits of sand, &c., to form little coastal plains at some points along the coast, providing good land for settlement and clay for brick and pottery. Further evidence of this uplift is found in old beach lines now well above sea-level.

The principal river systems of Maine are the Saint John on the north slope, and the Penobscot, the Kennebec, the Androscoggin, and the Saco on the south slope. The mean height of the basin of the St John is exceeded only by that of the Androscoggin, but the fall of the St John River through the greater part of its course in Maine is only sufficient to give a sluggish or a gentle current. The Penobscot, Kennebec, Androscoggin and Saco have numerous falls and rapids.

Fauna.—The animal life of Maine shows a mixture of northern and southern forms, and very little that is peculiar as compared with surrounding regions. The state has moose, caribou and deer, especially in the northern part. The black bear, wolf, catamount, wolverine, wild cat, fox, beaver, racoon, marten, sable, woodchuck, skunk, otter, mink, rabbit and squirrel are also found. Geese, ducks and other water fowl frequent the lakes and bays in the migratory season, and eagles, gulls, hawks, kingfishers, owls, plover, woodcock, "partridge" (ruffed grouse), robins, orioles, bobolinks, blue birds, swallows, sparrows, and many other insectivorous birds are common. In the inland waters salmon, trout, togue (*Salvelinus namaycush*), pickerel and bass abound; along the shore there are lobsters, clams and scallops (*Pecten irradians*); and off the shore are herring, alewives, mackerel, cod, halibut, haddock, smelts, hake, menhaden, porgies and porpoises. The game in the North Woods attracts large numbers of sportsmen during the autumn season.



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Flora.—Maine was formerly covered with forests, principally of white pine and spruce, but mixed with these were some hemlock, tamarack, cedar, and, on the south slope, birch, poplar, oak, maple and beech. Chestnut and walnut are rare and are found only near the south-west border. In 1900 about 21% of the state's area was cleared, and much besides had once been cleared, but not being suited to agriculture had become reforested. Of fruit trees the chief is the apple. The plum, cherry and pear also thrive. The peach grows well only in the south-west near the border. Species of grape, gooseberry and currant are native, and others are cultivated with advantage. The blackberry, raspberry, blueberry and strawberry grow wild in profusion throughout the state.

Climate.—The climate of the state is moist and, for its latitude, cold. Extremes of temperature are not so

great as farther inland in the same latitude; for the summer heats are tempered by the sea and the cool north winds, and the winter cold is so constant as to be less severely felt than the changing temperature of more southern districts. The summers are short, there being only about 4½ months between frosts even in the southern sections, and the mean summer temperature is about 62° F. The mean winter temperature is approximately 20° F., and the mean annual temperature for the entire state is 42° F., that for the north slope being about 5° F. less than that for the south slope. Although the temperature remains pretty steadily below the freezing point for at least three months of the year, many of the harbours remain unobstructed; for the tides and the prevailing off-shore winds break up and drive off the ice. The precipitation is about 42 in. annually, and is distributed very evenly throughout the year, 10-11 in. of rain or its equivalent in snow falling each season. During 4½ months about 44% of the precipitation is in the form of snow; but the snow-fall varies from about 60 in. on the coast to more than 100 in. on the north slope. The winds are variable; at no season of the year is it usual for them to blow from the same direction for many days in succession. But, with the exception of those from the west, they are maritime and consequently moisture-bearing. In summer, especially in the latter part of it, the cool and moist N. or N.E. winds often cause a considerable part of the state to be enveloped in fog for several days in succession.

Agriculture.—The soil is for the most part glacial drift, containing a large mixture of clay with sand or gravel, and the subsoil is mostly "hard-pan," *i.e.* mingled clay and boulders which have been so much compressed by glacial action as to make the mixture hard and ledge-like. Except in the valley of the Aroostook and along the Kennebec, the Penobscot, and some other rivers, the soil is generally unfit for cultivation, there being too little alluvium mixed with it to make it fertile. In the Aroostook valley, however, is the largest undivided area of good arable land in all New England, the soil being a deep, porous, yellow loam well adapted to the growth of cereals and to market gardening. The most sterile regions are on the mountains and along the coast. Because of the cold climate, the large areas in which there is little or no good arable land, the growing demand for timber land, and the large and constant supply of water-power afforded by the principal rivers, agriculture in Maine, as in all the other New England states except Vermont, is a smaller industry than manufacturing; in 1900 there were 87,932 people engaged in manufacturing and only 76,932 engaged in agriculture. Only 32.9% of the state's land area was in that year included in farms, only 37.9% of this farm land was improved, and only 16.3% of the improved land was in crops other than hay and forage. Nevertheless, as indicated by the unusually large proportion of farmers who either own their farms or pay cash rent for them, farming usually is profitable. The number of farms in 1900 was 59,299; of these 18,644 contained between 50 and 100 acres and 17,191 contained between 100 and 175 acres, the average size being 106.2 acres; 54,263 (or 91.5%) were operated by their owners, 775 were operated by part owners, 2030 by cash tenants, and only 745 by share tenants. Beginning with the middle of the 19th century, the increasing competition of the more productive soils of the West, the growth of urban population in the state, and the number of summer visitors effected the reforesting of much poor land and the more intensive cultivation of the better arable land. The cultivation of cereals, for example, has given way to a marked extent in nearly all the farming districts except in Aroostook county to market gardening, dairying, and egg and poultry production. The number of dairy cows increased from 157,240 in 1890 to 183,000 in 1908, and the annual production of milk increased from 57,969,791 gallons in 1890 to 99,586,188 gallons in 1900. The number of other neat cattle (180,878 in 1900; 151,000 in 1908) decreased during every decade from 1860 to 1900; the number of sheep in 1900 was 427,209 (31.9% less than in 1890), and in 1908 it was 267,000; but the number of horses in 1890 and 1900 was about the same (140,310 in 1960, but only 116,000 in 1908). Hay is still by far the largest crop, the acreage of it and of forage in 1899 being 1,270,254 acres, or 76.5% of that of all crops, and the yield was 1,133,932 tons; in 1907 the acreage was 1,400,000 acres, and the crop was 2,100,000 tons. The acreage of cereals decreased from 187,013 in 1880, when agriculture in Aroostook county was little developed, to 166,896 in 1899, when the cereal acreage in Aroostook county alone was 82,069. Maine potatoes are of a superior quality, and the acreage of this crop increased from 49,617 in 1889 to 118,000 in 1907. Sweet Indian corn, cabbages, turnips, cucumbers and tomatoes are grown in large quantities. The fruit crop consists very largely of apples and strawberries (1,421,773 bushels of apples and 1,066,860 quarts of strawberries in 1899). The output of eggs increased from 9,369,534 dozen in 1889 to 13,304,150 dozen in 1899. The most productive dairy section of the state is a belt extending from the south-west corner N.E. entirely across the state and embracing the whole or parts of the counties of York, Oxford, Cumberland, Androscoggin, Kennebec, Penobscot and Aroostook.

Lumber Industry.—Except in the remote parts, the valuable white pine, for which Maine was long noted, has been cut; but the woodland of the state was estimated in 1900 at 23,700 sq. m. or 79% of its area. The tendency is for this area to increase, for the establishment between 1890 and 1900 of large paper and pulp mills on some of the principal rivers of the south slope greatly increased the value of forests, especially those of spruce and poplar. The state makes large appropriations for preventing and extinguishing forest fires, and in 1903 established a department of forestry in the university of Maine. Good spruce, which is by far the most valuable timber in the state and is used most largely for the manufacture of paper and pulp, stands in large quantities in the St John, Penobscot, Androscoggin and Kennebec basins. Poplar, also used for the manufacture of paper, abounds in several sections of the south slope, but is most abundant in the basin of the Kennebec. White birch, used largely for the manufacture of spools, is found throughout a wide belt extending across the middle of the state. There is much cedar on the north slope. Oak, maple and beech are rather scarce. A new growth of white pine and other timber is gradually becoming valuable. The value of the timber product increased from $11,849,654 in 1890 to $13,489,401 in 1900, and to $17,937,683 in 1905.

Fisheries.—Fishing has always been an important industry in Maine. From 1901 to 1904 inclusive, the average annual catch amounted to 195,335,646 lb, and its average value was $5,557,083. In 1908, according to state reports, the catch was 185,476,343 lb, valued at $3,849,900. Herrings are caught in largest quantities (in 1908, according to state reports, 68,210,800 lb, valued at $450,665), and Maine is noted for the canning of the smaller herrings under the name of "sardines." In 1908, according to state reports, the take of lobsters was 17,635,980 lb valued at $1,558,252. Maine markets more clams than any other state in the Union, and the catches of cod, hake, haddock, smelt, mackerel, swordfish, shad, pollock, cusk, salmon, alewives, eels and halibut are of importance. The scallop fishery is becoming more and more valuable. For the protection and promotion of the lobster fishery the United States government has established a lobster hatchery at Boothbay Harbor; and the state legislature enacted a law in 1895 prohibiting the taking of lobsters less than 10-1/2 in. in length (one effect of this law being to drive the lobster-canning industry from the state) and another law in 1903 for the protection of lobsters with eggs attached. This latter law directs the state fish commissioner to purchase such lobsters whenever caught and either to liberate them or to sell them to the United States for keeping in a fish hatchery.

Minerals.—The principal mineral products are granite, limestone, slate, clay products and mineral waters. In 1905 Maine held first rank among the states of the Union as a producer of granite, the value of the output being $2,713,795. In 1907 Maine's granite was valued at $2,146,420, that of Massachusetts at $2,328,777, and that of Vermont at $2,693,889. The stone is of superior quality, and the largest part of it is used for building purposes; much of it is used as paving blocks and some for monuments. It abounds all along the coast east of the Kennebec and on the adjacent islands, and is found farther inland, especially about the Rangeley lakes in Franklin and Oxford counties, and, near Mt Katahdin, in Penobscot and Piscataquis counties. The principal quarries, however, are situated in positions most convenient for shipment by water, in the vicinity of Penobscot bay and in Kennebec county, and these have supplied the bulk of the material used in the construction of many prominent buildings and monuments in the United States. The Fox Island granite comes from the quarries on Vinalhaven Island and the surrounding islands, and on Vinalhaven were quarried monolithic columns 51.5 to 54 ft. long and 6 ft. in diameter for the Cathedral of St John the Divine in New York City. Black granite was quarried in 1907 at 12 quarries, in York, Lincoln, Waldo, Penobscot and Washington counties. Limestone abounds, especially in the south-east part of the state, but it is quarried chiefly in Knox county. As its colour—blue and blue-black streaked with white—renders it undesirable for building purposes, nearly all of it is burned into lime, which has become a very important article of manufacture in the city of Rockland; the industry dates back to 1733 in Knox county. In 1907 the quantity of lime burned in Maine was 159,494 tons and its value was $747,947. Slate is quarried chiefly in Piscataquis county, most of it being used for roofing, but some for blackboards; in 1907 the amount quarried in Maine was valued at $236,106. About 1896 some remarkably white and pure feldspar began to be quarried in Androscoggin, Oxford and Sagadahoc counties, but afterwards the spar mined in Maine was of less excellent quality; in 1907 the production in Maine was valued at $157,334, the total for the entire country being $499,069. Clay is obtained in various places, and in 1905 the total value of the clay products was $619,294. In Oxford county tourmaline, spodumene (or kunzite) and beryl occur, the tourmaline crystals being notably large and beautiful. Mineral water occurs in many localities, particularly in Androscoggin, York, Cumberland and Oxford counties; the most famous springs are the Poland Springs in Androscoggin county. Most of the mineral waters bottled in the state are chalybeate and slightly alkaline—saline; their average temperature is about 43°. In 1908 27 springs were reported, their aggregate sales amounting to 1,182,322 gallons. Copper, gold alloyed with platinum, iron ore, barytes, graphite and lead occur in small quantities in the state. In 1908 the total mineral product of the state was valued at $7,044,678.

Manufactures.—Although Maine has no coal and only a very small amount of iron ore within her borders for the encouragement of manufacturing, yet the abundance of fine timber and the numerous coves, bays and navigable streams along or near the coast promoted ship-building from the first, and this was the leading industry of the state until about the middle of the 19th century, when wooden ships began to be supplanted by those of iron and steel. Until about the same time, when the Maine liquor law was passed, the manufacture of rum from molasses, received in exchange for lumber and fish in the West Indies, was also an important industry. It was not until early in the 19th century that the large and constant supply of water power afforded by the rivers began to be used to any considerable extent. The first cotton mill was built at Brunswick on the Androscoggin about 1809, and from 1830 the development of cotton manufacturing was rapid; woollen mills followed, and late in the 19th century were erected some of the largest paper and pulp mills in the country, which are run by water power from the rivers, and use the spruce and poplar timber in the river basins. The total value of the manufactures of the state increased from $95,689,500 in 1890 to $127,361,485 in 1900; and in 1905 the value of factory-made products alone was $144,020,197, or 27.5% greater than their value in 1900.[3] Measured by the value of the output, paper and wood pulp rose from fifth among the state's manufactures in 1890 to third in 1900 and to first in 1905; from $3,281,051 in 1890 to $13,223,275 in 1900, an increase of 303% within the decade, and to $22,951,124 in 1905, a further increase of 73.6% in this period. Lumber and timber products ranked second (1905)—$11,849,654 in 1890, $13,489,401 in 1900, and $17,937,683 in 1905. Cotton goods ranked third (1905) in value—$15,316,909 in 1890, $14,631,086 in 1900, and $15,404,823 in 1905. Woollen goods ranked fourth (1905)—$8,737,653 in 1890, $13,744,126 in 1900, an increase of 57.3% within the decade; and the value of the factory-made product alone in 1905 was $13,969,600, or 20.1% greater than in 1900. Boots and shoes ranked fifth (1905)—$12,295,847 in 1900, and $12,351,293 in 1905. Fish, canned and preserved, followed next, $1,660,881 in 1890 and $4,779,773 in 1900, an increase within the decade of 187.8%, most of which was in one branch—the canning of small herring under the name "sardines"; from 1900 to 1905 the increase was slight, only $275,358, or 5.8%. In the value of its manufactures as compared with those of the other states of the Union, in wooden ships and boats, Maine in 1900 and in 1905 was outranked by New York only; in canned and preserved fish by Washington only (the value of fish canned and preserved in Maine in 1900 was 21.7% of the total for the United States, and in 1905 19.2%); in the output of woollen mills by Massachusetts and Pennsylvania only; in the output of paper mills by New York and Massachusetts only. It ranked ninth in 1900 and tenth in 1905 in the value of its cotton goods. Portland, Lewiston, Biddeford, and Auburn are the leading manufacturing cities, and in 1905 the total value of their manufactures was 21.5% of those of the entire state. But from 1900 to 1905 the value of manufactures grew most rapidly in Rockland (especially noted for lime), the increase being from $1,243,881 to $1,822,591 (46.5%), and in Waterville, where the increase was from $2,283,536 to $3,069,309 (34.4%). Among the largest paper mills are those at Millinocket, in Penobscot county, at Madison on the Kennebec river, and at Rumford Falls on the Androscoggin river. Lewiston leads in the manufacture of cotton goods; Auburn, Bangor and Augusta, in the manufacture of boots and shoes; Bath, in ship and boat building; Eastport and Lubec, in canning "sardines."

Transportation and Commerce.—The south-western part of the state, including the manufacturing, the quarrying, and much of the older agricultural district, early had fairly satisfactory means of transportation either by water or by rail; for the coast has many excellent harbours, the Kennebec river is navigable for coast vessels to Augusta, the Penobscot to Bangor, and railway service was soon supplied for the villages of the south-west, but it was not until the last decade of the 19th century that the forests, the farming lands, and the summer resorts of Aroostook county were reached by a railway, the Bangor & Aroostook. The first railway in the state, from Bangor to Old Town, was completed in 1836, and the state's railway mileage increased from 12 m. in that year to 245 m. in 1850, to 1377.47 m. in 1890, and to 2210.79 in January 1909. The principal railway systems are the Maine Central, which enters every county but one, the Boston & Maine, the Bangor & Aroostook, the Grand Trunk and the Canadian Pacific. Lines of steamboats ply regularly between the largest cities of the state and Boston, between Portland and New York, and between Portland and several Canadian ports.

The foreign trade, especially that with the West Indies and with Great Britain, decreased after 1875, and yet much trade from the West that goes to Montreal during the warmer months passes through Portland during the winter season. The chief exports to foreign countries are textile fabrics, Indian corn, meat, dairy products, apples, paraffin, boards and shooks; the chief imports from foreign countries are sugar, molasses and wool. Fish, canned goods, potatoes, granite, lime, paper, and boots and shoes are also exported to foreign countries to some extent, but they are shipped in larger quantities to other states of the Union, from which Maine receives in return cotton, coal, iron, oil, &c. The ports of entry in Maine are Bangor, Bath, Belfast, Castine, Eastport, Ellsworth, Houlton, Kennebunk, Machias, Portland, Wiscasset and York.

Population.—The population in 1880 was 648,936; in 1890, 661,086; in 1900, 694,466; and in 1910, 742,371.[4] From 1880 to 1900 there was an increase of only 7%, a percentage which was exceeded in every other state in the Union except Nevada and Vermont. Of the total population of 1900, 599,291, or 86.3%, were native whites, 93,330 were foreign-born, 1,319 were negroes, 798 were Indians, 119 were Chinese, and 4 were Japanese. Of the inhabitants born in the United States, 588,211, or 97.8%, were natives of New England and 560,506 were natives of Maine, and of the foreign-born 67,077, or 71.8%, were natives of Canada (36,169 English and 30,908 French), and 10,159, or 10.8%, were natives of Ireland. Of the total population, 199,734 were of foreign parentage—*i.e.* either one or both parents were foreign-born—and 89,857 were of Canadian parentage, both on the father's and on the mother's side (41,355 English and 48,502 French). The French-speaking inhabitants probably number considerably more than 50,000. They are of two quite distinct classes. One, numbering about 15,000, includes those who became citizens by the establishment of the northern boundary in 1842 and their descendants. They are largely of Acadian stock. The state has established among them a well-appointed training school for teachers, conducted in the English language, the graduates of which render excellent service in the common schools. The other class is of French-Canadian immigrants, who find profitable employment in the manufacturing centres. The colony of Swedes established by the state near its north-eastern border in 1870 has proved in every way successful. The Indians are remnants of the Penobscot and Passamaquoddy tribes, the Passamaquoddies being a little the more numerous. The Penobscots' chief gathering places are on the islands of the Penobscot river north of Old Town; the Passamaquoddies', on the shores of Passamaquoddy Bay and the banks of the Saint Croix river.

Roman Catholics are more numerous than all the Protestant sects taken together, having in 1906 a membership of 113,419 out of a total of 212,988 in all denominations. In the last decade of the 19th century the urban population (*i.e.* population of places having 4,000 inhabitants or more) increased from 226,268 to 251,685, or 11.2%; the semi-urban population (*i.e.* population of incorporated places, or the approximate equivalent, having less than 4,000 inhabitants) increased from 14,221 to 26,674, or 87.5%; while the rural population (*i.e.* population outside of incorporated places) decreased from 420,597 to 416,134, or 1%. The principal cities of the state are: Portland, pop. (1910), 58,571; Lewiston, 26,247; Bangor, 24,803; Biddeford, 17,079; Auburn, 15,064; Augusta (the capital), 13,211; Waterville, 11,458; Bath, 9,396; Westbrook, 8,281; and Rockland, 8,174.

Administration.—Maine has had but one state constitution; this was ratified in December 1819, about three months before the admission of the state into the Union. It admits of amendment by a two-thirds vote of both houses of the legislature followed by a majority vote of the electorate at the next September election; or, as provided by an amendment adopted in 1875, the legislature may by a two-thirds vote of each house summon a constitutional convention. From 1819 to 1875 twelve amendments were adopted; in 1875, after nine more were added, the twenty-one were incorporated in the text; and between 1875 and 1899 nine more were adopted. Suffrage is conferred by the constitution on all male citizens of the United States who are at least twenty-one years of age and have, for some other reason than because of being in the military, naval or marine service of the United States, or of being students at college, lived in the state for three months next preceding any election; the following classes, however, are excepted: paupers, persons under guardianship, Indians not taxed, and, as provided by an amendment adopted in 1892, persons intellectually incapable of reading the state constitution in the English language or of writing their names. State elections were annual until 1897 when they were made biennial; they are held on the second Monday in September in even numbered years, Maine being one of the few states in the Union in which they are not held in November.

The governor is the only executive officer of the state elected by popular vote. There is no lieutenant-governor, the president of the Senate succeeding to the office of governor in case of a vacancy, but there is a council of seven members elected by the legislature (not more than one from any one senatorial district), whose sole function is to advise the governor. The governor's term of office is two years (before 1879 it was one year); and the constitution further directs that he shall be at least thirty years of age at the beginning of his term, that he shall be a native-born citizen of the United States, that when elected he shall have been a resident of the state for five years, and that he shall reside in the state while in office. His power of appointment is unusually extensive and the advice and consent of the council (instead of that of the Senate as in other states) are required for his appointments. He appoints all judges, coroners and notaries public, besides all other civil and military officers for whose appointment neither the constitution nor the laws provide otherwise. The governor is commander-in-chief of the state militia. Any bill of which he disapproves he can within five days after its passage prevent from becoming a law unless it is passed over his veto by a two-thirds vote of each house of the legislature. He and the council examine and pass upon election returns; he may summon extra sessions of the legislature, and he may grant pardons, reprieves, and commutations in all cases except impeachment, but the manner of hearing applications for pardon is in a measure prescribed by statute, and he must present to the legislature an account of each case in which he grants a pardon. His salary is $2,000 a year. The seven members of the council, the secretary of state, the treasurer, the attorney general and the commissioner of agriculture are elected biennially by a joint ballot of the two houses of the legislature, which also elects, one every two years, the three state assessors, whose term is six years.

The legislature meets biennially at Augusta, the capital, and is composed of a Senate of thirty-one members and a House of Representatives of one hundred and fifty-one members. Members of each house are elected for a term of two years: one senator from each senatorial district and one to seven representatives (one for a population of 1,500, and seven for a population of 26,250) from each township, or, where the township or plantation has less than 1,500 inhabitants, from each representative district, according to its population. There is a new reapportionment every ten years, counting from 1821. Every senator and every representative must at the beginning of his term have been for five years a citizen of the United States, for one year a resident of

the state, and for three months next preceding his election, as well as during his term of office, a resident of the township or district which he represents; and every senator must be at least twenty-five years of age. All revenue bills must originate in the House of Representatives, but to such bills the Senate may propose amendments provided they relate solely to raising revenue. Other bills may originate in either house. In September 1908 a constitutional amendment was adopted providing for referendum and initiative by the people. Any bill proposed in the legislature or passed by it must be referred to popular vote before becoming law, if there is a referendum petition therefor signed by 10,000 voters; and a petition signed by 12,000 voters initiates new legislation.

At the head of the department of justice is the supreme judicial court, which consists of a chief justice and seven associate justices appointed by the governor and council for a term of seven years. When it sits as a law court, at least five of its justices must be present, and it holds three such sessions annually: one at Augusta, one at Bangor, and one at Portland. But only one of its justices is required for a trial court, and trial courts are held two or three times a year in each county for the trial of both civil and criminal cases which come before it in the first instance or upon appeal. In Cumberland and Kennebec counties there is a superior court presided over by one justice and having extensive civil and criminal jurisdiction; and in each of the counties there are a probate court for the settlement of the estates of deceased persons and courts of the trial justice and the justice of the peace for the trial of petty offences and of civil cases in which the debt or damage involved does not exceed $20.

The principal forms of local government are the town (or township), the plantation, the county and the city. As in other parts of New England, the town is the most important of these. At the regular town meeting held in March the electorate of the town assembles, decides what shall be done for the town during the ensuing year, elects officers to execute its decisions with limited discretion, and votes money to meet the expenses. The principal officers are the selectmen (usually three), town clerk, assessors, collector, treasurer, school committee and road commissioner. A populous section of a town, in order to promote certain financial ends, is commonly incorporated as a village without however becoming a governing organization distinct from the town. Maine is the only state in the Union that retains what is known as the organized plantation. This is a governmental unit organized from an unincorporated township having at least 200 inhabitants,[5] and its principal officers are the moderator, clerk, three assessors, treasurer, collector, constable and school committee. The county is a sort of intermediate organization between the state and the towns to assist chiefly in the administration of justice, especially in the custody of offenders, and in the making and care of roads. Its officers are three commissioners, a treasurer, a register of deeds, a judge and a register of probate, and a sheriff. They are all elected: the commissioners for a term of six years, one retiring every two years, the register of deeds and the judge and the register of probate for a term of four years, and the others for two years. Among other duties the commissioners care for county property, manage county business and take charge of county roads. Maine has no general law under which cities are chartered, and does not even set a minimum population. A town may, therefore, be incorporated as a city whenever it can obtain from the legislature a city charter which a majority of its electorate prefers to a continuance under its town government; consequently there is much variety in the government of the various cities of the state.

By the laws of Maine the property rights of a wife are approximately equal to those of a husband. A woman does not lose nor a man acquire right to property by marriage, and a wife may manage, sell, or will her property without the assent of her husband. She may even receive as her own the wages of her personal labour which was not performed for her own family. In the absence of a will, bar or release, there is no legal distinction between the rights of a widower in the estate of his deceased wife and those of a widow in the estate of her deceased husband. The grounds for divorce in the state are adultery, impotence, extreme cruelty, desertion for three consecutive years next preceding the application, gross and confirmed habits of intoxication, cruel and abusive treatment, or a husband’s gross or wanton refusal or neglect to provide a suitable maintenance for his wife.

Under the laws of Maine a householder owning and occupying a house and lot may hold the same, or such part of it as does not exceed $500 in value, as a homestead exempt from attachment, except for the satisfaction of liens for labour or material, by filing in the registry of deeds a certificate stating his desire for such an exemption, provided he is not the owner of an exempted lot purchased from the state; and the exemption may be continued during the widowhood of his widow or the minority of his children. A considerable amount of personal property, including apparel, household furniture not exceeding $100 in value, a library not exceeding $150 in value, interest in a pew in a meeting-house, and a specified amount of fuel, provisions, tools or farming implements, and domestic animals, and one fishing boat, is also exempt from attachment.

Maine was the first state in the Union to enact a law for prohibiting the sale of intoxicating liquors. An act for restricting the sale of such liquors was passed in 1846; the first prohibitory act was passed, largely through the influence of Neal Dow, in 1851; this was frequently amended; and in 1884 an amendment to the constitution was adopted which declares the manufacture of intoxicating liquors and their sale, except “for medicinal and mechanical purposes and the arts,” forever prohibited. By the law enacted for enforcing this prohibition the governor and council appoint a state liquor commissioner from whom alone the selectmen of a town, the mayor or aldermen of a city, are authorized to receive the liquors which may be sold within the exceptions named in the amendment, and the selectmen, mayor or aldermen appoint an agent who alone is authorized to sell any of these liquors within their jurisdiction and who is forbidden to sell any whatever to minors, Indians, soldiers and drunkards. But the law labours under the disadvantage of all laws not vigorously sustained by general public sentiment, and is grossly violated. For the most part it is executed to the degree demanded by local sentiment in the several municipalities, thus operating in practice much the same as a “local option” law. The law looks to checking the demand by preventing the supply; and since habitual reliance on the stringency of law tends to the neglect of other influences for the removal of evils from the community, the citizens seem to absolve themselves from personal responsibility, both for the execution of the law and for the existence of the evil itself. There has been a strong movement for the repeal of the law, and the question of prohibition has long been an important one in state politics.

The death penalty was abolished in Maine in 1876, restored in 1883, and again abolished in 1887.

Penal and Charitable Institutions.—The state penal and reformatory institutions consist of the state prison at

Thomaston, the state (reform) school for boys at South Portland, and a state industrial school for girls at Hallowell, established in 1875 and taken over by the state in 1899. The two schools are not places of punishment, but reformatory schools for delinquent boys (from 8 to 16 years of age) and girls (from 6 to 16 years), who have been committed by the courts for violations of law, and, in the case of girls, who, by force of circumstances or associations, are "in manifest danger of becoming outcasts of society." The prison is in charge of a board of three inspectors and a warden, and each of the other two institutions is in charge of a board of trustees; the inspectors, warden, and trustees are all appointed by the governor and council. Convicts in the prison are usually employed in the manufacture of articles that are not extensively made elsewhere in the state, such as carriages, harness, furniture and brooms. The inmates of the state school for boys receive instruction in farming, carpentry, tailoring, laundry work, and various other trades and occupations; and the girls in the state industrial school are trained in housework, laundering, dressmaking, &c. Paupers are cared for chiefly by the towns and cities, those wholly dependent being placed in almshouses and those only partially dependent receiving aid at their homes. The charitable institutions maintained by the state are: the military and naval orphan asylum at Bath, the Maine institution for the blind at Portland, the Maine school for the deaf (established in 1876, and taken over by the state in 1897) at Portland, the Maine insane hospital at Augusta, the Eastern Maine insane hospital at Bangor, and a school for the feeble-minded (established in 1907) at West Pownal, each of which is governed by trustees appointed by the governor and council, with the exception of a part of those of the orphan asylum, who are appointed by the corporation. Besides the strictly state institutions, there are a number of private charitable institutions which are assisted by state funds; among these are the eye and ear infirmary at Portland, the Maine state sanatorium at Hebron for the treatment of tuberculosis, and various hospitals, orphanages, &c. The national government has a branch of the national home for disabled volunteer soldiers at Togus, and a marine hospital at Portland.

Education.—The school-district system was established in 1800 while Maine was still a part of Massachusetts and was maintained by the first school law passed, in 1821, by the state legislature; but, beginning in the next year, one town after another received the privilege of abolishing its districts, and in 1893 the system was abolished by act of the legislature. A state board of education, composed of one member from each county, was established in 1846, but for this was substituted, in 1852, a commissioner of schools for each county, appointed by the governor, and two years later a state superintendent of schools was substituted for the county commissioners. County supervision by county supervisors was tried in 1869-1872. Since these several changes the common school system has been administered by towns and cities subject to an increasing amount of control through enactments of the state legislature and the general supervision of the state superintendent. The town officers are a superintending school committee of three members and a superintendent. The members of the committee are elected for a term of three years, one retiring every year, and women as well as men are eligible for the office. The superintendent may be elected by the town or appointed by the committee, or towns having not less than twenty or more than fifty schools may unite in employing a superintendent. In cities the committee is usually larger than in towns and is commonly elected by wards. Since 1889 each town and city has been required to furnish textbooks, apparatus and supplies, without cost to the pupils. The minimum length of the school year is fixed by a statute of 1893 at twenty weeks; the average length is about twenty-eight weeks. A compulsory education law, enacted in 1901, requires the attendance at some public or approved private school of each child between the ages of seven and fifteen during all the time that school is in session, except that necessary absences may be excused. For the maintenance of the common schools each town is required (since 1905) to raise annually at least fifty-five cents *per capita*, exclusive of what may be received from other sources, and to this is added the proceeds of a state tax of one and a half mills on a dollar, one-half the proceeds of the tax on savings banks, a 6% income from the permanent school fund (derived mainly from the sale of school lands), and state appropriations for the payment in part of the superintendence in towns that have united for that purpose. Any section of a town may establish and maintain a high school provided there be not more than two such schools in one town, and the state makes appropriations for the support of such schools equal to one-half the cost of instruction, but the maximum grant to any one such school is $250.

The state maintains five normal schools: that at Farmington (established 1864), that at Castine (1866), that at Gorham (1879); that at Presque Isle (the Aroostook state normal school, 1903), and the Madawaska training school at Fort Kent, each of which is under the direction of a board of trustees consisting of the governor, the state superintendent of schools, and five other members appointed by the governor and council for not more than three years. At the head of the public school system is the university of Maine, near the village of Orono in Orono township (pop. in 1900, 3257), Penobscot county. This institution was founded in 1865 as the state college of agriculture and the mechanic arts; in 1897 the present name was adopted. It embraces a college of arts and sciences, a college of agriculture, a college of technology (including a department of forestry), a college of law (at Bangor), and a college of pharmacy. The most conspicuous of its twenty-five buildings is the library, built with funds contributed by Andrew Carnegie. In 1908-1909 the university had 104 instructors and 884 students, of whom 113 were in the college of law at Bangor and 420 in the college of technology. The university is maintained with the proceeds of an endowment fund derived chiefly from public lands given by the national government in accordance with the land grant, or Morrill, Act of 1862 (see Morrill, Justin S.) and from the bequest ($100,000) of Abner Coburn (1803-1885); by appropriations of Congress under the second Morrill Act (1890), and under the Nelson Amendment of 1907, by appropriations of the state legislature, and by fees paid by the students. Connected with the university is an agricultural experiment station, established and maintained under the Hatch Act (1887) and the Adams Act (1906) of the national Congress. The government of the university is entrusted, subject to inspection of the governor and council, to a board of eight trustees. Among the important institutions of learning which have no official connexion with the state are Bowdoin College (opened in 1802), at Brunswick; Colby College (Baptist, opened in 1818), at Waterville; and Bates College (originally Free Baptist but now unsectarian; opened in 1863), at Lewiston. In 1900 5.1% of the state's inhabitants ten years of age and over were illiterate (*i.e.* could neither read nor write, or could read but not write); of the native whites within this age limit 2.4% were illiterate, of the foreign whites, 19.4%. Of the foreign-born whites 15.7% were unable to speak English.

Finance.—The chief sources of the state's revenue are a general property tax and taxes on the franchises of corporations, especially those of railway and insurance companies and savings banks; among the smaller sources are licences or fees, a poll tax, and a collateral inheritance tax. The general property tax for state and local purposes is assessed by local assessors, but their work is reviewed for the purpose of equalization among the several towns and counties by a board of state assessors, which also assesses the corporations. This board of three members (not more than two of whom may be of the same political party) is elected by a joint ballot of

the two houses of the legislature for a term of six years, one member retiring every two years. The state is prohibited by the constitution from creating a debt exceeding $300,000 except for the suppression of a rebellion, for repelling an invasion, or for war purposes; and every city and town is forbidden by an amendment adopted in 1877 from creating one exceeding 5% of the assessed value of its property. But the state was authorized by an amendment adopted in 1868 to issue bonds for the reimbursement of the expenses incurred by its cities, towns, and plantations on account of the Civil War, and these bonds, with those issued by the state itself during the Civil War, constituted the largest part of the state's bonded indebtedness. The bonded debt, however, is rapidly being paid; in January 1901 it was $2,103,000, and in January 1909 only $698,000.

History.—During the 16th century and the early part of the 17th, the coast of Maine attracted various explorers, among them Giovanni da Verrazano (1524), Estéban Gomez (1525), Bartholomew Gosnold (1602), Martin Pring (1603), Pierre du Guast, Sieur De Monts (1604), George Weymouth (1605), and John Smith (1614), who explored and mapped the coast and gave to the country the name New England; but no permanent English settlement was established within what are now the borders of the state until some time between 1623 and 1629. In 1603 De Monts received from Henry IV. of France a charter for all the region between 40° and 46° N. under the name of Acadie, or Acadia, and in 1604 he built a fort on Neutral Island at the mouth of the Saint Croix river. This he abandoned in 1605, but some of his followers were in the vicinity a few years later. In the same year George Weymouth explored the south-west coast, kidnapped five Indians, and carried them to England, where three of them lived for a time in the family of Sir Ferdinando Gorges, who soon became the leader in founding Maine. In 1607 the Plymouth Company, of which he was an influential member and which had received a grant of this region from James I. of England in the preceding year, sent out a colony numbering 120 under George Popham (*c.* 1550-1608), brother of Sir John Popham, and Raleigh Gilbert, son of Sir Humphrey Gilbert. The colony established itself at the mouth of the Kennebec river in August, but, finding its supplies insufficient, about three-fifths of its number returned to England in December; a severe winter followed and Popham died; then Gilbert, who succeeded to the presidency of the council for the colony, became especially interested in his claim to the territory under his father's charter,[6] and in 1608 the colony was abandoned. In 1609 the French Jesuits Biard and Masse established a fortified mission station on the island of Mount Desert, and although this as well as the remnant of De Monts' settlement at the mouth of the Saint Croix was taken in 1613 by Sir Samuel Argall (d. 1626), acting under the instructions of the English at Jamestown, Virginia, some of these colonists returned later. In 1620 the Council for New England, the successor of the Plymouth Company, obtained a grant of the country between latitude 40° and 48° N. extending from sea to sea, and two years later Gorges and John Mason (1586-1635) received from the Council a grant of the territory between the Merrimac and the Kennebec rivers for 60 m. inland under the name of the Province of Maine. In 1629 they divided their possession, Gorges taking the portion between the Piscataqua and the Kennebec. Numerous grants of land in this vicinity followed within a few years; and in the meantime permanent settlements at York, Saco, Biddeford, Port Elizabeth, Falmouth (now Portland) and Scarborough were established in rapid succession. The Council for New England surrendered its charter in 1635. In the division of its territory Gorges retained the portion previously granted to him, and the region between the Kennebec and the Saint Croix north to the Saint Lawrence, though still claimed by the French as part of Acadia, was conveyed to Sir William Alexander (1567?-1640); later, in 1664, this was conveyed to the duke of York, afterwards James II. of England.

Gorges named his tract the County of New Somersetshire, and immediately began the administration of government, setting up in 1635 or 1636 a court at Saco under the direction of his kinsman William Gorges. In 1639 he procured for his province a royal charter modelled after that of Maryland, which invested him with the feudal tenure of a county palatine and vice-regal powers of government. He called into existence a formidably large number of officers to govern it, but his charter was in conflict with the other (mutually conflicting) grants of the Council for New England, east of the Piscataqua; and Gorges and his agents met with a determined opposition under the leadership of George Cleeve, the deputy-president of the Lygonia, or "Plough" Patent, which extended along the coast from Cape Porpoise to Casco, and in issuing which the Council for New England had granted governmental as well as territorial rights. Moreover, Puritan Massachusetts, which was naturally hostile to the Anglicanism of Gorges and his followers, interpreted her charter so as to make her northern boundary run east and west from a point 3 m. north of the source of the Merrimac river, and on this basis laid claim to practically the whole of Maine then settled. The factional quarrels there, together with the Commonwealth government in England, made it easy for Massachusetts to enforce this claim at the time, and between 1652 and 1658 Maine was gradually annexed to Massachusetts. In 1672 Massachusetts extended her boundary eastward as far as Penobscot Bay. Ferdinando Gorges, a grandson of the original proprietor, brought before parliament his claim to Maine and in 1664 a committee of that body decided in his favour; but Massachusetts successfully resisted until 1677, when the king in council decided against her. She then quietly purchased the Gorges claim for £1,250 and held the province as a proprietor until 1691, when by the new Massachusetts charter Maine was extended to the Saint Croix river, and was made an integral part of Massachusetts.

The French still claimed all territory east of the Penobscot, and not only was Maine an exposed frontier and battleground during the long struggle of the English against the Indians and the French, but its citizens bore a conspicuous part in the expeditions beyond its borders. Port Royal was taken in May 1690 by Sir William Phipps and Louisburg in June 1745 by Sir William Pepperell, both these commanders being from Maine. These expeditions were such a drain on Maine's population that Massachusetts was called upon to send men to garrison the little forts that protected the homes left defenceless by men who had gone to the front. During the War of Independence, the town of Falmouth (now Portland), which had ardently resisted the claims of the British, was bombarded and burned, in 1775; in the same year Benedict Arnold followed the course of the Kennebec and Dead rivers on his expedition to Quebec; and from 1779 to 1783 a British force was established at Castine. The embargo and non-intercourse laws from 1807 to 1812 were a severe blow to Maine's shipping, and in the War of 1812 Eastport, Castine, Hampden, Bangor and Machias fell into the hands of the British.

Maine was in general well governed as a part of Massachusetts, but a geographical separation, a desire to be rid of the burden of a large state debt, and a difference of economic interests as well as of politics (Maine was largely Democratic and Massachusetts was largely Federalist) created a desire for an independent

commonwealth. This was felt before the close of the War of Independence and in 1785-1787 conventions were held at Falmouth (Portland) to consider the matter, but the opposition prevailed. The want of protection during the War of 1812 revived the question, and in 1816 the General Court in response to a great number of petitions submitted to a vote in the towns and plantations of the District the question: “Shall the legislature be requested to give its consent to the separation of the District of Maine from Massachusetts, and the erection of said District into a separate state?” The returns showed 10,393 yeas to 6501 nays, but they also showed that less than one-half the full vote had been cast. Acting upon these returns the legislature passed a bill prescribing the terms of separation, and directed another vote of the towns and plantations upon the question of separation and the election of delegates to a convention at Brunswick which should proceed to frame a constitution in case the second popular vote gave a majority of five to four for separation; but as that vote was only 11,969 yeas to 10,347 nays the advocates of separation were unsuccessful. But a large source of opposition to separation was removed in 1819 when Congress, dividing the east coast of the United States into two great districts, did away with the regulation which, making each state a district for entering and clearing vessels, would have required coasting vessels from the ports of Maine as a separate state to enter and clear on every trip to or from Boston; as a consequence, the separation measures were carried by large majorities this year, a constitution was framed by a convention which met at Portland in October, this was ratified by town meetings in December, and Maine applied for admission into the Union. Owing to the peculiar situation at the time in Congress, arising from the contest over the admission of Missouri, the question of the admission of Maine became an important one in national politics. By an Act of the 3rd of March 1820, however, Maine was finally admitted into the Union as a separate state, her admission being a part of the Missouri compromise (*q.v.*).

The boundary on the north had not yet been ascertained, and it had long been a subject of dispute between the United States and Great Britain. The treaty of 1783 (Article II.) had defined the north-east boundary of the United States as extending along the middle of the river St Croix “from its mouth in the bay of Fundy to its source” and “due north from the source of St Croix river to the highlands; along the said highlands which divide those rivers that empty themselves into the river St Lawrence from those which fall into the Atlantic Ocean, to the north-westernmost head of Connecticut river; thence down along the middle of that river to the forty-fifth degree of north latitude.” Great Britain claimed that the due north line was 40 m. long and ran to Mars Hill in Aroostook county, and that the highlands ran thence westerly 115 m. to the source of the Chaudière; the United States, on the other hand, claimed that the northerly line was 140 m. long, running to highlands dividing the Ristigouche and the tributaries of the Metis; and there was a further disagreement with regard to the side of the highlands on which the boundary should be, and as to what stream was the “north-westernmost head of Connecticut river.” The fifth article of the Jay treaty of 1794 provided for a commission to decide what the St Croix river actually was, and this commission in 1798 defined the St Croix, saying that its mouth was in Passamaquoddy bay and that the boundary ran up this river and the Cheputnatecook to a marked monument. The treaty of Ghent in 1814 (Article IV.) referred the question of the ownership of the islands in Passamaquoddy bay to a commission which gave Moose, Dudley and Frederick islands to the United States; and the same treaty by Article V. provided for the survey (which was made in 1817-1818) of a part of the disputed territory, and for a general commission. The general commissioners met at St Andrews, N.B., in 1816, and in New York City in 1822, only to disagree; and when the king of the Netherlands, chosen as arbitrator in 1829 (under the Convention of 1827) rendered in 1831 a decision against which the state of Maine protested, the Federal Senate withheld its assent to his decision. In 1838-1839 the territory in dispute between New Brunswick and Maine became the scene of a border “war,” known as the “Aroostook disturbance”; Maine erected forts along the line she claimed, Congress authorized the president to resist any attempt of Great Britain to enforce exclusive jurisdiction over the disputed territory, and an armed conflict seemed imminent. General Winfield Scott was sent to take command on the Maine frontier, and on the 21st of March 1839 he arranged a truce and a joint occupancy of the territory in dispute until a satisfactory settlement should be reached by the United States and Great Britain. The Webster-Ashburton treaty of 1842 was a compromise, which allowed Maine about 5500 sq. m. less than she had claimed and allowed Great Britain about as much less than her claim; all grants of land previously made by either party within the limits of the territory which by this treaty fell within the dominions of the other party were to be “held valid, ratified and confirmed to the persons in possession under such grants, to the same extent as if such territory had ... fallen within the dominions of the party by whom such grants were made”; and the government of the United States agreed to pay to Maine and Massachusetts[7] “in equal moieties” the sum of $300,000 as compensation for the lands which they had claimed and which under the treaty they were called upon to surrender. The long controversy, which is known in American history as “The North-East boundary dispute,” was not finally settled however until 1910.

It was the Democratic majority in the district of Maine that effected the separation from Massachusetts, and from the date of that separation until 1853 Maine was classed as a Democratic state, although it elected a Whig governor in 1838 and in 1840, and cast its electoral vote for John Quincy Adams in 1824 and 1828 and for W. H. Harrison in 1840. As a result of the slavery question, there was a party disintegration between 1850 and 1855, followed by the supremacy of the Republican party from 1856 to 1878. In 1878, of the 126,169 votes cast in the election for governor, Selden Connor (b. 1839), re-nominated by the Republicans, received 56,554; Joseph L. Smith (“National” or “Greenback”), 41,371; Alonzo Garcelon (1813-1906) (Democratic), 28,218; as no candidate received a majority of the votes, the election was left to the legislature.[8] The vote of the House eliminated Connor, and Garcelon was chosen in the Senate by a Democratic-National fusion. Again there was no election by popular vote in 1879, and Garcelon and his council, to secure the election of a fusion government, counted-in a fusion majority in the legislature by evident falsification of the returns. On the 3rd of January 1880 the Supreme Court declared the governor and council in error in counting in a fusion majority, but on the 7th the governor swore in a legislature with 78 fusion and only two Republican members, and, the governor’s term having expired, the president of the Senate, James D. Lamson, became governor, ex-officio. On the 12th the legislative chambers were seized by the Republicans, whose organized legislature was declared legal by the Supreme Court, and who chose as governor Daniel Franklin Davis (1843-1897); whereupon, on the 17th, Joshua L. Chamberlain, to whom the peaceful solution of the difficulty had largely been due, retired from the task assigned him by Garcelon on the 5th of January “to protect the public property and institutions of the state” until Garcelon’s successor should be duly qualified. In 1880 the Democrats and

Greenbacks united and elected their candidate, but after 1883 Maine was strongly Republican until 1910.

The governors of the state have been as follows:—

William King	Democrat	1820
William Durkee Williamson (acting)	”	1821
Benjamin Ames (acting)	”	1821
Albion Keith Parris	”	1822
Enoch Lincoln	”	1827
Nathan Cutler (acting)	”	1829
Jonathan G. Hunton	”	1830
Samuel Emerson Smith	”	1831
Robert Pinckney Dunlap	”	1834
Edward Kent	Whig	1838
John Fairfield	Democrat	1839
Edward Kent	Whig	1841
John Fairfield	Democrat	1842
Edward Kavanagh (acting)	”	1843
Hugh J. Anderson	”	1844
John Winchester Dana	”	1847
John Hubbard	”	1850
William George Crosby	Whig and Free Soil	1853
Anson Peaslee Morrill	Republican	1855
Samuel Wells	Democrat	1856
Hannibal Hamlin	Republican	1857
Joseph H. Williams (acting)	”	1857
Lot Myrick Morrill	”	1858
Israel Washburn	”	1861
Abner Coburn	”	1863
Samuel Cony	Republican	1864
Joshua Lawrence Chamberlain	”	1867
Sidney Perham	”	1871
Nelson Dingley	”	1874
Selden Connor	”	1876
Alonzo Garcelon	Democrat	1879
Daniel F. Davis	Republican	1880
Harris Merrill Plaisted	Democrat-Greenback	1881
Frederick Robie	Republican	1883
Joseph R. Bodwell	”	1887
Sebastian S. Marble (acting)	”	1887
Edwin C. Burleigh	”	1889
Henry B. Cleaves	”	1893
Llewellyn Powers	”	1897
John Fremont Hill	”	1901
William T. Cobb	”	1905
Bert M. Fernald	”	1909
Frederick W. Plaisted	Democrat	1911

See S. L. Boardman, *Climate, &c., of Maine* (Washington, 1884); Walton Wells, *The Water Power of Maine* (Augusta, 1869); G. H. Hitchcock, *General Report on the Geology of Maine* (Augusta, 1861); G. H. Stone, *The Glacial Gravels of Maine and their Associated Deposits* (Washington, 1899); T. Nelson Dale, *The Granites of Maine* (Washington, 1907), being Bulletin 313 of the U. S. Geological Survey; B. F. De Costa, *Sketches of the Coast of Maine and Isle of Shoals* (New York, 1869); H. D. Thoreau, *The Maine Woods* (Boston, 1881); L. L. Hubbard, *Woods and Lakes of Maine* (Boston, 1883); T. S. Steele, *Canoe and Camera, a Two Hundred Mile Tour through the Maine Forests* (New York, 1882); William MacDonald, *The Government of Maine, Its History and Administration* (New York, 1902); *Maine Historical Society Collections* (Portland, 1831-); W. D. Williamson, *History of the State of Maine* (Hallowell, 1832); J. P. Baxter, *Sir Ferdinando Gorges and his Province of Maine* (Boston, 1890) and *George Cleeve of Casco Bay* (Portland, 1885); George Folsom, *History of Saco and Biddeford, with notices of other Early Settlements and of the Proprietary Governments in Maine* (Saco, 1830); J. L. Chamberlain, *Maine, Her Place in History* (Augusta, 1877); E. S. Whitin, *Factory Legislation in Maine* (New York, 1908).

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1 This condition results from the fact that Maine and the adjacent region were worn down nearly to sea-level by stream erosion, except certain peaks and ridges inland; then the region was elevated and numerous river valleys were cut down below the general erosion surface formed before. Thus we have a general “upland surface,” above which the mountain remnants tower, and below which the rivers have been entrenched.

2 This name is applied to a chain of lakes (the Rangeley, or Oquossoc, the Cupsuptic, the Mooselookmeguntic, the Molechunkamunk or Upper Richardson, the Welokenebacook or Lower Richardson, and the Umbagog) in Franklin and Oxford counties, in the western part of the state; the Umbagog extends into New Hampshire and its outlet helps to form the Androscoggin River. These lakes are connected by straits, have a total area of between 80 and 90 sq. m., and are from 1200 to 1500 ft. above the sea. They are sometimes called the Androscoggin Lakes.

3 The census of 1905 was taken under the direction of the United States census bureau, but the statistics for hand trades were omitted.

4 According to previous censuses the population was as follows: (1790) 96,540; (1800) 151,719; (1810) 228,705; (1820) 298,335; (1830) 399,455; (1840) 501,793; (1850) 583,169; (1860) 628,279; (1870) 626,915.

5 An unincorporated township containing less than 200 inhabitants may, on the application of three resident voters, be organized as a plantation, but does not pay state or county taxes unless by special legislative order. Other unincorporated districts, especially islands along the coast, are called “grants,” “surpluses,” “gores” or “tracts.”

6 By this charter, issued in 1578, Sir Humphrey Gilbert was entitled to all territory lying within two hundred leagues of any colony that he might plant within six years; although it had long since lapsed, Raleigh Gilbert seems not to have been aware of it.

7 An article in the Act relating to the separation of Maine from Massachusetts stipulated that the lands within the District of Maine which prior to the separation had belonged to Massachusetts should after the separation belong one-half to Maine and one-half to Massachusetts. In 1826 the wild lands of Maine were surveyed and divided between the two states; and in 1853 Maine acquired from Massachusetts, for $362,500, all of this land still remaining in possession of the latter state.

8 According to Art. V. of the constitution a majority of the total number of votes cast was required for election; in case no candidate should receive a majority, it was prescribed that the "House of Representatives shall, by ballot, from the persons having the four highest numbers of votes on the lists, if so many there be, elect two persons and make returns of their names to the Senate, of whom the Senate shall, by ballot, elect one, who shall be declared the governor." An amendment, which became a part of the constitution on the 9th of November 1880, provided that a plurality of the total number of votes cast should be sufficient for election.

MAINE DE BIRAN, FRANÇOIS-PIERRE-GONTHIER

(1766-1824), French philosopher, was born at Bergerac, on the 29th of November, 1766. The name Maine he assumed (some time before 1787) from an estate called Le Maine, near Mouleydier. After studying with distinction under the *doctrinaires* of Périgueux, he entered the life-guards of Louis XVI., and was present at Versailles on the memorable 5th and 6th of October 1789. On the breaking up of the *gardes du corps* Biran retired to his patrimonial inheritance of Grateloup, near Bergerac, where his retired life preserved him from the horrors of the Revolution. It was at this period that, to use his own words, he "passed *per saltum* from frivolity to philosophy." He began with psychology, which he made the study of his life. After the Reign of Terror Maine de Biran took part in political affairs. Having been excluded from the council of the Five Hundred on suspicion of royalism, he took part with his friend Laîné in the commission of 1813, which gave expression for the first time to direct opposition to the will of the emperor. After the Restoration he held the office of treasurer to the chamber of deputies, and habitually retired during the autumn recess to his native district to pursue his favourite study. He died on the 20th (16th, or 23rd, according to others) of July 1824.

Maine de Biran's philosophical reputation has suffered from two causes—his obscure and laboured style, and the fact that only a few, and these the least characteristic, of his writings appeared during his lifetime. These consisted of the essay on habit (*Sur l'influence de l'habitude*, 1803), a critical review of P. Laromiguière's lectures (1817), and the philosophical portion of the article "Leibnitz" in the *Biographie universelle* (1819). A treatise on the analysis of thought (*Sur la décomposition de la pensée*), although sent to press, was never printed. In 1834 these writings, together with the essay entitled *Nouvelles considérations sur les rapports du physique et du moral de l'homme*, were published by Victor Cousin, who in 1841 added three volumes, under the title *Œuvres philosophiques de Maine de Biran*. But the publication (in 1859) by E. Naville (from MSS. placed at his father's disposal by Biran's son) of the *Œuvres inédites de Maine de Biran*, in three volumes, first rendered possible a connected view of his philosophical development. At first a sensualist, like Condillac and Locke, next an intellectualist, he finally shows himself a mystical theosophist. The *Essai sur les fondements de la psychologie* represents the second or completest stage of his philosophy, the fragments of the *Nouveaux essais d'anthropologie* the third.

Maine de Biran's first essays in philosophy were written avowedly from the point of view of Locke and Condillac, but even in them he was brought to signalize the essential fact on which his later speculation turns. Dealing with the formation of habits, he is compelled to note that passive impressions, however transformed, do not furnish a complete or adequate explanation. With Laromiguière he distinguishes attention as an active effort, of no less importance than the passive receptivity of sense, and with Butler distinguishes passively formed customs from active habits. He finally arrived at the conclusion that Condillac's notion of passive receptivity as the one source of conscious experience was not only an error in fact but an error of method—in short, that the mechanical mode of viewing consciousness as formed by external influence was fallacious and deceptive. For it he proposed to substitute the genetic method, whereby human conscious experience might be exhibited as growing or developing from its essential basis in connexion with external conditions. The essential basis he finds in the real consciousness, of self as an active striving power, and the stages of its development, corresponding to what one may call the relative importance of the external conditions and the reflective clearness of self-consciousness he designates as the affective, the perceptive and the reflective. In connexion with this Biran treats most of the obscure problems which arise in dealing with conscious experience, such as the mode by which the organism is cognized, the mode by which the organism is distinguished from extra-organic things, and the nature of those general ideas by which the relations of things are known to us—cause, power, force, &c.

In the latest stage of his speculation Biran distinguishes the animal existence from the human, under which the three forms above noted are classed, and both from the life of the spirit, in which human thought is brought into relation with the supersensible, divine system of things. This stage is left imperfect. Altogether Biran's work presents a very remarkable specimen of deep metaphysical thinking directed by preference to the psychological aspect of experience.

The *Œuvres inédites* of Maine de Biran by E. Naville contain an introductory study; in 1887 appeared *Science et psychologie: nouvelles œuvres inédites*, with introduction by A. Bertrand. See also O. Merton, *Étude critique sur Maine de Biran* (1865); E. Naville, *Maine de Biran, sa vie et ses pensées* (1874); J. Gérard, *Maine de Biran, essai sur sa philosophie* (1876); Mayonade, *Pensées et pages inédites de Maine de Biran* (Périgueux, 1896); G. Allievo, "Maine de Biran e la sua dottrina antropologica" (Turin, 1896, in *Memorie dell' accademia delle scienze*, 2nd ser., xlv, pt. 2); A. Lang, *Maine de Biran und die neuere Philosophie* (Cologne, 1901);

monographs by A. Kühtmann (Bremen, 1901) and M. Couailhac (1905); N. E. Truman in *Cornell Studies in Philosophy*, No. 5 (1904) on Maine de Biran's Philosophy of Will.

MAINE-ET-LOIRE, a department of western France, formed in 1790 for the most part out of the southern portion of the former province of Anjou, and bounded N. by the departments of Mayenne and Sarthe, E. by Indre-et-Loire, S.E. by Vienne, S. by Deux-Sèvres and Vendée, W. by Loire-Inférieure, and N.W. by Ille-et-Vilaine. Area, 2786 sq. m. Pop. (1906), 513,490. Maine-et-Loire is made up of two distinct regions, the line of demarcation running roughly from north to south along the valley of the Sarthe, then turning south-west and passing Brissac and Doué; that to the west consists of granites, felspars, and a continuation of the geological formations of Brittany and Vendée; to the east, schists, limestone and chalk prevail. The department is traversed from east to west by the majestic valley of the Loire, with its rich orchards, nurseries and market-gardens. The highest altitudes are found in the south-west, where north-east of Cholet one eminence reaches 689 ft. Elsewhere the surface is low and undulating in character. The department belongs entirely to the basin of the Loire, the bed of which is wide but shallow, and full of islands, the depth of the water in summer being at some places little more than 2 ft. Floods are sudden and destructive. The chief affluent of the Loire within the department is the Maine, formed a little above Angers by the junction of the Mayenne and the Sarthe, the latter having previously received the waters of the Loire. All three are navigable. Other tributaries of the Loire are the Thouet (with its tributary the Dive), the Layon, the Evre, and the Divatte on the left, and the Authion on the right. The Mayenne is joined on the right by the Oudon, which can be navigated below Segré. The Erdre, which joins the Loire at Nantes, and the Moine, a tributary of the Sèvre-Nantaise, both rise within this department. The climate is very mild. The mean annual temperature of Angers is about 53°, slightly exceeding that of Paris; the rainfall (between 23 and 24 in. annually) is distinctly lower than that of the rest of France. Notwithstanding this deficiency, the frequent fogs, combined with the peculiar nature of the soil in the south-east of the department, produce a degree of moisture which is highly favourable to meadow growths. The winter colds are never severe, and readily permit the cultivation of certain trees which cannot be reared in the adjoining departments.

The agriculture of the department is very prosperous. The produce of cereals, chiefly wheat, oats and barley, is in excess of its needs, and potatoes and mangels also give good returns. Extensive areas in the valley of the Loire are under hemp, and the vegetables, melons and other fruits of that region are of the finest quality. Good wine is produced at Serrant and other places near Angers, and on the right bank of the Layon and near Saumur, the sparkling white wine of which is a rival of the cheaper brands of champagne. Cider is also produced, and the cultivation of fruit is general. Forests and woodland in which oak and beech are the chief trees cover large tracts. The fattening of cattle is an important industry round Cholet, and horses much used for light cavalry are reared. Several thousand workmen are employed in the slate quarries in the vicinity of Angers, tufa is worked in the river valleys, and freestone and other stone, mispickel, iron and coal are also found. Cholet, the chief industrial town, and its district manufacture pocket-handkerchiefs, as well as linen cloths, flannels, cotton goods, and hempen and other coarse fabrics, and similar industries are carried on at Angers, which also manufactures liqueurs, rope, boots and shoes and parasols. Saumur, besides its production of wine, makes beads and enamels. The commerce of Maine-et-Loire comprises the exportation of live stock and of the various products of its soil and industries, and the importation of hemp, cotton, and other raw materials. The department is served by the railways of the state and the Orléans and Western companies. The Mayenne, the Sarthe and the Loir, together with some of the lesser rivers, provide about 130 m. of navigable waterway. In the south-east the canal of the Dive covers some 10 m. in the department.

There are five arrondissements—Angers, Baugé, Cholet, Saumur and Segré, with 34 cantons and 381 communes. Maine-et-Loire belongs to the académie (educational division) of Rennes, to the region of the VIII. army corps, and to the ecclesiastical province of Tours. Angers (*q.v.*), the capital, is the seat of a bishopric and of a court of appeal. Other principal places are Cholet, Saumur, and Fontevrault, which receive separate treatment. For architectural interest there may also be mentioned the châteaux of Brissac (17th century), Serrant (15th and 16th centuries), Montreuil-Bellay (14th and 15th centuries), and Ecuillé (15th century), and the churches of Puy-Notre-Dame (13th century) and St Florent-le-Vieil (13th, 17th, and 19th centuries), the last containing the fine monument to Charles Bonchamps, the Vendean leader, by David d'Angers. Gennes has remains of a theatre and other ruins of the Roman period, as well as two churches dating in part from the 10th century. Ponts-de-Cé, an interesting old town built partly on islands in the Loire, is historically important, because till the Revolution its bridges formed the only way across the Loire between Saumur and Nantes.

MAINPURI, or Mynpooree, a town and district of British India, in the Agra division of the United Provinces. The town has a station on a branch of the East Indian railway recently opened from Shikohabad. Pop. (1901), 19,000. It consists of two separate portions, Mainpuri proper and Mukhamganj. Holkar plundered and burned part of the town in 1804, but was repulsed by the local militia. Since the British occupation the population has rapidly increased and many improvements have been carried out. The Agra branch of the Grand Trunk road runs through the town, forming a wide street lined on both sides by shops, which constitute the principal bazaar. Mainpuri has a speciality in the production of carved wooden articles inlaid with brass

wire. The American Presbyterian mission manages a high school.

The District of Mainpuri lies in the central Doab. Area, 1675 sq. m. Pop. (1901), 829,357, an increase of 8.8% in the decade. It consists of an almost unbroken plain, intersected by small rivers, with a few undulating sand ridges. It is wooded throughout with mango groves, and isolated clumps of *bábul* trees occasionally relieve the bareness of its saline *usar* plains. On the south-western boundary the Jumna flows in a deep alluvial bed, sometimes sweeping close to the high banks which overhang its valley, and elsewhere leaving room for a narrow strip of fertile soil between the river and the upland plain. From the low-lying lands thus formed a belt of ravines stretches inland for some 2 m., often covered with jungle, but affording good pasturage for cattle. The district is watered by two branches of the Ganges canal, and is traversed by the main line of the East Indian railway.

Mainpuri anciently formed part of the great kingdom of Kanauj, and after the fall of that famous state it was divided into a number of petty principalities, of which Rapri and Bhongaon were the chief. In 1194 Rapri was made the seat of a Moslem governor. Mainpuri fell to the Moguls on Baber's invasion in 1526, and, although temporarily wrested from them by the short-lived Afghan dynasty of Shere Shah, was again occupied by them on the reinstatement of Humayun after the victory of Panipat. Like the rest of the lower Doab, Mainpuri passed, towards the end of the 18th century, into the power of the Mahrattas, and finally became a portion of the province of Oudh. When this part of the country was ceded to the British, in 1801, Mainpuri town became the headquarters of the extensive district of Etawah, which was in 1856 reduced by the formation of Etah and Mainpuri into separate collectorates. On the outbreak of the Mutiny in 1857 the regiment stationed at Mainpuri revolted and attacked the town, which was successfully defended by the few Europeans of the station for a week, until the arrival of the Jhansi mutineers made it necessary to abandon the district.

MAINTENANCE

(Fr. *maintenance*, from *maintenir*, to maintain, support, Lat. *manu tenere*, to hold in the hand). The action of giving support, supplying means of subsistence, keeping efficient or in working order. In English law maintenance is an officious intermeddling in an action that in no way belongs to one by maintaining or assisting either party, with money or otherwise, to prosecute or defend it. It is an indictable offence, both at common law and by statute, and punishable by fine and imprisonment. It invalidates all contracts involving it. It is also actionable. There are, however, certain cases in which maintenance is justifiable, *e.g.* any one who has an interest, even if it be only contingent, in the matter at variance can maintain another in an action concerning the matter; or several parties who have a common interest in the same thing may maintain one another in a suit concerning the same. Neither is it reckoned maintenance to assist another in his suit on charitable grounds, or for a master to assist his servant, or a parent his son, or a husband his wife. The law with regard to the subject is considered at length in *Bradlaugh* v. *Newdegate*, 1883, 11 Q.B.D. 1. See also Champerty. For the practice of "livery and maintenance" see English History, §§ v. and vi.

A cap of maintenance, *i.e.* a cap of crimson velvet turned up with ermine, is borne, as one of the insignia of the British sovereign, immediately before him at his coronation or on such state occasions as the opening of parliament. It is carried by the hereditary bearer, the marquess of Winchester, upon a white wand. A similar cap is also borne before the lord mayor of London. The origin of this symbol of dignity is obscure. It is stated in the *New English Dictionary* that it was granted by the pope to Henry VII. and Henry VIII. It is probably connected with the "cap of estate" or "dignity," sometimes also styled "cap of maintenance," similar to the royal symbol with two peaks or horns behind, which is borne as a heraldic charge by certain families. It seems originally to have been a privilege of dukes. Where it is used the crest is placed upon it, instead of on the usual wreath.

MAINTENON, FRANÇOISE D'AUBIGNÉ, Marquise de

(1635-1719), the second wife of Louis XIV., was born in a prison at Niort, on the 27th of November 1635. Her father, Constant d'Aubigné, was the son of Agrippa d'Aubigné, the famous friend and general of Henry IV., and had been imprisoned as a Huguenot malcontent, but her mother, a fervent Catholic, had the child baptized in her religion, her sponsors being the duc de la Rochefoucauld, father of the author of the *Maxims*, and the comtesse de Neuillant. In 1639 Constant d'Aubigné was released from prison and took all his family with him to Martinique, where he died in 1645, after having lost what fortune remained to him at cards. Mme d'Aubigné returned to France, and from sheer poverty unwillingly yielded her daughter to her sister-in-law, Mme de Villette, who made the child very happy, but converted or pretended to convert her to Protestantism. When this was known an order of state was issued that she should be entrusted to Mme de Neuillant, her godmother. Every means was now used to convert her back to Catholicism, but at the last she only yielded on the condition that she need not believe that the soul of Mme de Villette was lost. Once reconverted, she was neglected and sent home to live with her mother, who had only a small pension of 200 livres a year, which ceased on her death in 1650. The chevalier de Meré, a man of some literary distinction, who had made her acquaintance at Mme de Neuillant's, discovered her penniless condition, and introduced his "young Indian," as he called her, to Scarron, the famous wit and comic writer, at whose house all the literary society of the day assembled. Scarron took a fancy to the friendless girl, and offered either to pay for her admission to a convent, or, though he was deformed and an invalid, to marry her himself. She accepted his offer of marriage, and became Mme Scarron

in 1651. For nine years she was not only his most faithful nurse, but an attraction to his house, where she tried to bridle the licence of the conversation of the time. On the death of Scarron, in 1660, Anne of Austria continued his pension to his widow, and even increased it to 2000 livres a year, which enabled her to entertain and frequent the literary society her husband had made her acquainted with; but on the queen-mother's death in 1666 the king refused to continue her pension, and she prepared to leave Paris for Lisbon as lady attendant to the queen of Portugal. But before she started she met Mme de Montespan, who was already, though not avowedly, the king's mistress, and who took such a fancy to her that she obtained the continuance of her pension, which put off for ever the question of going to Portugal. Mme de Montespan did yet more for her, for when, in 1669, her first child by the king was born, Mme Scarron was established with a large income and a large staff of servants at Vaugirard to bring up the king's children in secrecy as they were born. In 1674 the king determined to have his children at court, and their governess, who had now made sufficient fortune to buy the estate of Maintenon, accompanied them. The king had now many opportunities of seeing Mme Scarron, and, though at first he was prejudiced against her, her even temper contrasted so advantageously with the storms of passion and jealousy exhibited by Mme de Montespan, that she grew steadily in his favour, and had in 1678 the gratification of having her estate at Maintenon raised to a marquisate and herself entitled Mme de Maintenon by the king. Such favours brought down the fury of Mme de Montespan's jealousy, and Mme de Maintenon's position was almost unendurable, until, in 1680, the king severed their connexion by making the latter second lady in waiting to the dauphiness, and soon after Mme de Montespan left the court. The new *amie* used her influence on the side of decency, and the queen openly declared she had never been so well treated as at this time, and eventually died in Mme de Maintenon's arms in 1683. The queen's death opened the way to yet greater advancement; in 1684 Mme de Maintenon was made first lady in waiting to the dauphiness, and in the winter of 1685-1686 she was privately married to the king by Harlay, archbishop of Paris, in the presence, it is believed, of Père la Chaise, the king's confessor, the marquis de Montchevreuil, the chevalier de Forbin, and Bontemps. No written proof of the marriage is extant, but that it took place is nevertheless certain. Her life during the next thirty years can be fully studied in her letters, of which many authentic examples are extant. As a wife she was wholly admirable; she had to entertain a man who would not be amused, and had to submit to that terribly strict court etiquette of absolute obedience to the king's inclination, which Saint-Simon so vividly describes, and yet be always cheerful and never complain of weariness or ill-health. Her political influence has probably been exaggerated, but it was supreme in matters of detail. The ministers of the day used to discuss and arrange all the business to be done with the king beforehand with her, and it was all done in her cabinet and in her presence, but the king in more important matters often chose not to consult her. Such mistakes as, for instance, the replacing of Catinat by Villeroi may be attributed to her, but not whole policies—notably, according to Saint-Simon, not the policy with regard to the Spanish succession. Even the revocation of the edict of Nantes and the dragonnades have been laid to her charge, but recent investigations have tended to show that in spite of ardent Catholicism, she at least opposed, if not very vigorously, the cruelties of the dragonnades, although she was pleased with the conversions they procured. She was apparently afraid to imperil her great reputation for devotion, which had in 1692 obtained for her from Innocent XII. the right of visitation over all the convents in France. Where she deserves blame is in her use of her power for personal patronage, as in compassing the promotions of Chamillart and Villeroi, and the frequent assistance given to her brother Comte Charles d'Aubigné. Her influence was on the whole a moderating and prudent force. Her social influence was not as great as it might have been, owing to her holding no recognized position at court, but it was always exercised on the side of decency and morality, and it must not be forgotten that from her former life she was intimate with the literary people of the day. Side by side with this public life, which wearied her with its shadowy power, occasionally crossed by a desire to be recognised as queen, she passed a nobler and sweeter private existence as the foundress of St Cyr. Mme de Maintenon was a born teacher; she had so won the hearts of her first pupils that they preferred her to their own mother, and was similarly successful later with the young and impetuous duchess of Burgundy, and she had always wished to establish a home for poor girls of good family placed in such straits as she herself had experienced. As soon as her fortunes began to mend she started a small home for poor girls at Ruel, which she afterwards moved to Noisy, and which was the nucleus of the splendid institution of St Cyr, which the king endowed in 1686, at her request, out of the funds of the Abbey of St Denis. She was in her element there. She herself drew up the rules of the institution; she examined every minute detail; she befriended her pupils in every way; and her heart often turned from the weariness of Versailles or of Marly to her "little girls" at St Cyr. It was for them that Racine wrote his *Esther* and his *Athalie*, and it was because he managed the affairs of St Cyr well that Michel Chamillart became controller-general of the finances. The later years of her power were marked by the promotion of her old pupils, the children of the king and Mme de Montespan, to high dignity between the blood royal and the peers of the realm, and it was doubtless under the influence of her dislike for the duke of Orleans that the king drew up his will, leaving the personal care of his successor to the duke of Maine, and hampering the duke of Orleans by a council of regency. On or even before her husband's death she retired to St Cyr, and had the chagrin of seeing all her plans for the advancement of the duke of Maine overthrown by means of the parliament of Paris. However, the regent Orleans in no way molested her, but, on the contrary, visited her at St Cyr and continued her pension of 48,000 livres. She spent her last years at St Cyr in perfect seclusion, but an object of great interest to all visitors to France, who, however, with the exception of Peter the Great, found it impossible to get an audience with her. On the 15th of April 1719 she died, and was buried in the choir at St Cyr, bequeathing her estate at Maintenon to her niece, the only daughter of her brother Charles and wife of the maréchal de Noailles, to whose family it still belongs.

L. A. la Beaumelle published the *Lettres de Madame de Maintenon*, but much garbled, in 2 vols. in 1752, and on a larger scale in 9 vols. in 1756. He also, in 1755, published *Mémoires de Madame de Maintenon*, in 6 vols., which caused him to be imprisoned in the Bastille. All earlier biographies were superseded by Théophile Lavallée's *Histoire de St Cyr*, reviewed in *Causeries du lundi*, vol. viii., and by his edition of her *Lettres historiques et édifiantes*, &c., in 7 vols. and of her *Correspondance générale*, in 4 vols. (1888), which latter must, however, be read with the knowledge of many forged letters, noticed in P. Grimblot's *Faux autographes de Madame de Maintenon*. Saint-Simon's fine but biased account of the court in her day and of her career is contained in the twelfth volume of Chéruel and Regnier's edition of his *Mémoires*. See also Mademoiselle d'Aumale's *Souvenirs sur Madame de Maintenon*, published by the Comte d'Haussonville and G. Hanotaux (Paris, 3 vols., 1902-1904); an excellent account by A. Geffroy, *Madame de Maintenon d'après sa*

correspondance authentique (Paris, 2 vols., 1887); P. de Noailles, *Histoire de Madame de Maintenon et des principaux évènements du règne de Louis XIV.* (4 vols., 1848-1858); A. de Boislisle, *Paul Scarron et Françoise d'Aubigné d'après des documents nouveaux* (1894); É. Pilastre, *Vie et caractère de Madame de Maintenon d'après les œuvres du duc de Saint-Simon et des documents anciens ou récents* (1907); A. Rosset, *Madame de Maintenon et la révocation de l'édit de Nantes* (1897).

(H. M. S.)

MAINZ (Fr. Mayence) a city, episcopal see and fortress of Germany, situated on the left bank of the Rhine, almost opposite the influx of the Main, at the junction of the important main lines of railway from Cologne to Mannheim and Frankfort-on-Main, 25 m. W. of the latter. Pop. (1905), 91,124 (including a garrison of 7500 men), of whom two-thirds are Roman Catholic. The Rhine, which here attains the greatest breadth of its upper course, is crossed by a magnificent bridge of five arches, leading to the opposite town of Castel and by two railway bridges. The old fortifications have recently been pushed farther back, and their place occupied by pleasant boulevards. The river front has been converted into a fine promenade, commanding extensive views of the Taunus range of mountains, and the "Rheingau," the most favoured wine district of Germany. Alongside the quay are the landing-places of the steamboats navigating the Rhine. The railway, which formerly incommoded the bank, has been diverted, and now, following the ceinture of the new line of inner fortifications, runs into a central station lying to the south of the city. The interior of the old town consists chiefly of narrow and irregular streets, with many quaint and picturesque houses. The principal street of the new town is the Kaiserstrasse, leading from the railway station to the river.

The first object of historical and architectural interest in Mainz is the grand old cathedral, an imposing Romanesque edifice with numerous Gothic additions and details (for plan, &c. see ARCHITECTURE: *Romanesque and Gothic in Germany*). It was originally erected between 975 and 1009, but has since been repeatedly burned down and rebuilt, and in its present form dates chiefly from the 12th, 13th and 14th centuries. The largest of its six towers is 300 ft. high. The whole building was restored by order of Napoleon in 1814, and another thorough renovation was made more recently. The interior contains the tombs of Boniface, the first archbishop of Mainz, of Frauenlob, the Minnesinger, and of many of the electors. Mainz possesses nine other Roman Catholic churches, the most noteworthy of which are those of St Ignatius, with a finely painted ceiling, of St Stephen, built 1257-1328, and restored after an explosion in 1857, and of St Peter. The old electoral palace (1627-1678), a large building of red sandstone, now contains a valuable collection of Roman and Germanic antiquities, a picture gallery, a natural history museum, the Gutenberg Museum, and a library of 220,000 volumes. Among the other principal buildings are the palace of the grand duke of Hesse, built in 1731-1739 as a lodge of the Teutonic order, the theatre, the arsenal, and the government buildings. A handsome statue of Gutenberg, by Thorwaldsen, was erected at Mainz in 1837. Mainz still retains many relics of the Roman period, the most important of which is the Eigelstein, a monument believed to have been erected by the Roman legions in honour of Drusus. It stands within the citadel, which occupies the site of the Roman castrum. A little to the south-west of the town are the remains of a large Roman aqueduct, of which upwards of sixty pillars are still standing. The educational and scientific institutions of Mainz include an episcopal seminary, two gymnasia and other schools, a society for literature and art, a musical society, and an antiquarian society. The university, founded in 1477, was suppressed by the French in 1798.

The site of Mainz would seem to mark it out naturally as a great centre of trade, but the illiberal rule of the archbishops and its military importance seriously hampered its commercial and industrial development, and prevented it from rivalling its neighbour Frankfort. It is now, however, the chief emporium of the Rhenish wine traffic, and also carries on an extensive transit trade in grain, timber, flour, petroleum, paper and vegetables. The natural facilities for carriage by water are supplemented by the extensive railway system. Large new harbours to the north of the city were opened in 1887. The principal manufactures are leather goods, furniture, carriages, chemicals, musical instruments and carpets, for the first two of which the city has attained a wide reputation. Other industries include brewing and printing. Mainz is the seat of the administrative and judicial authorities of the province of Rhein-Hessen, and also of a Roman Catholic bishop.

History.—Mainz, one of the oldest cities in Germany, was originally a Celtic settlement. Its strategic importance was early recognized by the Romans, and about 13 B.C. Drusus, the son-in-law of Augustus, erected a fortified camp here, to which the *castellum Mattiacorum* (the modern Castel) on the opposite bank was afterwards added, the two being connected with a bridge at the opening of the Christian era. The Celtic name became latinized as *Maguntiacum*, or *Moguntiacum*, and a town gradually arose around the camp, which became the capital of Germania Superior. During the Völkerwanderung Mainz suffered severely, being destroyed on different occasions by the Alamanni, the Vandals and the Huns. Christianity seems to have been introduced into the town at a very early period, and in the 6th century a new Mainz was founded by Bishop Sidonius. In the middle of the 8th century under Boniface it became an archbishopric, and to this the primacy of Germany was soon annexed. Charlemagne, who had a palace in the neighbourhood, gave privileges to Mainz, which rose rapidly in wealth and importance, becoming a free city in 1118. During the later middle ages it was the seat of several diets, that of 1184 being of unusual size and splendour. In 1160 the citizens revolted against Archbishop Arnold, and in 1163 the walls of the city were pulled down by order of the emperor Frederick I. But these events did not retard its progress. In 1244 certain rights of self-government were given to the citizens; and in 1254 Mainz was the centre and mainspring of a powerful league of Rhenish towns. Owing to its commercial prosperity it was known as *goldene* Mainz, and its population is believed to have been as great as it is at the present day. But soon a decline set in. In 1462 there was warfare between two rival archbishops, Diether or Dietrich II. of Isenburg (d. 1463) and Adolph II. of Nassau (d. 1475). The citizens espoused the cause of Diether, but their city was captured by Adolph; it was then deprived of its privileges and was made subject to the archbishop. Many of the inhabitants were driven into exile, and these

carried into other lands a knowledge of the art of printing, which had been invented at Mainz by Johann Gutenberg in 1450. During the Thirty Years' War Mainz was occupied by the Swedes in 1631 and by the French in 1644, the fortifications being strengthened by the former under Gustavus Adolphus; in 1688 it was captured again by the French, but they were driven out in the following year. In 1792 the citizens welcomed the ideas of the French Revolution; they expelled their archbishop, Friedrich Karl Joseph d'Erthal, and opened their gates to the French troops. Taken and retaken several times during the next few years, Mainz was ceded to France by the treaty of Campo Formio in 1797, and again by the Treaty of Lunéville in 1801. In 1814 it was restored to Germany and in 1816 it was handed over to the grand duke of Hesse; it remained, however, a fortress of the German confederation and was garrisoned by Prussian and Austrian troops. Since 1871 it has been a fortress of the German Empire. There were disturbances in the city in 1848.

See Brühl, *Mainz, geschichtlich, topographisch und malerisch* (Mainz, 1829); C. A. Schaab, *Geschichte der Stadt Mainz* (Mainz, 1841-1845); K. Klein, *Mainz und seine Umgebungen* (1868); C. G. Bockenheimer, *Beiträge zur Geschichte der Stadt Mainz* (1874); Neeb, *Führer durch Mainz und Umgebung* (Stuttgart, 1903); and O. Beck, *Mainz und sein Handel* (Mainz, 1881).

The Archbishopric of Mainz, one of the seven electorates of the Holy Roman Empire, became a powerful state during the middle ages and retained some of its importance until the dissolution of the empire in 1806. Its archbishop was president of the electoral college, arch-chancellor of the empire and primate of Germany. Its origin dates back to 747, when the city of Mainz was made the seat of an archbishop, and a succession of able and ambitious prelates, obtaining lands and privileges from emperors and others, made of the district under their rule a strong and vigorous state. Among these men were Hatto I. (d. 913), Siegfried III. of Eppstein (d. 1249), Gerhard of Eppstein (d. 1305), and Albert of Brandenburg (d. 1545), all of whom played important parts in the history of Germany. There were several violent contests between rivals anxious to secure so splendid a position as the electorate, and the pretensions of the archbishops occasionally moved the citizens of Mainz to revolt. The lands of the electorate lay around Mainz, and were on both banks of the Rhine; their area at the time of the French Revolution was about 3200 sq. m. The last elector was Karl Theodor von Dalberg. The archbishopric was secularized in 1803, two years after the lands on the left bank of the Rhine had been seized by France. Some of those on the right bank of the river were given to Prussia and to Hesse; others were formed into a grand duchy for Dalberg. The archbishopric itself was transferred to Regensburg.

For the history of the electorate see the *Scriptores rerum moguntiacarum*, edited by G. C. Joannis (Frankfort, 1722-1727); Schunk, *Beiträge zur Mainzer Geschichte* (Frankfort, 1788-1791); Hennes, *Die Erzbischöfe von Mainz* (Mainz, 1879); Ph. Jaffé, *Monumenta moguntina* (Berlin, 1866), and J. F. Böhmer and C. Will, *Regesta archiepiscoporum moguntinensium* (Innsbruck, 1877-1886).

MAIRET, JEAN DE

(1604-1686), French dramatist, was born at Besançon, and baptized on the 10th of May 1604. His own statement that he was born in 1610 has been disproved. He went to Paris to study at the Collège des Grassins about 1625, in which year he produced his first piece *Chriséide et Arimand*, followed in 1626 by *Sylvie*, a "pastoral tragi-comedy." In 1634 appeared his masterpiece, *Sophonisbe*, which marks, in its observance of the rules, the beginning of the "regular" tragedies. Mairet was one of the bitterest assailants of Corneille in the controversy over *The Cid*. It was perhaps his jealousy of Corneille that made him give up writing for the stage. He was appointed in 1648 official representative of the Franche-Comté in Paris, but in 1653 he was banished by Mazarin. He was subsequently allowed to return, but in 1668 he retired to Besançon, where he died on the 31st of January 1686. His other plays include *Silvanire ou la Morte-vive*, published in 1631 with an elaborate preface on the observance of the unities, *Les Galanteries du duc d'Orsonne* (1632), *Virginie* (1633), *Marc-Antoine* (1635), and *Le Grand et dernier Solyman* (1637).

See G. Bizos, *Étude sur la vie et les œuvres de Jean de Mairet* (1877). *Sophonisbe* was edited by K. Vollmöller (Heilbronn, 1888), and *Silvanire* by R. Otto (Bamberg, 1890).

MAISTRE, JOSEPH DE

(1754-1821), French diplomatist and polemical writer, was born at Chambéry on the 1st of April 1754. His family was an ancient and noble one, enjoying the title of count, and is said to have been of Languedocian extraction. The father of Joseph was president of the senate of Savoy, and held other important offices. Joseph himself, after studying at Turin, received various appointments in the civil service of Savoy, finally becoming a member of the senate. In 1786 he married Françoise de Morand. The invasion and annexation of Savoy by the French Republicans made him an exile. He did not take refuge in that part of the king of Sardinia's domains which was for the time spared, but betook himself to the as yet neutral territory of Lausanne. There, in 1796, he published his first important work (he had previously written certain discourses, pamphlets, letters, &c.), *Considérations sur la France*. In this he developed his views, which were those of a Legitimist, but a Legitimist entirely from the religious and Roman Catholic point of view. The philosophism of the 18th century was Joseph de Maistre's lifelong object of assault.

After the still further losses which, in the year of the publication of this book, the French Revolution inflicted on Sardinia, Charles Emmanuel summoned Joseph de Maistre to Turin, and he remained there for the brief space during which the king retained a remnant of territory on the mainland. Then he went to the island of

Sardinia, and held office at Cagliari. In 1802 he was appointed envoy extraordinary and minister plenipotentiary at St Petersburg, and journeyed thither the next year. Although his post was no sinecure, its duties were naturally less engrossing than the official life, with intervals of uneasy exile and travelling, which he had hitherto known, and his literary activity was great. He only published a single treatise, on the *Principe générateur des Constitutions*; but he wrote his best and most famous works, *Du Pape*, *De L'église gallicane* and the *Soirées de St Pétersbourg*, the last of which was never finished. *Du Pape*, which the second-named book completes, is a treatise in regular form, dealing with the relations of the sovereign pontiff to the Church, to temporal sovereigns, to civilization generally, and to schismatics, especially Anglicans and the Greek Church. It is written from the highest possible standpoint of papal absolutism. The *Soirées de St Pétersbourg*, so far as it is anything (for the arrangement is somewhat desultory), is a kind of *théodicée*, dealing with the fortunes of virtue and vice in this world. It contains two of De Maistre's most famous pieces, his panegyric on the executioner as the foundation of social order, and his acrimonious, and in part unfair, but also in part very damaging, attack on Locke. The *Du Pape* is dated May 1817; on the *Soirées* the author was still engaged at his death. Besides these works he wrote an examination of the philosophy of Bacon, some letters on the Inquisition (an institution which, as may be guessed from the remarks just noticed about the executioner, was no stumbling-block to him), and, earlier than any of these, a translation of Plutarch's "Essay on the Delay of Divine Justice," with somewhat copious notes. After 1815 he returned to Savoy, and was appointed to high office, while his *Du Pape* made a great sensation. But the world to which he had returned was not altogether in accordance with his desires. He had domestic troubles; and chagrin of one sort and another is said to have had not a little to do with his death by paralysis on the 26th of February 1821 at Turin. Most of the works mentioned were not published till after his death, and it was not till 1851 that a collection of *Lettres et opuscules* appeared, while even since that time fresh matter has been published.

Joseph de Maistre was one of the most powerful, and by far the ablest, of the leaders of the neo-Catholic and anti-revolutionary movement. The most remarkable thing about his standpoint is that, layman as he was, it was entirely ecclesiastical. Unlike his contemporary Bonald, Joseph de Maistre regarded the temporal monarchy as an institution of altogether inferior importance to the spiritual primacy of the pope. He was by no means a political absolutist, except in so far as he regarded obedience as the first of political virtues, and he seldom loses an opportunity of stipulating for a tempered monarchy. But the pope's power is not to be tempered at all, either by councils or by the temporal power or by national churches, least of all by private judgment. The peculiarity of Joseph de Maistre is that he supports his conclusions, or if it be preferred his paradoxes, by the hardest and heaviest argument. Although a great master of rhetoric, he never makes rhetoric do duty for logic. Every now and then it is possible to detect fallacies in him, but for the most part he has succeeded in carrying matters back to those fundamental differences of opinion which hardly admit of argument, and on which men take sides in consequence chiefly of natural bent, and of predilection for one state of things rather than for another. The absolute necessity of order may be said to have been the first principle of this thinker, who, in more ways than one, will invite comparison with Hobbes. He could not conceive such order without a single visible authority, reference to which should settle all dispute. He saw that there could be no such temporal head, and in the pope he thought that he saw a spiritual substitute. The anarchic tendencies of the Revolution in politics and religion were what offended him. It ought to be added that he was profoundly and accurately learned in history and philosophy, and that the superficial blunders of the 18th-century *philosophes* irritated him as much as their doctrines. To Voltaire in particular he shows no mercy.

Of the two works named as his masterpieces, *Du Pape* and the *Soirées de St Pétersbourg*, editions are extremely numerous. No complete edition of his works appeared till 1884-1887, when one was published at Lyons in 14 volumes. This had been preceded, and has been followed, by numerous biographies and discussions: C. Barthélemy, *L'Esprit de Joseph de Maistre* (1859); R. de Sézeval, *Joseph de Maistre* (1865), and J. C. Glaser, *Graf Joseph Maistre* (same year); L. I. Moreau, *Joseph de Maistre* (1879); F. Paulhan, *Joseph de Maistre et sa philosophie* (1893); L. Cogordan, "Joseph de Maistre" in the *Grands écrivains français* (1894); F. Descostes, *Joseph de Maistre avant la révolution* (1896), and other works by the same writer; J. Mandoul, *Un Homme d'état italien: Joseph de Maistre et la politique de la maison de Savoie* (1900); and E. Grasset, *Joseph de Maistre* (1901).

(G. Sa.)

MAISTRE, XAVIER DE (1763-1852), younger brother of Joseph de Maistre, was born at Chambéry in October 1763. He served when young in the Piedmontese army, and wrote his delightful fantasy, *Voyage autour de ma chambre* (published 1794) when he was under arrest at Turin in consequence of a duel. Xavier shared the politics and the loyalty of his brother, and on the annexation of Savoy to France, he left the service, and took a commission in the Russian army. He served under Suvarov in his victorious Austro-Russian campaign and accompanied the marshal to Russia. He shared the disgrace of his general, and supported himself for some time in St Petersburg by miniature painting. But on his brother's arrival in St Petersburg he was introduced to the minister of marine. He was appointed to several posts in the capital, but also saw active service, was wounded in the Caucasus, and attained the rank of major-general. He married a Russian lady and established himself in his adopted country, even after the overthrow of Napoleon, and the consequent restoration of the Piedmontese dynasty. For a time, however, he lived at Naples, but he returned to St Petersburg and died there on the 12th of June 1852. He was only once in Paris (in 1839), when Sainte-Beuve, who has left some pleasant reminiscences of him, met him. Besides the *Voyage* already mentioned, Xavier de Maistre's works (all of which are of very modest dimensions) are *Le Lépreux de la cité d'Aoste* (1811), a touching little story of human misfortune; *Les Prisonniers du Caucase*, a powerful sketch of Russian character, *La Jeune Sibérienne*, and the *Expédition nocturne*, a sequel to the *Voyage autour de ma chambre* (1825). His style is of remarkable ease and purity.

His works, with the exception of some brief chemical tractates, are included in the collections of Charpentier, Garnier, &c. See Sainte-Beuve's *Portraits contemporains*, vol. iii.

MAITLAND, EDWARD (1824-1897), English humanitarian writer, was born at Ipswich on the 27th of October 1824, and was educated at Caius College, Cambridge. The son of Charles David Maitland, perpetual curate of St James's Chapel, Brighton, he was intended for the Church, but his religious views did not permit him to take holy orders. For some years he lived abroad, first in California and then as a commissioner of Crownlands in Australia. After his return to England in 1857 he took up an advanced humanitarian position, and claimed to have acquired a new sense by which he was able to discern the spiritual condition of other people. He was associated with Mrs Anna Kingsford (1846-1888), the lady-doctor and supporter of vegetarianism and anti-vivisectionism, who, besides being one of the pioneers of higher education for women, had become a devotee of mystical theosophy; with her he brought out *Keys of the Creeds* (1875), *The Perfect Way: or the Finding of Christ* (1882), and founded the Hermetic Society in 1884. After her death he founded the Esoteric Christian Union in 1891, and wrote her *Life and Letters* (1896). He died on the 2nd of October 1897.

MAITLAND, FREDERIC WILLIAM (1850-1906), English jurist and historian, son of John Gorham Maitland, was born on the 28th of May 1850, and educated at Eton and Trinity, Cambridge, being bracketed at the head of the moral sciences tripos of 1872, and winning a Whewell scholarship for international law. He was called to the bar (Lincoln's Inn) in 1876, and made himself a thoroughly competent equity lawyer and conveyancer, but finally devoted himself to comparative jurisprudence and especially the history of English law. In 1884 he was appointed reader in English law at Cambridge, and in 1888 became Downing professor of the laws of England. Though handicapped in his later years by delicate health, his intellectual grasp and wide knowledge and research gradually made him famous as a jurist and historian. He edited numerous volumes for the Selden Society, including *Select Pleas for the Crown, 1200-1225*, *Select Pleas in Manorial Courts* and *The Court Baron*; and among his principal works were *Gloucester Pleas* (1884), *Justice and Police* (1885), *Bracton's Note-Book* (1887), *History of English Law* (with Sir F. Pollock, 1895; new ed. 1898; see also his article ENGLISH LAW in this encyclopaedia), *Domesday Book and Beyond* (1897), *Township and Borough* (1898), *Canon Law in England* (1898), *English Law and the Renaissance* (1901), the *Life of Leslie Stephen* (1906), besides important contributions to the *Cambridge Modern History*, the *English Historical Review*, the *Law Quarterly Review*, *Harvard Law Review* and other publications. His writings are marked by vigour and vitality of style, as well as by the highest qualities of the historian who recreates the past from the original sources; he had no sympathy with either legal or historical pedantry; and his death at Grand Canary on the 19th of December 1906 deprived English law and letters of one of their most scholarly and most inspiring representatives, notable alike for sweetness of character, acuteness in criticism, and wisdom in counsel.

See P. Vinogradoff's article on Maitland in the *English Historical Review* (1907); Sir F. Pollock's in the *Quarterly Review* (1907); G. T. Lapsley's in *The Green Bag* (Boston, Mass., 1907); A. L. Smith, *F. W. Maitland* (1908); H. A. L. Fisher, *F. W. Maitland* (1910).

MAITLAND, SIR RICHARD (LORD LETHINGTON) (1496-1586), Scottish lawyer, poet, and collector of Scottish verse, was born in 1496. His father, Sir William Maitland of Lethington and Thirlestane, fell at Flodden; his mother was a daughter of George, Lord Seton. He studied law at the university of St Andrews, and afterwards in Paris. His castle at Lethington was burnt by the English in 1549. He was in 1552 one of the commissioners to settle matters with the English about the debateable lands. About 1561 he seems to have lost his sight, but this did not render him incapable of attending to public business, as he was the same year admitted an ordinary lord of session with the title of Lord Lethington, and a member of the privy council; and in 1562 he was appointed keeper of the Great Seal. He resigned this last office in 1567, in favour of John, prior of Coldingham, his second son, but he sat on the bench till he attained his eighty-eighth year. He died on the 20th of March 1586. His eldest son, by his wife Mary Cranstoun of Crosbie, was William Maitland (*q.v.*): his second son, John (*c.* 1545-1595), was a lord of session, and was made a lord of parliament in 1590, with the title of Lord Maitland of Thirlestane, in which he was succeeded by his son John, also for some time a lord of session, who was created earl of Lauderdale in 1624. One of Sir Richard's daughters, Margaret, assisted her father in preparing his collection of old Scots verse.

The poems of Sir Richard Maitland, none of them lengthy, are for the most part satirical, and are principally directed against the social and political abuses of his time. He is chiefly remembered as the industrial

collector and preserver of many pieces of Scots poetry. These were copied into two large volumes, one in folio and another in quarto, the former written by himself, and the latter by his daughter. After being in the possession of his descendant the duke of Lauderdale, these volumes were purchased at the sale of the duke's library by Samuel Pepys, and have since been preserved in the Pepysian Library, Magdalene College, Cambridge. They lay there unnoticed for many years till Bishop Percy published one of the poems in his *Reliques of English Poetry*. Several of the prices were then transcribed by John Pinkerton, who afterwards published them under the title of *Ancient Scottish Poems* (2 vols., 1786.)

For an account of the Maitland Folio MS. see Gregory Smith's *Specimens of Middle Scots*, 1902 (p. lxxiii.). The Scottish Text Society has undertaken an edition of the entire manuscript. Maitland's own poems were reprinted by Sibbald in his *Chronicle of Scottish Poetry* (1802), and in 1830 by the Maitland Club, named after him, and founded for the purpose of continuing his efforts to preserve the remains of early Scots literature. Sir Richard left in manuscript a history of the family of Seton, and a volume of legal decisions collected by him between the years 1550 and 1565. Both are preserved in the Advocates' Library, Edinburgh; the former was published by the Maitland Club, in 1829.

MAITLAND (Maitland of Lethington), WILLIAM (*c.* 1528-1573), Scottish statesman, eldest son of the preceding, was educated at St Andrews. At an early age he entered public life and began in various ways to serve the regent, Mary of Lorraine, becoming her secretary of state in 1558. In 1559, however, he deserted her and threw in his lot with the lords of the congregation, to whom his knowledge of foreign, and especially of English, politics and his general ability were assets of the highest value. The lords sent him to England to ask for assistance from Elizabeth, and his constant aim throughout his political career was to bring about a union between the two crowns. He appears to have feared the return of Mary Queen of Scots to Scotland, but after her arrival in 1561 he was appointed secretary of state, and for about six years he directed the policy of Scotland and enjoyed the confidence of the queen. His principal antagonist was John Knox; there were several tussles between them, the most famous, perhaps, being the one in the general assembly of 1564, and on the whole Maitland held his own against the preachers. He was doubtless concerned in the conspiracy against David Rizzio, and after the favourite's murder he was obliged to leave the court and was himself in danger of assassination. In 1567, however, he was again at Mary's side. He was a consenting party to the murder of Darnley, although he had favoured his marriage with Mary, but the enmity between Bothwell and himself was one of the reasons which drove him into the arms of the queen's enemies, among whom he figured at Langside. He was one of the Scots who met Elizabeth's representatives at York in 1568; here he showed a desire to exculpate Mary and to marry her to the duke of Norfolk, a course of action probably dictated by a desire to avoid all revelations about the Darnley murder. But this did not prevent him from being arrested in September 1569 on account of his share in the crime. He was, however, delivered from his captors by a ruse on the part of his friend, Sir William Kirkcaldy of Grange, and was brought into Edinburgh Castle, while his trial was put off because the city was thronged with his adherents. Maitland now became the leader of the remnant which stood by the cause of the imprisoned queen. Already a physical wreck, he was borne into Edinburgh Castle in April 1571 and with Kirkcaldy he held this fortress against the regent Morton and his English auxiliaries. The castle surrendered in May 1573 and on the 7th or the 9th of June following Maitland died at Leith, there being very little evidence for the theory that he poisoned himself. "Secretary Maitland" was a man of great learning with a ready wit and a caustic tongue. He was reputed to be the most versatile and accomplished statesman of his age, and almost alone among his Scottish contemporaries he placed his country above the claims of either the Roman Catholic or the Protestant religions. Among the testimonies to his great abilities are those of Queen Elizabeth, of William Cecil and of Knox. By his second wife, Mary Fleming, one of Queen Mary's ladies, whom he married in 1567, he had a son and daughter. His son James died without issue about 1620.

See John Skelton, *Maitland of Lethington* (1894); A. Lang, *History of Scotland*, vol. ii. (1902).

MAITLAND, EAST and WEST, adjoining municipalities in Northumberland county, New South Wales, Australia, 120 m. by rail N. of Sydney. Pop. (1901), West Maitland, 6798; East Maitland, 3287. These towns are situated in a valley on the Hunter River, which is liable to sudden floods, to guard against which the river is protected by stone embankments at West Maitland, while there are flood-gates at East Maitland. Maitland is the centre of the rich agricultural district of the Hunter Valley, which produces maize, wheat and other cereals, lucerne, tobacco, fruit and wine; excellent coal also is worked in the vicinity. East Maitland is the see of a Roman Catholic bishop, whose cathedral (St John's), however, is situated in the larger town. Besides this, West Maitland contains several handsome public and commercial buildings.

MAITREYA, the name of the future Buddha. In one of the works included in the Pali canon, the *Dīgha Nikāya*, a prophecy is put into the Buddha's mouth that after the decay of the religion another Buddha, named Metteyya, will arise who will have thousands of followers instead of the hundreds that the historical Buddha had. This is the only mention of the future Buddha in the canon. For some centuries we hear nothing more about him. But when, in the period just before and after the Christian era, some Buddhists began to write in Sanskrit instead of Pali, they composed new works in which Maitreya (the Sanskrit form of Metteyya) is more often mentioned, and details are given as to his birthplace and history. These are entirely devised in imitation of the details of the life of the historical Buddha, and have no independent value. Only the names differ. The document in which the original prophecy occurs was put together at some date during the 1st century after the Buddha's death (see NIKĀYA). It is impossible to say whether tradition was, at that time, correct in attributing it to the Buddha. But whoever chose the name (it is a patronymic or family, not a personal name), had no doubt regard to the etymological connexion with the word for "love," which is Mettā in Pali. This would only be one of those punning allusions so frequent in Indian literature.

Long afterwards, probably in the 6th or 7th century, a reformer in south India, at a time when the incoming flood of ritualism and superstition threatened to overwhelm the simple teaching of the earlier Buddhism, wrote a Pali poem, entitled the *Anāgata Vaṃsa*. In this he described the golden age of the future when, in the time of Metteyya, kings, ministers and people would vie one with the other in the maintenance of the original simple doctrine, and in the restoration of the good times of old. The other side also claimed the authority of the future Buddha for their innovations. Statues of Maitreya are found in Buddhist temples, of all sects, at the present day; and the belief in his future advent is universal among Buddhists.

Authorities.—*Dīgha Nikāya*, vol. iii., edited by J. E. Carpenter, (London, 1908); "*Anāgata Vaṃsa*," edited by J. Minayeff in *Journal of the Pali Text Society* (1886); *Watters on Yuan Chwang*, edited by Rhys Davids and S. W. Bushell (London, 1904-1905).

(T. W. R. D.)

MAIWAND, a village of Afghanistan, 50 m. N.W. of Kandahar. It is chiefly notable for the defeat inflicted on a British brigade under General Burrows by Ayub Khan on the 27th of July 1880 during the second Afghan War (see AFGHANISTAN). Ayub Khan, Shere Ali's younger son, who had been holding Herat during the British operations at Kabul and Kandahar, set out towards Kandahar with a small army in June 1880, and a brigade under General Burrows was detached from Kandahar to oppose him. Burrows advanced to the Helmund, opposite Girishk, to oppose Ayub Khan, but was there deserted by the troops of Shere Ali, the wali of Kandahar, and forced to retreat to Kushk-i-Nakhud, half way to Kandahar. In order to prevent Ayub passing to Ghazni, Burrows advanced to Maiwand on the 27th of July, and attacked Ayub, who had already seized that place. The Afghans, who numbered 25,000, outflanked the British, the artillery expended their ammunition, and the native portion of the Brigade got out of hand and pressed back on the few British infantry. The British were completely routed, and had to thank the apathy of the Afghans for escaping total annihilation. Of the 2476 British troops engaged, 934 were killed and 175 wounded or missing. This defeat necessitated Sir Frederick Roberts' famous march from Kabul to Kandahar.

See Lord Roberts, *Forty-one Years in India* (1896).

MAIZE, or INDIAN CORN, *Zea Mays* (from ζεά or ζειά, which appears to have been "spelt," *Triticum spelta*, according to the description of Theophrastus), a plant of the tribe Maydeae of the order Gramineae or grasses (see fig. 1). It is unknown in the native state, but is most probably indigenous to tropical America. Small grains of an unknown variety have been found in the ancient tombs of Peru, and Darwin found heads of maize embedded on the shore in Peru at 85 ft. above the present sea-level. Bonafous, however (*Histoire naturelle du maïs*), quotes authorities (Bock, 1532, Ruel and Fuchs) as believing that it came from Asia, and maize was said by Santa Rosa de Viterbo to have been brought by the Arabs into Spain in the 13th century. A drawing of maize is also given by Bonafous from a Chinese work on natural history, *Li-chi-tchin*, dated 1562, a little over sixty years after the discovery of the New World. It is not figured on Egyptian monuments, nor was any mention made of it by Eastern travellers in Africa or Asia prior to the 16th century. Humboldt, Alphonse de Candolle and others, however, do not hesitate to say that it originated solely in America, where it had been long and extensively cultivated at the period of the discovery of the New World; and that is the generally accepted modern view. Some hold the view that maize originated from a common Mexican fodder grass, *Euchlaena mexicana*, known as Teosinte, a closely allied plant

which when crossed with maize yields a maize-like hybrid.

FIG. 1.

Maize—*Zea Mays*—unripe cob. The membranous spathes have been cut and drawn aside, revealing the spike of fruit which bears the long silky styles. One-third nat. size.

The plant is monoecious, producing the staminate (male) flowers in a large feathery panicle at the summit, and the (female) dense spikes of flowers, or "cobs," in the axils of the leaves below, the long pink styles hanging out like a silken tassel. They are invested by the sheaths of leaves, much used in packing oranges in south Europe, and the more delicate ones for cigarettes in South America. Fig. 2 shows a branch of the terminal male inflorescence. Fig. 3 is a single spikelet of the same, containing two florets, with the three stamens of one only protruded. Fig. 4 is a spike of the female inflorescence, protected by the sheaths of leaves—the blades being also present. Usually the sheaths terminate in a point, the blades being arrested. Fig. 5 is a spikelet of the female inflorescence, consisting of two outer glumes, the lower one ciliated, which enclose two florets—one (*a*) barren (sometimes fertile), consisting of a flowering glume and pale only, and the other (*b*) fertile, containing the pistil with elongated style. The mass of styles from the whole spike is pendulous from the summit of the sheaths, as in fig. 4. Fig. 6 shows the fruit or grain. More than three hundred varieties are known, which differ more among themselves than those of any other cereal. Some come to maturity in two months, others require seven months; some are as many feet high as others are inches; some have kernels eleven times larger than others. They vary similarly in shape and size of ears, colour of the grain, which may be white, yellow, purple, striped, &c., and also in physical characters and chemical composition. Dr E. Lewis Sturtevant, who has made an extended study of the forms and varieties, classes into seven groups those grown primarily for the grain, the distinguishing characters of which are based on the grains or kernels; there are, in addition, forms of horticultural interest grown for ornament. Pod corn (var. *tunicata*) is characterized by having each kernel enclosed in a husk. Pop corn (var. *everta*) has a very large proportion of the "endosperm"—the nutritious matter which with the small embryo makes up the grain—of a horny consistency, which causes the grain to pop when heated, that is to say, the kernel becomes turned inside out by the explosion of the contained moisture. It is also characterized by the small size of the grain and ear. Flint corn (var. *indurata*) has a starchy endosperm enclosed in a horny layer of varying thickness in the different varieties. The colour of the grain is white, yellow, red, blue or variegated. It is commonly cultivated in Canada and northern United States, where the seasons are too short for Dent corn, and has been grown as far north as 50° N. lat. Dent or field corn (var. *indentata*) has the starchy endosperm extending to the summit of the grain, with horny endosperm at the sides. The top of the grain becomes indented, owing to the drying and shrinkage of the starchy matter; the character of the indented surface varies with the height and thickness of the horny endosperm. This is the form commonly grown in the United States; the varieties differ widely in the size of the plants and the appearance of the ear.

FIG. 2.—Spike of Male Flowers.

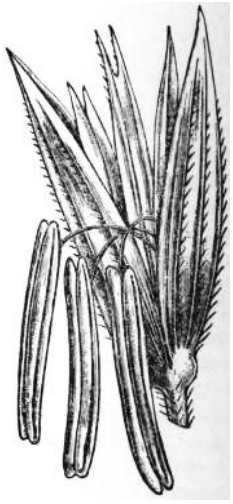

FIG. 3.—Male Spikelet.

Fig. 4.—Female Spike.

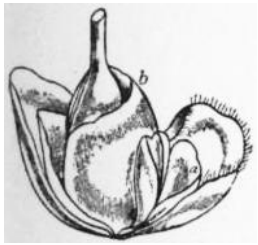

Fig. 5.—Female Spikelet.

The colour of the grain varies greatly, being generally white, yellow, mottled red, or less commonly red. Soft corn (var. *amylacea*) has no horny endosperm, and hence the grains shrink uniformly. It is cultivated only to a limited extent in the United States, but seems to have been commonly grown by the Indians in many localities in North and South America. Sweet corn (var. *saccharata*) is characterized by the translucent horny appearance of the grains and their more or less wrinkled condition. It is pre-eminently a garden vegetable, the ear being used before the grain hardens, when it is well filled but soft and milky. It is often cooked and served in the cob; when canned it is cut from the cob. Canned sweet corn is an important article of domestic commerce in Canada and the United States. In starchy sweet corn (var. *amylea-saccharata*) the grain has the external appearance of sweet corn, but examination shows the lower half to be starchy, the upper horny and translucent. A form of flint corn, with variegated leaves, is grown for ornament under the name *Zea japonica* or Japanese striped corn.

Fig. 6.—Grain.

Chemical analysis, like common experience, shows that Indian corn is a very nutritious article of food, being richer in albuminoids than any other cereals when ripe (calculated in the dry weight). It can be grown in the tropics from the level of the sea to a height equal to that of the Pyrenees and in the south and middle of Europe, but it cannot be grown in England with any chance of profit, except perhaps as fodder. Frost kills the plant in all its stages and all its varieties; and the crop does not flourish well if the nights are cool, no matter how favourable the other conditions. Consequently it is the first crop to disappear as one ascends into the mountain regions, and comparatively little is grown west of the great plains of North America. In Brittany, where it scarcely ripens the grain, it furnishes a strong crop in the autumn upon sandy soil where clover and lucerne will yield but a poor produce. It prefers a deep, rich, warm, dry and mellow soil, and hence the rich bottoms and fertile prairies of the Mississippi basin constitute the region of its greatest production. It is extensively grown throughout India, both for the ripe grain and for use of the unripe cob as a green vegetable. It is the most common crop throughout South Africa, where it is known as mealies, being the staple food of the natives. It is also largely used for fodder and is an important article of export.

As an article of food maize is one of the most extensively used grains in the world. Although rich in nitrogenous matter and fat, it does not make good bread. A mixture of rye and corn meal, however, makes an excellent coarse bread, formerly much used in the Atlantic states, and a similar bread is now the chief coarse bread of Portugal and some parts of Spain. It is either baked into cakes, called *tortilla* by the Indians of Yucatan, or made into a kind of porridge, as in Ireland. When deprived of the gluten it constitutes oswego, maizena or corn flour. Maize contains more oil than any other cereal, ranging from 3.5 to 9.5% in the commercial grain. This is one of the factors in its value for fattening purposes. In distilling and some other processes this oil is separated and forms an article of commerce. When maize is sown, broadcast or closely planted in drills the ears may not develop at all, but the stalk is richer in sugar and sweeter; and this is the basis of growing “corn-fodder.” The amount of forage that may be produced in this way is enormous; 50,000 to 80,000 ℔ of green fodder are grown per acre, which makes 8000 to 12,000 ℔ as field-cured. Sugar and molasses have from time to time been manufactured from the corn stalks.

See articles on corn and *Zea Mays* in L. H. Bailey’s *Cyclopaedia of American Horticulture* (1900-1902); and for cultivation in India, Watt’s *Dictionary of the Economic Products of India*, vi. (1893).

MAJESTY (Fr. *majesté*; Lat. *majestas*, grandeur, greatness, from the base *mag-*, as in *magnus*, great, *major*, greater, &c.), dignity, greatness, a term especially used to express the dignity and power of a sovereign. This application is to be traced to the use of *majestas* in Latin to express the supreme sovereign dignity of the Roman state, the *majestas reipublicae* or *populi Romani*, hence *majestatem laedere* or *minuere*, was to commit high treason, *crimen majestatis*. (For the modern law and usage of *laesa majestas, lèse majesté, Majestätsbeleidigung*, see Treason.) From the republic *majestas* was transferred to the emperors, and the *majestas populi Romani* became the *majestas imperii*, and *augustalis majestas* is used as a term to express

the sovereign person of the emperor. Honorius and Theodosius speak of themselves in the first person as *nostra majestas*. The term "majesty" was strictly confined in the middle ages to the successors of the Roman emperors in the West, and at the treaty of Cambrai (1529) it is reserved for the emperor Charles V. Later the word is used of kings also, and the distinction is made between imperial majesty (*caesareana majestas*) and kingly or royal majesty. From the 16th century dates the application of "Most Christian and Catholic Majesty" to the kings of France, of "Catholic Majesty" to the kings of Spain, of "Most Faithful Majesty" to the kings of Portugal, and "Apostolic Majesty" to the kings of Hungary. In England the use is generally assigned to the reign of Henry VIII., but it is found, though not in general usage, earlier; thus the *New English Dictionary* quotes from an *Address of the Kings Clerks to Henry II.* in 1171 (Materials for the History of Archbishop Becket, vii. 471, Rolls Series, 1885), where the king is styled *vestra majestas*, and Selden (*Titles of Honour*, part i. ch. 7, p. 98, ed. 1672) finds many early uses in letters to Edward I., in charters of creation of peers, &c. The fullest form in English usage is "His Most Gracious Majesty"; another form is "The King's Most Excellent Majesty," as in the English Prayer-book. "His Sacred Majesty" was common in the 17th century; and of this form Selden says: "It is true, I think, that in our memory or the memory of our fathers, the use of it first began in England." "His Majesty," abbreviated H.M., is now the universal European use in speaking of any reigning king, and "His Imperial Majesty," H.I.M., of any reigning emperor.

From the particular and very early use of "majesty" for the glory and splendour of God, the term has been used in ecclesiastical art of the representation of God the Father enthroned in glory, sometimes with the other persons of the Trinity, and of the Saviour alone, enthroned with an aureole.

MAJLÁTH, JÁNOS, or John, Count (1786-1855), Hungarian historian and poet, was born at Pest on the 5th of October 1786. First educated at home, he subsequently studied philosophy at Eger (Erlau) and law at Györ (Raab), his father, Count Joseph Majláth, an Austrian minister of state, eventually obtaining for him an appointment in the public service. Majláth devoted himself to historical research and the translation into German of Magyar folk-tales, and of selections from the works of the best of his country's native poets. Moreover, as an original lyrical writer, and as an editor and adapter of old German poems, Majláth showed considerable talent. During the greater part of his life he resided either at Pest or Vienna, but a few years before his death he removed to Munich, where he fell into a state of destitution and extreme despondency. Seized at last by a terrible infatuation, he and his daughter Henriette, who had long been his constant companion and amanuensis, drowned themselves in the Lake of Starnberg, a few miles south-west of Munich, on the 3rd of January 1855.

Of his historical works the most important are the *Geschichte der Magyaren* (Vienna, 1828-1831, 5 vols.; 2nd ed., Ratisbon, 1852-1853) and his *Geschichte des österreichischen Kaiserstaats* (Hamburg, 1834-1850, 5 vols.). Specially noteworthy among his metrical translations from the Hungarian are the *Magyarische Gedichte* (Stuttgart and Tübingen, 1825); and *Himfy's auserlesene Liebeslieder* (Pest, 1829; 2nd ed., 1831). A valuable contribution to folk-lore appeared in the *Magyarische Sagen, Märchen und Erzählungen* (Brünn, 1825; 2nd ed., Stuttgart and Tübingen, 1837, 2 vols.).

MAJOLICA, a name properly applied to a species of Italian ware in which the body is coated with a tin-enamel, on which is laid and fired a painted decoration. It is also applied to similar wares made in imitation of the Italian ware in other countries. The word in Italian is *maiolica*. Du Cange (*Gloss. s.v.* "Majorica") quotes from a chronicle of Verona of 1368, in which the form *majolica* occurs for the more usual Latin form *majorica*. It has usually been supposed that this type of pottery was first made in the island of Majorca, but it is more probable that the name was given by the Italians to the lustred Spanish ware imported by ships hailing from the Balearic Islands. (See Ceramics: *Medieval and Later Italian*.)

MAJOR (or Mair), JOHN (1470-1550), Scottish theological and historical writer, was born at the village of Gleghornie, near North Berwick, Scotland, in the year 1470. He was educated at the school of Haddington, where John Knox was later a pupil. After a short period spent at Cambridge (at God's House, afterwards Christ's College) he entered the university of Paris in 1493, studying successively at the colleges of St Barbe, Montaigu and Navarre, and graduating as master of arts in 1496. Promoted to the doctorate in 1505, he lectured on philosophy at Montaigu College and on theology at Navarre. He visited Scotland in 1515 and returned in 1518, when he was appointed principal regent in the university of Glasgow, John Knox being among the number of those who attended his lectures there. In 1522 he removed to St Andrew's University, where in 1525 George Buchanan was one of his pupils. He returned to the college of Montaigu in 1525, but

was once more at St Andrew's in 1531, where he was head of St Salvator's College from 1534 until his death.

Major's voluminous writings may be grouped under (*a*) logic and philosophy, (*b*) Scripture commentary, and (*c*) history. All are in Latin, all appeared between 1503 and 1530, and all were printed at Paris. The first group includes his *Exponabilia* (1503), his commentary on Petrus Hispanus (1505-1506), his *Inclitarum artium libri* (1506, &c.), his commentary on Joannes Dorp (1504, &c.), his *Insolubilia* (1516, &c.), his introduction to Aristotle's logic (1521, &c.), his commentary on the ethics (1530), and, chief of all, his commentary on Peter Lombard's *Sentences* (1509, &c.); the second consists of a commentary on Matthew (1518) and another on the Four Gospels (1529); the last is represented by his famous *Historia Majoris Britanniae tam Angliae quam Scotiae per J. M.* (1521). In political philosophy he maintained the Scotist position, that civil authority was derived from the popular will, but in theology he was a scholastic conservative, though he never failed to show his approbation of Gallicanism and its plea for the reform of ecclesiastical abuses. He has left on record that it was his aim and hope to reconcile realism and nominalism in the interests of theological peace. He had a world-wide reputation as a teacher and writer. Buchanan's severe epigram, perhaps the only unfriendly words in the flood of contemporary praise, may be explained as a protest against the compromise which Major appeared to offer rather than as a personal attack on his teacher. Major takes a more independent attitude in his *History*, which is a remarkable example of historical accuracy and insight. He claims that the historian's chief duty is to write truthfully, and he is careful to show that a theologian may fulfil this condition.

The *History*, on which his fame now rests, was reprinted by Freebairn (Edinburgh, 1740), and was translated in 1892 by Archibald Constable for the Scottish History Society. The latter volume contains a full account of the author by Aeneas J. G. Mackay and a bibliography by Thomas Graves Law.

MAJOR (Lat. for "greater"), a word used, both as a substantive and adjective, for that which is greater than another in size, quality, degree, importance, &c., often opposed correlatively to that to which "minor" is applied in the same connotation. In the categorical syllogism in logic, the major term is the term which forms the predicate of the conclusion, the major premise is that which contains the major term. (For the distinction between major and minor intervals, and other applications in music, see MUSIC and HARMONY.)

The use of *Major* as part of an official title in Med. Lat. has given the Span. *mayor*, Fr. *maire*, and Eng. "*mayor*" (*q.v.*). In English the unadapted form "major" is the title of a military officer now ranking between a captain and a lieutenant-colonel. Originally the word was used adjectivally in the title "sergeant-major," an officer of high rank (third in command of an army) who performed the same duties of administration, drill and encampments on the staff of the chief commander as the sergeant in a company performs as assistant to the captain. This was in the latter half of the 16th century, and very soon afterwards the "sergeant-major" became known as the "sergeant-major-general"—hence the modern title of major-general. By the time of the English Civil War "majors" had been introduced in each regiment of foot, who corresponded in a lesser sphere to the "major-general" of the whole army. The major's sphere of duties, precedence and title have since varied but little, though he has, in the British service, taken the place of the lieutenant-colonel as second in command—the latter officer exercising the command of the cavalry regiment, infantry battalion or artillery brigade, and the colonel being, save for certain administrative functions, little more than the titular chief of his regiment. Junior majors command companies of infantry; squadrons of cavalry and batteries of artillery are also commanded by majors. In most European armies, however, and of late years in the army of the United States also, the major has become a battalion commander under the orders of a regimental commander (colonel or lieutenant-colonel). The word appears also in the British service in "brigade-major" (the adjutant or staff officer of a brigade). "Town-majors" (garrison staff officers) are now no longer appointed. In the French service up to 1871 the "major-general" was the chief of the general staff of a field army, and thus preserved the tradition of the former "sergeant-major" or "sergeant-major-general."

MAJORCA (*Mallorca*), the largest of the group of Spanish islands in the Mediterranean Sea known as the Balearic Islands (*q.v.*). Pop. (1900), 248,191; area, 430 sq. m. Majorca has the shape of a trapezoid, with the angles directed to the cardinal points; and its diagonal, from Cape Grozer in the west to Cape Pera in the east, is about 60 m. On the north-west the coast is precipitous, but on the other sides it is low and sloping. On the north-east there are several considerable bays, of which the chief are those of Alcudia and Pollensa; while on the south-west is the still more important bay of Palma. No fewer than twelve ports or harbours are enumerated round the island, of which may be mentioned Andraitx and Sóller. In the north-west Majorca is traversed by a chain of mountains running parallel with the coast, and attaining its highest elevation in Silla de Torrellas (5154 ft.). Towards the south and east the surface is comparatively level, though broken by isolated peaks of considerable height. The northern mountains afford great protection to the rest of the island from the violent gales to which it would otherwise be exposed, and render the climate remarkably mild and pleasant. The scenery of Majorca has all the picturesqueness of outline that usually belongs to a limestone formation. Some of the valleys, such as those of Valdemosa and Sóller, with their luxuriant vegetation, are delightful resorts. There are quarries of marble of various grains and colours—those near Santañy, in the district of Manacor, being especially celebrated; while lead, iron and cinnabar have also been obtained. Coal of a jet-like character is found at Benisalem, where it was first worked in 1836; at Selva, where it has been

mined since 1851; near Santa Maria and elsewhere. It is used in the industrial establishments of Palma, and in the manufacture of lime, plaster and bricks near the mines. A considerable quantity is also exported to Barcelona.

The inhabitants are principally devoted to agriculture, and most of the arable land is cultivated. The mountains are terraced; and the old pine woods have in many places given way to the olive, the vine and the almond tree, to fields of wheat and flax, or to orchards of figs and oranges. For the last-mentioned fruits the valley of Sóller is one of the most important districts, the produce being largely transmitted to France. The yield of oil is very considerable, and Inca is the centre of the oil district. The wines are light but excellent, especially the Muscadel and Montona. During the summer there is often great scarcity of water; but, according to a system handed down by the Moors, the rains of autumn and winter are collected in enormous reservoirs, which contain sufficient water to last through the dry season; and on the payment of a certain rate, each landholder has his fields flooded at certain intervals. Mules are used in the agriculture and traffic of the island. The cattle are small, but the sheep are large and well fleeced. Pigs are reared for export to Barcelona, and there is abundance of poultry and small game. Brandy is made and exported in large quantities. Excellent woollen and linen cloths are woven; the silkworm is reared and its produce manufactured; and canvas, rope and cord are largely made, from both native and foreign materials.

The roads are excellent, the four principal being those from Alcudia, Manacor, Sóller and Andraitx to the capital. Forty-eight miles of railway were open at the beginning of the 20th century. The main line runs from Palma to Manacor and Alcudia. The telegraphic system is fairly complete, and there is regular steam communication with Barcelona and Alicante. The principal towns include—besides Palma (63,937), Felanitx (11,294) and Manacor (12,408), which are described in separate articles—Andraitx (6516), Inca (7579), Llummayor (8859), Pollensa (8308), Santañy (6692) and Sóller (8026).

MAJORIAN (Julius Valerius Majorianus), emperor of the West from 457 to 461. He had distinguished himself as a general by victories over the Franks and Alemanni, and six months after the deposition of Avitus he was declared emperor by the regent Ricimer. After repelling an attack by the Vandals upon Campania (458) he prepared a large force, composed chiefly of barbarians, to invade Africa, which he previously visited in disguise. Having during his stay in Gaul defeated and concluded an alliance with Theodoric the Visigoth, at the beginning of 460 he crossed the Pyrenees for the purpose of joining the powerful fleet which he had collected at Carthagena. The Vandal king Genseric, however, after all overtures of peace had been rejected, succeeded through the treachery of certain officers in surprising the Roman fleet, most of the ships being either taken or destroyed. Majorian thereupon made peace with Genseric. But his ill-success had destroyed his military reputation; his efforts to put down abuses and improve the condition of the people had roused the hatred of the officials; and Ricimer, jealous of his fame and influence, stirred up the foreign troops against him. A mutiny broke out in Lombardy, and on the 2nd of August 461 Majorian was forced to resign. He died five days afterwards, either of dysentery or by violence. Majorian was the author of a number of remarkable laws, contained in the Theodosian Code. He remitted all arrears of taxes, the collection of which was for the future placed in the hands of the local officials. He revived the institution of *defensores*, defenders of cities, whose duty it was to protect the poor and inform the emperor of abuses committed in his name. The practice of pulling down the ancient monuments to be used as building material, which was connived at by venal officials, was strictly prohibited. He also passed laws against compulsory ordination and premature vows of celibacy.

See Sidonius Apollinaris, *Panegyric of Majorian*; Gibbon, *Decline and Fall*, ch. xxxvi. (where an outline of the "novels" of Majorian is given); J. B. Bury, *Later Roman Empire*, bk. iii.

MAJORITY (Fr. *majorité*; Med. Lat. *majoritas*; Lat. *major*, greater), a term signifying the greater number. In legislative and deliberative assemblies it is usual to decide questions by a majority of those present at a meeting and voting. In law, majority is the state of being of full age, which in the United Kingdom is twenty-one years of age. A person attains his majority at twelve o'clock at night of the day preceding his twenty-first birthday (see Infant; Age).

MAJUBA (properly Amajuba, Zulu for "the hill of doves"), a mountain in northern Natal, part of the Drakensberg range, rising about 7000 ft. above the sea and over 2000 ft. above the level of the surrounding country. It overlooks the pass through the Drakensberg known as Laing's Nek, is 8 m. S. of the Transvaal border and 18 m. N. of the town of Newcastle. The railway from Durban to Johannesburg skirts the base of the

mountain. During the Boer War of 1880-81 Majuba was occupied on the night of the 26th of February 1881 by some 600 British troops under Sir George Pomeroy Colley. On the following morning the hill was stormed by the Boers under Piet Joubert and the British routed, Colley being among the slain.

MAKALAKA, a general designation used by the Bechuana, Matabele and kindred peoples, for conquered or slave tribes. Thus many of the tribes subjugated by the Makololo chief, Sebituane, about 1830 were called Makalaka (see David Livingstone's *Missionary Travels and Researches in South Africa*, London, 1857). By early writers on south-central Africa certain of the inhabitants of Barotseland were styled Makalaka; the name is more frequently used to designate the Makalanga, one of the tribes now classed as Mashonas (*q.v.*), who were brought into subjection by the Matabele.

MAKARAKA, or Iddio ("Cannibals"), a negroid people of Central Africa, closely related to the powerful Azandeh or Niam-Niam race, occupying the Bahr-el-Ghazal west of Lado. They came originally from the country of the Kibas, north of the Welle. Dr W. Junker described them as among the most trustworthy, industrious and intelligent people of the Bahr-el-Ghazal. They are a reddish-black, with nose less flat and cheek-bones less prominent than the ordinary negroes, and, unlike the latter, do not extract the incisors. Their long silky hair is built up in the most fantastic form by means of vegetable substances. They are well-known for strength and staying power.

See W. Junker, *Travels in Africa* (1890-1892).

MAKART, HANS (1840-1884), Austrian painter, born at Salzburg, was the son of an inspector of the imperial castle. He has been aptly called the first German *painter* of the 19th century. When he, as a youth, entered the Vienna Academy German art was under the rule of Cornelius's cold classicism. It was entirely intellectual and academic. Clear and precise drawing, sculpturesque modelling, and pictorial erudition were the qualities most esteemed; and it is not surprising that Makart, poor draughtsman to the very last, with a passionate and sensual love of colour, and ever impatient to escape the routine of art-school drawing, was found to be "devoid of all talent" and forced to leave the Vienna Academy. He went to Munich, and after two years of independent study attracted the attention of Piloty, under whose guidance he made rapid and astonishing progress. The first picture he painted under Piloty, "Lavoisier in Prison," though timid and conventional, attracted attention by its sense of colour. In the next, "The Knight and the Water Nymphs," he first displayed the decorative qualities to which he afterwards sacrificed everything else in his work. With the "Cupids" and "The Plague in Florence" of the next year his fame became firmly established. "Romeo and Juliet" was soon after bought by the Austrian emperor for the Vienna Museum, and Makart was invited to come to Vienna, where a large studio was placed at his disposal. In Vienna Makart became the acknowledged leader of the artistic life of the city, which in the 'seventies passed through a period of feverish activity, the chief results of which are the sumptuously decorated public buildings of the Ringstrasse.

The enthusiasm of the time, the splendour of the fêtes over which Makart presided, and the very obvious appeal of his huge compositions in their glowing richness of colour, in which he tried to emulate Rubens, made him appear a very giant to his contemporaries in Vienna, and indeed in all Austria and Germany. The appearance of each of his ambitious historical and allegorical paintings was hailed with enthusiasm—the "Catherina Cornaro," "Diana's Hunt," "The Entry of Charles V. into Antwerp," "Abundantia," "Spring," "Summer," "The Death of Cleopatra" and the "Five Senses." He reached the zenith of his fame when, in 1879, he designed, single-handed, the costumes, scenic setting, and triumphal cars of the grand pageant with which the citizens of Vienna celebrated the silver wedding of their rulers. Some 15,000 people participated in the pageant, all dressed in the costumes of the Rubens and Rembrandt period. Makart died in Vienna in October 1884.

Unfortunately Makart was in the habit of using such villainous pigments and mediums that in the few decades which have passed since his death, the vast majority of his large paintings have practically perished. The blues have turned into green; the bitumen has eaten away the rich glow of the colour harmonies; the thickly applied paint has cracked and in some instances crumbled away. And this loss of their chief quality has accentuated the weaknesses of these pictures—the faulty drawing, careless and hasty execution, lack of deeper significance and prevalence of glaring anachronisms. Important examples of his work are to be found at the galleries of Vienna, Berlin, Hamburg and Stuttgart. For the Vienna Museum he also executed a series of decorative lunettes.

MAKING-UP PRICE, a term used in the London and other British Stock Exchanges, to denote the price at which speculative bargains are carried over from one account to the next. The carrying over of a "bull" position in Eries, for example, implies a sale for cash and a simultaneous repurchase for the new account, both bargains being done at the making-up price. This is fixed at noon on carry-over day, in accordance with the market price then current (see ACCOUNT; STOCK EXCHANGE). The term is also used in New York, where the making-up prices are fixed at the end of a day's business, in accordance with the American system of daily settlements.

MAKÓ, a town of Hungary, capital of the county of Csanád 135 m. S.E. of Budapest by rail. Pop. (1900), 33,701. It is situated near the right bank of the Maros, and is a typical Hungarian town of the Alföld. The most noteworthy building is the palace of the bishop of Csanád, whose usual residence is in Temesvár. The town possesses numerous mills, and the surrounding country is fertile. The communal lands are extensive; they afford excellent pasturage for horses and sheep and also for large herds of horned cattle, for the size and quality of which Makó has obtained a high repute.

MAKRAN, or MEKRAN, a province of Baluchistan, fringing the Arabian Sea from Persia almost to Sind for about 200 m. It is subject to the khan of Kalat under British political supervision. Estimated area, 26,000 sq. m.; estimated pop. (1903), 78,000. The long lateral valley of Kej is usually associated with Makran in early geographical records. The Kej-Macoran of Marco Polo is the Makran of to-day.

The long stretch of sandy foreshore is broken on the coast-line by the magnificent cliffs of Malan, the hammer-shaped headlands of Ormarah and Gwadar, and the precipitous cliffs of Jebel Zarain, near Pasni. Within them lies the usual frontier band of parallel ridges, alternating with narrow valleys. Amongst them the ranges called Talana and Talur are conspicuous by their height and regular configuration. The normal conformation of the Baluchistan frontier is somewhat emphasized in Makran. Here the volcanic action, which preceded the general upheaval of recent strata and the folding of the edges of the interior highlands, is still in evidence in occasional boiling mud volcanoes on the coast-line. It is repeated in the blazing summit of the Kuh-i-taftan (the burning mountain of the Persian frontier) which is the highest active volcano in Asia (13,000 ft.), and probably the farthest inland. Evidence of extinct mud volcanoes exists through a very wide area in Baluchistan and Seistan. Probably the *miri*, or fort, at Quetta represents one of them. The coast is indented by several harbours. Ormarah, Khor Kalmat, Pasni and Gwadar are all somewhat difficult of approach by reason of a sand-bar which appears to extend along the whole coast-line, and which is very possibly the last evidence of a submerged ridge; and they are all subject to a very lively surf under certain conditions of wind. Of these the port of Gwadar (which belongs to Muscat and is therefore foreign territory) is the most important. They all are (or were) stations of the Indo-Persian telegraph system which unites Karachi with Bushire. With the exception of the Kej valley, and that of the Bolida, which is an affluent of the Kej, there are no considerable spaces of cultivation in Makran. These two valleys seem to concentrate the whole agricultural wealth of the country. They are picturesque, with thick groves of date palms at intervals, and are filled with crops and orchards. They are indeed exceedingly beautiful; and yet the surrounding waste of hills is chiefly a barren repetition of sun-cracked crags and ridges with parched and withered valleys intersecting them, where a trickle of salt water leaves a white and leprous streak amongst the faded tamarisk or the yellow stalks of last season's grass. Makran is the home of remnants of an innumerable company of mixed people gathered from the four corners of Asia and eastern Africa. The ancient Dravidians, of whom the Brahui is typical, still exist in many of the districts which are assigned to them in Herodotus. Amongst them there is always a prominent Arab element, for the Arabs held Makran even before they conquered Sind and made the Kej valley their trade highway to India. There are negroes on the coast, bred from imported slaves. The Meds of the Indus valley still form the greater part of the fishing population, representing the Ichthyophagi of Arrian. The old Tajik element of Persia is not so evident in Makran as it is farther north; and the Karak pirates whose depredations led to the invasion of India and the conquest of Sind, seem to have disappeared altogether. The fourth section includes the valleys formed by the Rakshān and Mashkel, which, sweeping downwards from the Kalat highlands and the Persian border east and west, unite to break through the intervening chain of hills northward to form the Mashkel swamps, and define the northern limits of Makran. In these valleys are narrow strips of very advanced cultivation, the dates of Panjgur being generally reckoned superior even to those of the Euphrates. The great Mashkel swamp and the Kharan desert to the east of it, mark the flat phase of southern Baluchistan topography. It is geologically part of an ancient inland lake or sea which included the present swamp regions of the Helmund, but not the central depression of the Lora. The latter is buttressed against hills at a much higher elevation than the Kharan desert, which is separated from the great expanse of

the Helmund desert within the borders of Afghanistan by a transverse band of serrated hills forming a distinct watershed from Nushki to Seistan. Here and there these jagged peaks appear as if half overwhelmed by an advancing sea of sand. They are treeless and barren, and water is but rarely found at the edges of their foothills. The Koh-i-Sultan, at the western extremity of the northern group of these irregular hills, is over 6000 ft. above sea-level, but the general level of the surrounding deserts is only about 2000 ft., sinking to 1500 ft. in the Mashkel Hamun and the Gaod-i-Zirreh.

The whole of this country has been surveyed by Indian surveyors and the boundary between Persian and British Baluchistan was demarcated by a commission in 1895-1896. In 1898 a column of British troops under Colonel Mayne was despatched to Makran by sea, owing to a rebellion against the authority of the khan of Kalat, and an attack made by some Makran chiefs on a British survey party. The campaign was short and terminated with the capture of the Kej citadel. Another similar expedition was required in 1901 to storm the fort at Nodiz. The headquarters of the native governor, under the khan of Kalat, are at Turbat, with deputies at Tump, Kolwa, Pasni and Panjgur. A levy corps, with two British officers, is stationed along the western frontier. The port of Gwadur forms an enclave belonging to the sultan of Muscat.

Baluchistan District Gazetteer, vol. vii. (Bombay, 1907).

(T. H. H.*)

MAKSOORA, the term in Mahommedan architecture given to the sanctuary or praying-chamber in a mosque, which was sometimes enclosed with a screen of lattice-work; the word is occasionally used for a similar enclosure round a tomb.

MALABAR, a district of British India, in the Madras Presidency. Geographically the name is sometimes extended to the entire western coast of the peninsula. Properly it should apply to the strip below the Ghāts, which is inhabited by people speaking the Malayalam language, a branch of the Dravidian stock, who form a peculiar race, with castes, customs and traditions of their own. It would thus be coextensive with the old kingdom of Chera, including the modern states of Travancore and Cochin, and part of Kanara. In 1901 the total number of persons speaking Malayalam in all India was 6,029,304.

The district of Malabar extends for 145 m. along the coast, running inland to the Ghāts with a breadth varying from 70 to 25 m. The administrative headquarters are at Calicut. Area, 5795 sq. m. Malabar is singularly diversified in its configuration; from the eastward, the great range of the Western Ghāts, only interrupted by the Palghāt gap, looks down on a country broken by long spurs, extensive ravines, dense forests and tangled jungle. To the westward, gentler slopes and downs, and gradually widening valleys closely cultivated, succeed the forest uplands, till, nearer the seaboard, the low laterite table-lands shelve into rice plains and backwaters fringed with coco-nut palms. The coast runs in a south-easterly direction, and forms a few headlands and small bays, with a natural harbour in the south at Cochin. In the south there is considerable extent of table-land. The mountains of the Western Ghāts run almost parallel to the coast, and vary from 3000 to 7000 ft. in height. One of the most characteristic features of Malabar is an all but continuous chain of lagoons or backwaters lying parallel to the coast, which have been formed by the action of the waves and shore currents in obstructing the waters of the rivers. Connected by artificial canals, they form a cheap means of transit; and a large local trade is carried on by inland navigation. Fishing and fishcuring is an important industry. The forests are extensive and of great value, but they are almost entirely private property. The few tracts which are conserved have come into government hands by escheat or by contract. Wild animals include the elephant, tiger, panther, bison, *sambhar*, spotted deer, Nīlgiri ibex, and bear. The population in 1901 was 2,800,555, showing an increase of 5.6% in the decade.

The staple crop is rice, the next most important product being coco-nuts. Coffee is grown chiefly in the upland tract known as the Wynaad, where there are also a few acres under tea. The Madras railway crosses the district and has been extended from Calicut to Cannanore along the coast. There are eleven seaports, of which the principal are Calicut, Tellicherry, Cannanore and Cochin. The principal exports are coffee, coco-nut products and timber. There are factories for cleaning coffee, pressing coir and making matting, making tiles, sawing timber and weaving cotton.

See *Malabar District Gazetteer* (Madras, 1908).

MALABARI, BEHRAMJI (1853-), Indian journalist and social reformer, was born in 1853 at Baroda, the son of a poor Parsi in the employment of the state, who died shortly after his birth. His mother

took him to Surat, where he was educated in a mission school, but he never succeeded in gaining an academical degree. Coming to Bombay, he fell under the influence of Dr John Wilson, principal of the Scottish College. As early as 1875 he published a volume of poems in Gujarati, followed in 1877 by *The Indian Muse in English Garb*, which attracted attention in England, notably from Tennyson, Max Müller, and Florence Nightingale. His life work began in 1880 when he acquired the *Indian Spectator*, which he edited for twenty years until it was merged in the *Voice of India*. In 1901 he became editor of *East and West*. Always holding aloof from politics, he was an ardent and indefatigable advocate of social reform in India, especially as regards child marriage and the remarriage of widows. It was largely by his efforts, both in the press and in tours through the country, that the Age of Consent Act was passed in 1891. His account of his visits to England, entitled *The Indian Eye on English Life* (1893), passed through three editions, and an earlier book of a somewhat satirical nature, *Gujarat and the Gujaratis* (1883), was equally popular.

See R. P. Karkaria, *India, Forty Years of Progress and Reform*, (London, 1896).

MALABON, a town of the province of Rizal, Luzon, Philippine Islands, 1 m. inland from the shore of Manila Bay and 3 m. N. of the city of Manila, with which it is connected by an electric tramway. Pop. (1903), 20,136. The leading industries are the refining of sugar, fishing, trade, the weaving of jusi cloth, the making of cigars, and the cultivation of ilang-ilang-trees (*Cananga odorata*) for their flowers, from which a fine perfume is distilled; ilang-ilang is one of the principal exports, mostly to France. Tagalog and Spanish are the principal languages. Malabon was formerly known as Tambóbong.

MALACCA, a town on the west coast of the Malay Peninsula, in 2° 14′ N., 102° 12′ E., which, with the territory lying immediately around and behind it forms one of the Straits Settlements, and gives its name to the Straits which divide Sumatra from the Malay Peninsula. Its name, which is more correctly transliterated *mĕlāka*, is that of a species of jungle fruit, and is also borne by the small river on the right bank of which the old Dutch town stands. The Dutch town is connected by a bridge with the business quarter on the left bank, which is inhabited almost exclusively by Chinese, Eurasians and Malays.

Malacca, now a somnolent little town, a favourite resort of rich Chinese who have retired from business, is visited by few ships and is the least important of the three British settlements on the Straits which give their name to the colony. It has, however, a remarkable history. The precise date of its foundation cannot be ascertained, but there is strong reason to believe that this event took place at the earliest in the 14th century. The Roman youth Ludovigo Barthema is believed to have been the first European to visit it, some time before 1503; and in 1509 Diogo Lopez de Siqueira sailed from Portugal for the express purpose of exploiting Malacca. At first he was hospitably received, but disagreements with the natives ensued and word was brought to Siqueira by Magellan, who was one of his company, that a treacherous attack was about to be made upon his ships. Siqueira then sent a native man and woman ashore “with an arrow passed through their skulls” to the sultan, “who was thus informed,” says de Barros, “through his subjects that unless he kept a good watch the treason which he had perpetrated would be punished with fire and sword.” The sultan retaliated by arresting Ruy de Araujo, the factor, and twenty other men who were ashore with him collecting cargo for the ships. Siqueira immediately burned one of his vessels and sailed direct for Portugal. In 1510 Mendez de Vasconcellos with a fleet of four ships set out from Portugal “to go and conquer Malacca,” but d’Alboquerque detained him at Goa, and it was not until 1511 that d’Alboquerque himself found time to visit Malacca and seek to rescue the Portuguese prisoners who all this time had remained in the hands of the sultan. An attack was delivered by d’Alboquerque on the 25th of July 1511, but it was only partially successful, and it was not until the 4th of August, when the assault was repeated, that the place finally fell. Since that time Malacca has continued to be the possession of one or another of the European Powers. It was a Portuguese possession for 130 years, and was the headquarters of their trade and the base of their commercial explorations in south-eastern Asia while they enjoyed, and later while they sought to hold, their monopoly in the East. It was from Malacca, immediately after its conquest, that d’Alboquerque sent d’Abreu on his voyage of discovery to the Moluccas, or Spice Islands, which later were the objective of Magellan’s voyage of circumnavigation. During the Portuguese tenure of Malacca the place was attacked at least twice by the Achinese; its shipping was harried by Lancaster in 1592, when the first British fleet made its way into these seas; it was besieged by the Dutch in 1606, and finally fell to a joint attack of the Dutch and the Achinese in 1641. It was under the Portuguese government that St Francis Xavier started a mission in Malacca, the first Christian mission in Malayan lands.

The Dutch held Malacca till 1795, when it was taken from them by Great Britain, and the Dutch system of monopoly in the straits was forthwith abolished. The colony was restored to the Dutch, however, in 1818, but six years later it came finally into the hands of Great Britain, being exchanged by a treaty with Holland for the East India Company’s settlement of Benkulen and a few other unimportant places on the western coast of Sumatra. By this treaty the Dutch were precluded from interference in the affairs of the Malay Peninsula, and Great Britain from similar action in regard to the States of Sumatra, with the sole exception of Achin, the right to protect that state being maintained by Great Britain until 1872 when it was finally abandoned by a treaty

concluded with Holland in that year. The Dutch took advantage of this immediately to invade Achin, and the strife begun in 1873 still continues and is now a mere war of extermination. It was not until 1833 that the whole territory lying at the back of Malacca was finally brought under British control, and as late as 1887 the Negri Sembilan, or Nine States, which adjoin Malacca territory on the east and north-east, were completely independent. They to-day form part of the Federated Malay States, which are under the protection of Great Britain, and are governed with the assistance and by the advice of British officers.

Malacca, in common with the rest of the Straits Settlements, was administered by the government of India until 1867, when it became a crown colony under the control of the Colonial Office. It is to-day administered by a resident councillor, who is responsible to the governor of the Straits Settlements, and by a number of district officers and other officials under his direction. The population of the town and territory of Malacca in 1901 was 94,487, of whom 74 were Europeans and Americans, 1598 were Eurasians, the rest being Asiatics (chiefly Malays with a considerable sprinkling of Chinese). The population in 1891 was 92,170, and the estimated population for 1905 was 97,000. The birth-rate is about 35 per thousand, and the death-rate about 29 per thousand. The trade of this once flourishing port has declined, most of the vessels being merely coasting craft, and no large line of steamers holding any communication with the place. This is due partly to the shallowness of the harbour, and partly to the fact that the ports of Penang and Singapore, at either entrance to the straits, draw all the trade and shipping to themselves. The total area of the settlement is about 700 sq. m. The colony is wholly agricultural, and the land is almost entirely in the hands of the natives. About 50,000 acres are under tapioca, and about 9000 acres are under rubber (*hevea*). This cultivation is rapidly extending. There are still considerable areas unoccupied which are suitable for rubber and for coco-nuts. The settlement is well opened up by roads; and a railway, which is part of the Federated Malay States railway system, has been constructed from the town of Malacca to Tampin in the Negri Sembilan. There is a good rest-house at Malacca and a comfortable seaside bungalow at Tanjong Kling, seven miles from the town. Malacca is 118 m. by sea from Singapore and 50 m. by rail from Seremban, the capital of the Negri Sembilan. There is excellent snipe-shooting to be had in the vicinity of Malacca.

See *The Commentaries of d'Alboquerque* (Hakluyt Society); *The Voyages and Adventures of Fernand Mendez Pinto* (London, 1653); *An Account of the East Indies*, by Captain Alexander Hamilton (Edinburgh. 1727); Valentyn's *History of Malacca*, translated by Dudley Hervey; *Journal of the Straits Branch of the Royal Asiatic Society*; "Our Tropical Possessions in Malayan India," by the same author, *ibid.*; *Further India*, by Hugh Clifford (London, 1904); *British Malaya*, by Sir Frank Swettenham (London, 1906).

(H. Cl.)

MALACHI, the name assigned to the last book of the Old Testament in English (the last of the "prophets" in the Hebrew Bible), which according to the title (Mal. i. 1) contains the "word of Yahweh to Israel by the hand of Malachi." In form the word means "my messenger." It could be explained as a contraction of Malachiah, "messenger of Yahweh"; but the Septuagint is probably right in not regarding it as a proper name ("by the hand of His messenger"). Not only do we know nothing from internal or external evidence of the existence of a prophet of this name,[1] but the occurrence of the word in the title is naturally explained as derived from iii. 1: "Behold, I send my messenger" (cf. ii. 7). The prophecy must, therefore, be regarded as anonymous; the title was added by the compiler who wrote similar editorial titles to the anonymous prophecies beginning Zech. ix. 1, xii. 1.

The contents of the prophecy fall into a series of clearly marked sections, as in the paragraph division of the Revised Version. These apply, in various ways, the truth emphasized at the outset: Yahweh's love for Israel in contrast with his treatment of Edom (i. 2-5). Israel's response should be a proper regard for the ritual of His worship; yet any offering, however imperfect, is thought good enough for Yahweh's altar (i. 6-14). Let the priests, who are responsible, take warning, and return to their ancient ideals (ii. 1-9). Again, the common Fatherhood of God should inspire a right relation among fellow Israelites, not such conduct as the divorce of Israelite wives in order to marry non-Israelite women (ii. 10-16).[2] The prevalence of wrong-doing has provoked scepticism as to righteous judgment; but the messenger of Yahweh is at hand to purge away indifferentism from worship and immorality from conduct (ii. 17-iii. 6). The payment of tithes now withheld will be followed by the return of prosperity (iii. 7-12). Religion may seem useless, but Yahweh remembers His own, and will soon in open judgment distinguish them from the irreligious (iii. 13-iv. 3). The book closes with an appeal to observe the law of Moses, and with a promise that Elijah shall come before the threatened judgment.[3]

The topics noticed clearly relate the prophecy to the period of Ezra and Nehemiah, when the Temple had been rebuilt (i. 10; iii. 1, 10), the province of Judah was under a Persian governor (i. 8), and there had been time enough for the loss of earlier enthusiasm. The majority of modern scholars are agreed that the prophet prepares for the work of those reformers (Ezra, 458; Nehemiah, 444, 432 B.C.). The abuses of which he particularly complains are such as were found rampant by Ezra and Nehemiah—marriage with foreign women (ii. 11; cf. Ezra ix.; Neh. xiii. 23 seq.; Deut. vii. 3) and failure in payment of sacred dues (iii. 8 seq.; cf. Neh. x. 34 seq.; xiii. 10 seq.; Deut. xxvi. 12 seq.). The priests have fallen into contempt (ii. 9) and have neglected what is still one of their chief trusts, the oral law (ii. 6 seq.). The priestly code of written law was not promulgated until 444 B.C. (Neh. viii.-x.); "Malachi" writes under the influence of the earlier Code of Deuteronomy only,[4] and must therefore belong to a date prior to 444. The independent character of the attack on current abuses also suggests priority to the work of Ezra in 458. The prophecy affords an interesting and valuable glimpse of the post-exilic community, with its various currents of thought and life. The completion of the second Temple (516 B.C.) has been followed by disillusionment as to the anticipated prosperity, by indifference to worship, scepticism as to providence, and moral laxity.[5] In view of these conditions, the prophet's message is to reassert the true relation of Israel to Yahweh, and to call for a corresponding holiness, especially in regard to questions of ritual and of marriage. He saw that "the disobedience of his time was the outcome of a lowered

morality, not of a clearer spiritual vision."[6] A strong sense of the unique privileges of the children of Jacob, the objects of electing love (i. 2), the children of the Divine Father (ii. 10), is combined with an equally strong assurance of Yahweh's righteousness notwithstanding the many miseries that pressed on the unhappy inhabitants of Judaea. At an earlier date the prophet Haggai had taught that the people could not expect Yahweh's blessing while the Temple lay in ruins. In Malachi's time the Temple was built (i. 10) and the priests waited in their office, but still a curse seemed to rest on the nation's labours (iii. 9). To Malachi the reason of this is plain. The "law of Moses" was forgotten (iv. 4 [iii. 22]); let the people return to Yahweh, and He will return to them. It was in vain to complain, saying, "Every one that doeth evil is good in the eyes of Yahweh," or "Where is the God of judgment?"—vain to ask "Wherein shall we return?" Obedience to the law is the sure path to blessing (ii. 17-iii. 12).

He calls the people to repentance, and he enforces the call by proclaiming the approach of Yahweh in judgment against the sorcerers, the adulterers, the false swearers, the oppressors of the poor, the orphan and the stranger. Then it shall be seen that He is indeed a God of righteous judgment, distinguishing between those that serve Him and those that serve Him not. The Sun of Righteousness shall shine forth on those that fear Yahweh's name; they shall go forth with joy, and tread the wicked under foot. The conception of the day of final decision, when Yahweh shall come suddenly to His temple (iii. 1) and confound those who think the presumptuous godless happy (iii. 15), is taken from earlier prophets, but is applied wholly within the Jewish nation. The day of Yahweh would be a curse, not a blessing, if it found the nation in its present state: the priests listlessly performing a fraudulent service (i. 7-ii. 9), the people bound by marriage to heathen women, while the tears of the daughters of Israel, thrust aside to make way for strangers, cover the altar (ii. 11-16), all faith in divine justice gone (ii. 17; iii. 14 seq.), sorcery, uncleanness, falsehood and oppression rampant (iii. 5), the house of God deprived of its dues (iii. 8), and the true fearers of God a little flock gathered together in private exercises of religion (perhaps the germ of the later synagogue) in the midst of a godless nation (iii. 16). That the day of Yahweh is delayed in such a state of things is but a new proof of His unchanging love (iii. 6), which refuses to consume the sons of Jacob. Meantime He is about to send His messenger to prepare His way before Him. The prophet Elijah must reappear to bring back the hearts of fathers and children before the great and terrible day of Yahweh come. Elijah was the advocate of national decision in the great concerns of Israel's religion; and it is such decision, a clear recognition of what the service of Yahweh means, a purging of His professed worshippers from hypocritical and half-hearted service (iii. 3) that Malachi with his intense religious earnestness sees to be the only salvation of the nation. In thus looking to the return of the ancient prophet to do the work for which later prophecy is too weak, Malachi unconsciously signalizes the decay of the order of which he was one of the last representatives; and the somewhat mechanical measure which he applies to the people's sins, as for example when he teaches that if the sacred dues were rightly paid prosperous seasons would at once return (iii. 10), heralds the advent of that system of formal legalism which thought that all religious duty could be reduced to a system of set rules. Yet Malachi himself is no mere formalist. To him, as to the Deuteronomic legislation, the forms of legal observance are of value only as the fitting expression of Israel's peculiar sonship and service, and he shows himself a true prophet when he contrasts the worthless ministry of unwilling priests with the pure offering of prayer and praise that rises from the implicit monotheism of even Gentile worship[7] (i. 11), or when he asserts the brotherhood of all Israelites under their one Father (ii. 10), not merely as a ground of separation from the heathen, but as inconsistent with the selfish and cruel freedom of divorce current in his time.[8] The book is a significant landmark in the religious history of Israel. Its emphasis on the observance of ritual finds fullest development in the Priestly Code, subsequently promulgated; its protest against foreign marriages is made effective through the reforms of Ezra and Nehemiah;[9] the influence of its closing words on later expectation is familiar to every reader of the new Testament.[10]

The style of Malachi, like his argument, corresponds in its generally prosaic character to that transformation or decay of prophecy which began with Ezekiel; and Ewald rightly called attention to the fact that the conduct of the argument already shows traces of the dialectic manner of the schools. Yet there is a simple dignity in the manner not unworthy of a prophet, and rising from time to time to poetical rhythm.

LITERATURE.—Nowack, *Die kleinen Propheten* (1897; 2nd ed., 1904); Wellhausen, id. (iii. 1898); G. A. Smith, *The Book of the Twelve* (ii. 1898); A. C. Welch, art. "Malachi" in Hastings's *Dict. of the Bible*, iii. 218-222 (1900); C. C. Torrey, id. in *Ency. Bib.* iii. c. 2907-2910 (1902); Marti, *Dodekapropheton* (1904); Stade, *Biblische Theologie des Alten Test.* § 141 (1905); Driver, *The Minor Prophets*, ii. (Century Bible, 1906).

(W. R. S.; H. W. R.*)

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1 A Hebrew tradition given in the Targum of Jonathan, and approved by Jerome, identifies Malachi with Ezra the priest and scribe.

2 Torrey (*Ency. Bib.* c. 2908) holds that the reference here is purely figurative; "Judah has dealt falsely with the wife of his youth, the covenant religion, and is wedding a strange cult." But he assigns the book to the 4th century.

3 This closing prophecy may possibly be a later addition (so Marti) rounding off the prophetic canon by reference to the two great names of Moses and Elijah, and their characteristic activities. In this case, "Elijah" will represent an early interpretation (cf. Ecclus. xlviii. 10) of the "messenger," originally conceived as a purely ideal figure. The only other passage in the book whose originality is not generally accepted is that referring to mixed marriages (ii. 11, 12).

4 It is the Deuteronomic law that is most familiar to him, as appears from his use of the name Horeb for the mountain of the law, and the Deuteronomic phrase "statutes and judgments" (iv. 4), from his language as to tithes and offerings (iii. 8, 10; cf. Deut. xii. 11; xxvi. 12), and especially from his conception of the priesthood as resting on a covenant with Levi (ii. 4 seq.). Malachi indeed assumes that the "whole tithe"—the Deuteronomic phrase for the tithe in which the Levites shared—is not stored in each township, but brought into the treasury at the Temple. But this was a modification of the Deuteronomic law naturally called for under the circumstances of the return from Babylon, and Neh. x. and xiii. produce the impression that it was not introduced for the first time by Ezra and Nehemiah, though the collection of the tithe was enforced by them. See further, W.R.S. in *O.T.J.C.* ii. 425-427.

5 Cf. Stade's reconstruction, *G.V.I.* ii. 128-138.

6 Welch in *D.B.* iii. 220.

7 This remarkable utterance is sometimes (as by W.R.S.) interpreted of the worship of Jews scattered in the

Dispersion: reasons for the above view are given by Driver.

8 In ii. 16 the Targum renders “If thou hatest her put her away.” It is characteristic of later Judaism that an arbitrary exegesis transformed the above anticipation of the doctrine of marriage laid down in the gospel into an express sanction of the right of the husband to put away his wife at will.

9 “The permanence of Judaism depended on the religious separateness of the Jews” (Ryle, *Ezra and Nehemiah*, p. 143).

10 Matt. xvii. 3, 4, 10-13; xxvii. 47, 49; John i. 21, 25.

MALACHITE, a copper-ore of fine green colour, sometimes polished as an ornamental stone. The name is derived from Gr. μαλάχη, the mallow, in allusion to the colour of the mineral being rather like that of the mallow-leaf. Malachite was perhaps one of the green minerals described by Theophrastus under the general name of σμάραγδος; and according to the late Rev. C. W. King it was probably the *smaragdus medicus* of Pliny, whilst his *molochites* seems to have been a different stone from our malachite and may have been a green jasper. It is suggested by J. L. Myres (*Ency. Bib.*) that malachite may have been the Heb. *soham*, of the high priest’s breastplate.

Malachite is a basic cupric carbonate, represented by the formula $CuCO_3Cu(HO)_2$, and has usually been formed by the action of meteoric agencies on other copper-minerals; hence it is found in the upper part of ore-deposits, often as an incrustation, and occasionally as a pseudomorph after cuprite, chalcocite, &c. When formed, as commonly happens, by the alteration of copper-pyrites the iron of this mineral usually takes the form of limonite, which may remain associated with the malachite. Occasionally, though but rarely, malachite occurs in small dark-green prismatic crystals of the monoclinic system. Its usual mode of occurrence is in nodular or stalagmitic forms, with a mammillated, reniform or botryoidal surface, whilst in other cases it forms fibrous, compact or even earthy masses. The nodules, though commonly dull on the outside, may display on fracture a beautiful zonary structure, the successive layers often succeeding each other as curved deposits of light and dark tints. The colours include various shades of apple-green, grass-green, emerald-green and verdigris-green. Certain varieties exhibit a finely fibrous structure, producing on the fractured surface a soft silky sheen.

Whilst malachite is found in greater or less quantity in most copper-mines, the finer varieties useful for ornamental purposes are of very limited occurrence, and the lapidary has generally drawn his supply from Russia and Australia. The principal source in recent years has been the Medno-Rudiansk mine near Nizhne Tagilsk, on the Siberian side of the Urals, but it was formerly obtained from mines near Bogoslovsk to the north and Gumishev to the south of this locality. A mass from Gumishev, preserved in the museum of the Mining Institute of St Petersburg weighs 3240℔ and still larger masses have been found near Nizhne Tagilsk. The mineral is prized in Russia for use in mosaic-work, and for the manufacture of vases, snuff-boxes and various ornamental objects. Even folding doors, mantelpieces, table-tops and other articles of furniture have been executed in malachite, the objects being veneered with thin slabs cleverly fitted together so as to preserve the pattern, and having the interspaces filled up with fragments and powder of malachite applied with a cement. The malachite is sawn into slabs, ground with emery and polished with tripoli. Its hardness is less than 4, but it takes a good polish like marble: it is rather denser than marble, having a specific gravity of 3.7 to 4, but it is more difficult to work, in consequence of a tendency to break along the curved planes of deposition. Exceptionally fine examples of the application of malachite are seen in some of the columns of St Isaac’s Cathedral in St Petersburg, which are hollow iron columns encrusted with malachite. Large masses of ornamental malachite have been found in Australia, especially at the old Burra Burra copper-mine in South Australia. The Copper Queen and other mines in Arizona have yielded fine specimens of malachite associated with azurite, and polished slabs of the mixed minerals sometimes show the vivid green and the deep blue carbonate in very striking contrast. This natural association, cut as an ornamental stone, has been named, by Dr G. F. Kunz, azurmalachite. Malachite is occasionally used for cameo-work, and some fine antique examples are known. It was formerly worn as an amulet to preserve the wearer from lightning, contagion and witchcraft.

The mineral, when ground, has been used as a pigment under the name of “mountain green.” The coarser masses are extensively used, with other minerals, as ores of copper, malachite containing about 57% of metal. “Blue malachite” is a name sometimes given to azurite (*q.v.*), whilst “siliceous malachite” is a term inappropriately applied to chrysocolla (*q.v.*).

(F. W. R.*)

MALACHOWSKI, STANISLAW (1736-1809), Polish statesman, the younger son of Stanislaw Malachowski, palatine of Posen, the companion in arms of Sobieski. From his youth Malachowski laboured zealously for the good of his country, and as president of the royal court of justice won the honourable title of the “Polish Aristides.” He was first elected a deputy to the Coronation Diet of 1764, and the great Four Years’ Diet unanimously elected him its speaker at the beginning of its session in 1788. Accurately gauging the situation, Malachowski speedily gathered round him all those who were striving to uphold the falling republic and warmly supported every promising project of reform. He was one of the framers of the constitution of the

3rd of May 1791, exceeding in liberality all his colleagues and advocating the extension of the franchise to the towns and the emancipation of the serfs. He was the first to enter his name as a citizen of Warsaw in the civic register and to open negotiations with his own peasantry for their complete liberation. Disappointed in his hopes by the overthrow of the constitution, he resigned office and left the country in 1792, going first to Italy and subsequently to his estates in Galicia, where he was imprisoned for a time on a false suspicion of conspiracy. In 1807 Malachowski was placed at the head of the executive committee appointed at Warsaw after its evacuation by the Prussians, and when the grand duchy of Warsaw was created Malachowski became president of the senate under King Frederick Augustus of Saxony. In the negotiations with the Austrian government concerning the Galician salt-mines Malachowski came to the assistance of the depleted treasury by hypothecating all his estates as an additional guarantee. In 1809 he died at Warsaw. His death was regarded as a public calamity, and multitudes followed his remains to their last resting-place in the Church of the Holy Cross. In all the other towns of the grand duchy funeral services were held simultaneously as a tribute of the respect and gratitude of the Polish nation.

See August Sokolowski, *Illustrated History of Poland* (Pol.), vol. iv. (Vienna, 1900); *Life and Memoirs of S. Malachowski*, edited by Lucyan Siemienski (Pol; Cracow, 1853).

(R. N. B.)

MALACHY, ST (*c.* 1094-1148), otherwise known as Maol-Maodhog (or Maelmaedhog) Ua Morgair, archbishop of Armagh and papal legate in Ireland, was born at Armagh. His father, an Irish clergyman, the *Fearleighlinn*, or *lector*, at the university, was said to have been of noble family. Having been ordained to the priesthood, he for some time acted as vicar of Archbishop Celsus or Ceallach of Armagh, and carried out many reforms tending to increase conformity with the usage of the Church of Rome. In order to improve his knowledge of the Roman ritual he spent four years with Malchus, bishop of Lismore (in Munster), a strong advocate of Romanism. Here he became acquainted with Cormac MacCarthy, king of Desmond, who had sought refuge with Malchus, and, when he subsequently regained his kingdom, rendered great services to Malachy. On his return from Lismore, Malachy undertook the government of the decayed monastery of Bangor (in Co. Down), but very soon afterwards he was elected bishop of Connor (now a small village near Ballymena). After the sack of that place by the king of Ulster he withdrew into Munster; here he was kindly received by Cormac MacCarthy, with whose assistance he built the monastery of Ibrach (in Kerry). Meanwhile he had been designated by Celsus (in whose family the see of Armagh had been hereditary for many years) to succeed him in the archbishopric; in the interests of reform he reluctantly accepted the dignity, and thus became involved for some years in a struggle with the so-called heirs. Having finally settled the diocese, he was permitted, as had been previously stipulated by himself, to return to his former diocese, or rather to the smaller and poorer portion of it, the bishopric of Down. Although the Roman party had by this time obtained a firm hold in the north of Ireland, the organization of the Church had not yet received the sanction of the pope. Accordingly, in 1139, Malachy set out from Ireland with the purpose of soliciting from the pope the pallium (the token of archiepiscopal subjection to Rome) for the archbishop of Armagh. On his way to Rome he visited Clairvaux, and thus began a lifelong friendship with St Bernard. Malachy was received by Innocent II. with great honour, and made papal legate in Ireland, though the pope refused to grant the pallium until it had been unanimously applied for “by a general council of the bishops, clergy and nobles.” On his way home Malachy revisited Clairvaux, and took with him from there four members of the Cistercian order, by whom the abbey of Mellifont (in the county of Louth) was afterwards founded in 1141. For the next eight years after his return from Rome Malachy was active in the discharge of his legatine duties, and in 1148, at a synod of bishops and clergy held at Inis-Patrick (St Patrick’s Island, near Skerries, Co. Dublin), he was commissioned to return to Rome and make fresh application for the pallium; he did not, however, get beyond Clairvaux, where he died in the arms of St Bernard on the 2nd of November 1148. The object of his life was realized four years afterwards, in 1152, during the legateship of his successor. Malachy was canonized by Clement III. in 1190.

The influence of Malachy in Irish ecclesiastical affairs has been compared with that of Boniface in Germany. He reformed and reorganized the Irish Church and brought it into subjection to Rome; like Boniface, he was a zealous reformer and a promoter of monasticism. But perhaps his chief claim to distinction is that of having opened the first Cistercian monastery in Ireland, five more being soon afterwards established. Several works are attributed to him, but are all probably spurious. The most curious of these is a *Prophecy concerning the Future Roman Pontiffs*, which has produced an extensive literature. It is now generally attributed to the year 1590, and is supposed to have been forged to support the election of Cardinal Simoncelli to the papal chair.

St Bernard’s *Life* of Malachy, and two sermons on his death will be found in J. P. Migne, *Patrologia Latina*; clxxxii., clxxxiii.; see also *Annals of the Kingdom of Ireland by the Four Masters*, ed. J. O’Donovan (Dublin, 1851); G. Germano, *Vita, gesti e predittioni del padre san Malachia* (Naples, 1670); the ecclesiastical histories of Ireland by J. Lanigan (1829) and W. D. Killen (1875); A. Bellesheim, *Geschichte der katholischen Kirche in Irland*, Bd. I. (Mainz, 1890); G. T. Stokes, *Ireland and the Celtic Church* (6th ed., 1907); J. O’Hanlon, *Life of Saint Malachy* (Dublin, 1859); articles in *Dictionary of National Biography* and Herzog-Hauck’s *Realencyklopädie für protestantische Theologie*. On the *Prophecy*, see the treatise by C. F. Menêtrier (Paris, 1689); Marquis of Bute in *Dublin Review* (1885); A. Harnack in *Zeitschrift für Kirchengeschichte*, Bd. III.

MALACOSTRACA. Under this zoological title are included several groups of Crustacea (*q.v.*), united by characters which attest their common origin, though some, and probably all of them, were already separated in distant geological ages, and some have now attained a peculiar isolation. Throughout the whole, the researches made since 1860 have not only added a great throng of new species, genera and families, but have thrown a flood of light upon questions of their phylogeny, systematic arrangement, horizontal and bathymetric distribution, organization, habits of life and economic importance. There are at least seven orders: the stalk-eyed Brachyura, Macrura, Schizopoda, Stomatopoda, and the sessile-eyed Sympoda, Isopoda, Amphipoda. An ocular segment claimed by the former division is not present or in no case demonstrable in the latter. In neither does the terminal segment or telson, whether large or obsolescent, whether articulated or coalescent, carry appendages, unless occasionally in fusion with itself. Between the eyes and the tail-piece in all the orders nineteen segments are counted, the proof of a segment's existence depending on its separateness, complete or partial, or on a sutural indication, or else on the pair of appendages known to belong to it. All these marks may fail, and then the species must be proved to be Malacostracan by other evidence than the number of its segments; but if some exceptions exhibit fewer, none of the Malacostraca exhibits more than 19 (+1 or + 2) segments, unless the Nebaliidae be included. Of the corresponding pairs of appendages thirteen belong to the head and trunk, two pairs of antennae, one pair of mandibles, two pairs of maxillae, followed by three which may be all maxillipeds or may help to swell the number of trunk-legs to which the next five pairs belong. The abdomen or pleon carries the remaining six pairs, of which from three to five are called pleopods and the remainder uropods. Underlying the diversity of names and functions and countless varieties of shape, there is a common standard to which the appendages in general can be referred. In the maxillipeds and the trunk-legs it is common to find or otherwise easy to trace a seven-jointed stem, the endopod, from which may spring two branches, the epipod from the first joint, the exopod from the second.[1] The first antennae are exceptional in branching, if at all, at the third joint. In the mandibles and maxillae some of the terminal joints of the stem are invariably wanting. In the rest of the appendages they may either be wanting or indistinguishable. The latter obscurity results either from coalescence, to which all joints and segments are liable, or from subdivision, which occasionally affects joints even in the trunk-legs. The carapace, formerly referred only to the antennar-mandibular segments, may perhaps in fact contain elements from any number of other segments of head and trunk, Huxley, Alcock, Bouvier giving support to this opinion by the sutural or other divisional lines in *Potamobius*, *Nephrops*, *Thalassina*, and various fossil genera. Not all questions of classification internal to this division are yet finally settled. Between the Brachyura and Macrura some authors uphold an order Anomura, though in a much restricted sense, the labours of Huxley, Boas, Alcock and conjointly Alphonse Milne-Edwards and Bouvier, having resulted in restoring the Dromiidea and Raninidae to the Brachyura, among which de Haan long ago placed them. The French authors argue that from the macruran lobsters (*Nephropsidae*) anciently diverged two lines: one leading through the Dromiidea to the genuine Brachyura; or crabs, the other independently to the Anomura proper, which may conveniently be named and classed as *Macrura anomala*. Spence Bate maintained that the Schizopoda ought not to form a separate order, but to be ranged as a macruran tribe, "more nearly allied to the degraded forms of the Penaeidea than to those of any other group" (*"Challenger" Reports*, "Macrura," p. 472, 1888). According to Sars, the Sympoda (or Cumaceans), in spite of their sessile eyes, have closer affinities with the stalk-eyed orders. H. J. Hansen and others form a distinct order Tanaidea for the decidedly anomalous group called by Sars *Isopoda chelifera*.

1. Brachyura.—For the present, as of old, the true Brachyura are divided into four tribes: *Cyclometopa*, with arched front as in the common eatable crab; *Catometopa*, with front bent down as in the land-crabs and the little oyster-crab; *Oxyrhyncha*, with sharpened beak-like front as in the various spider-crabs; *Oxystomata*, including the Raninidae, and named not from the character of the front but from that of the buccal frame which is usually narrowed forwards. In these tribes the bold and active habits, the striking colours, or the fantastic diversities of structure, have so long attracted remark that recent investigations, while adding a multitude of new species and supplying the specialist with an infinity of new details, have not materially altered the scientific standpoint. New light, however, has been thrown upon the "intellectual" capacity of Crustacea by the proof that the spider-crabs deliberately use changes of raiment to harmonize with their surroundings, donning and doffing various natural objects as we do our manufactured clothes. Others have the power of producing sounds, one use to which they put this faculty being apparently to signal from their burrow in the sand that they are "not at home" to an inopportune visitor. Deep-sea exploration has shown that some species have an immensely extended range, and still more, that species of the same genus, and genera of the same family, though separated by great intervals of space, may be closely allied in character. A curious effect of parasitism, well illustrated in crabs, though not confined to them, has been expounded by Professor Giard, namely, that it tends to obliterate the secondary sexual characters. Modern research has discovered no crab to surpass *Macrocheira kämpferi*, De Haan, that can span between three and four yards with the tips of its toes, but at the other end of the scale it has yielded *Collodes malabaricus*, Alcock, "of which the carapace, in an adult and egg-laden female, is less than one-sixth of an inch in its greatest diameter." The most abyssal of all crabs yet known is *Ethusina abyssicola*, Smith, or what is perhaps only a variety of it, *E. challengeri*, Miers. Of the latter the "Albatross" obtained a specimen from a depth of 2232 fathoms (Faxon, 1895), of the former from 2221 fathoms, and of this S. I. Smith remarks that it has "distinctly faceted black eyes," although in them "there are only a very few visual elements at the tips of the immobile eye-stalks."

The *Brachyura anomala*, or Dromiidea, "have preserved the external characters and probably also the organization of the Brachyura of the Secondary epoch" (Milne-Edwards and Bouvier, 1901). They agree with the true crabs in not having appendages (uropods) to the sixth segment of the pleon, the atrophy being complete in the Homolidae and Homolodromiidae, whereas in the Dromiidae and Dynomenidae a pair of small plates appear to be vestiges of these organs. In the family Homolidae stands the strange genus *Latreillia*, Roux, with long slender limbs and triangular carapace after the fashion of oxyrhynch spider-crabs. In *Homola* the carapace is quadrilateral. Between these two a very interesting link was discovered by the "Challenger" in the species *Latreillopsis bispinosa*. Henderson. Bouvier (1896) has shown that *Palaeinachus longipes*, Woodward, from the Forest Marble of Wiltshire, is in close relationship, not to the oxyrhynch Inachidae, but to the genera *Homolodromia* and *Dicranodromia* of the Homolodromiidae, and that the Jurassic crabs in general, of the family Prosoponidae (Meyer), are Dromiidea.

2. Macrura.—The *Macrura anomala*, or Anomura in restricted sense, are popularly known through the hermit-crabs alone. These only partially represent one of the three main divisions, Paguridea, Galatheidea,

Hippidea. The first of these is subdivided into *Pagurinea*, *Lithodinea*, *Lomisinea*, each with a literature of its own. Among the Pagurinea is the *Birgus latro*, or robber-crab, whose expertness in climbing the coco-nut palm need no longer be doubted, since in recent years it has been noted and photographed by trustworthy naturalists in the very act. Alcock "observed one of these crabs drinking from a runnel of rain-water, by dipping the fingers of one of its chelipeds into the water and then carrying the wet fingers to its mouth." Hermits of the genus *Coenobita* he found feeding voraciously on nestling sea-terns. That pagurids must have the usually soft pleon or abdomen protected by the shell of a mollusc is now known to be subject to a multitude of exceptions. *Birgus* dispenses with a covering; *Coenobita* can make shift with half the shell of a coco-nut; *Chlaenopagurus* wraps itself up in a blanket of colonial polyps; *Cancellus tanneri*, Faxon, was found in a piece of dead coral rock; *Xylopagurus rectus*, A. Milne-Edwards, lodges in tubes of timber or bits of hollow reed. The last-named species has a straight symmetrical abdomen, with the penultimate segment expanded and strongly calcified to form a back-door to the very unconventional habitation. This it enters head-foremost from the rear, while "hermits" in general are forced to go backwards into their spiral or tapering shelters by the front. Some of the species can live in the ocean at a depth of two or three miles. Some can range inland up to a considerable height on mountains. The advantage that this group has derived from the adoption of mollusc shells as houses or fortresses, ready built and light enough for easy transport, is obviously discounted by a twofold inconvenience. There is nothing to ensure that the supply will be equal to the demand, and Nature has not arranged that the borrowed tenement shall continue to grow with the growth of its new tenant. To meet these defects it is found that numerous species encourage or demand the companionship of various zoophytes, simple or colonial. These sometimes completely absorb the shell on which they are settled, but then act as a substitute for it, and in any case by their outgrowth they extend the limits of the dwelling, so that the inmate can grow in comfort without having to hunt or fight for a larger abode. Among the *Lithodinea*, or stone crabs, besides important readjustments of classification (Bouvier, 1895, 1896), should be noticed the evidence of their cosmopolitan range, and the species *Neolithodes agassizii* (Smith) and *N. grimaldii*, Milne-Edwards and Bouvier, which carry to an extreme the spinosity characteristic of the group (fig. 1). S. I. Smith's investigations on the early stages of *Hippa talpoida*, Say, were published in 1877.

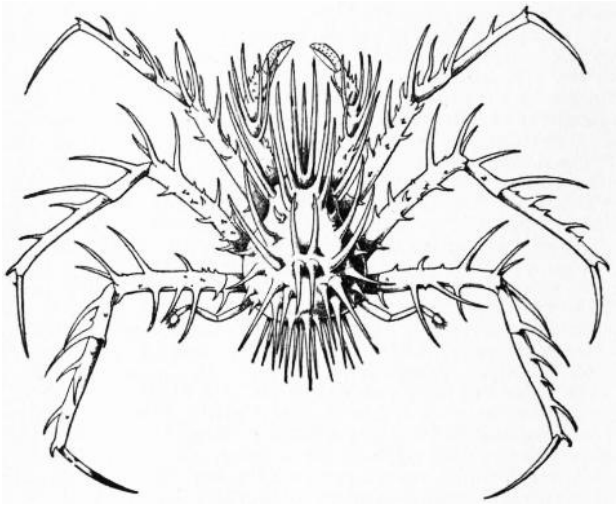

FIG. 1.—*Neolithodes grimaldii*, A. Milne-Edwards and Bouvier.

With regard to the accessions to knowledge in the enormous group of the genuine Macrura, reference need only be made to the extensive reports in which Spence Bate, S. I. Smith, Faxon, Wood-Mason, Alcock, and others have made known the results of celebrated explorations. Various larval stages have been successfully investigated by Sars. Alcock (1901) describes from his own observation the newly hatched *Phyllosoma* larva of *Thenus orientalis*, Fabricius. An admirable discrimination of the larval and adult characters of the genus *Sergestes* has been given by H. J. Hansen (*Proc. Zool. Soc.*, London, 1896). Singularity excites our wonder in *Thaumastocheles zaleucus*, v. Willemoes Suhm, which makes up for its vanished eyes by its extraordinarily elongate and dentated claws; in *Psalidopus huxleyi*, Wood-Mason and Alcock (1892), bristling with spikes from head to tail; in the Nematocarcinidae, with their long thread-like limbs and longer antennae; in species of *Aristaeopsis* reported by Chun from deep water off the east coast of Africa, bright red prawns nearly a foot long, with antennae about five times the length of the body. That certain species, particularly many from deep water, have disproportionately large eggs, is explained by the supposition that the young derive the advantage of being hatched in an advanced stage of development.

3. SCHIZOPODA.—This order of animals for the most part delicately beautiful, has for the moment five families—Lophogastridae, Eucopiidae, Euphausiidae, Mysidae and Anaspididae. In the Euphausiidae the digitiform-arborescent branchiae, as if conscious of their own extreme elegance, remain wholly uncovered. In the two preceding families they are partially covered. In the Mysidae the branchiae are wanting, and some would form this family into a separate order, Mysidacea. In *Anaspides*, a peculiar fresh-water genus discovered in 1892 by G. M. Thomson on Mount Wellington, in Tasmania, the gills are not arborescent, and there are seven segments of the trunk free of the carapace (fig. 2). A membranaceous carapace separates the Eucopiidae from the more solidly invested Lophogastridae. Among many papers that the student will find it necessary to consult may be mentioned the "*Challenger*" *Report* on Schizopoda, by Sars, 1885, dealing with the order at large; "British Schizopoda," by Norman *Ann. Nat. Hist.* (1892); "Decapoden und Schizopoden," *Plankton-Expedition* (Ortmann, 1893); "Euphausiidae," by Stebbing, *Proc. Zool. Soc.* (London, 1900); *Mysidae of the Russian Empire*, by Czerniavski (1882-1883); and *Mysidae of the Caspian*, by Sars (1893-1895-1897).

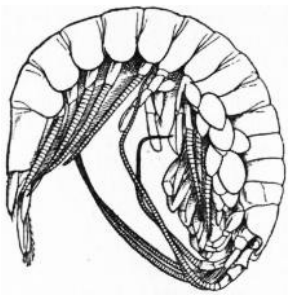

FIG. 2.—*Anaspides tasmaniae*, Thomson.

4. STOMATOPODA.—This order, at one time a medley of heterogeneous forms, is now confined to the singularly

compact group of the Squillidae. Here the articulation of the ocular segment is unusually distinct, and here two characters quite foreign to all the preceding groups come into view. The second maxillipeds are developed into powerful prehensile organs, and the branchiae, instead of being connected with the appendages of head and trunk, are developed on the pleopods, appendages of the abdomen. At least three segments of the trunk are left uncovered by the carapace. The developing eggs are not carried about by the mother, but deposited in her subaqueous burrow, "where they are aerated by the currents of water produced by the abdominal feet of the parent." An excellent synopsis of the genera and species is provided by R. P. Bigelow (*Proc. U.S. Mus.* vol. xvii., 1894). For the habits and peculiarities of these and many other Crustaceans, A. E. Verrill and S. I. Smith on the *Invertebrates of Vineyard Sound* should be consulted (1874). The general subject has been illuminated by the labours of Claus, Miers, Brooks (*"Challenger" Report*, 1886), and the latest word on the relationship between the various larvae and their respective genera has been spoken by H. J. Hansen (*Plankton-Expedition Report*, 1895). The striking forms of *Alima* and *Erichthus*, at one time regarded as distinct genera, are now with more or less certainty affiliated to their several squillid parents.

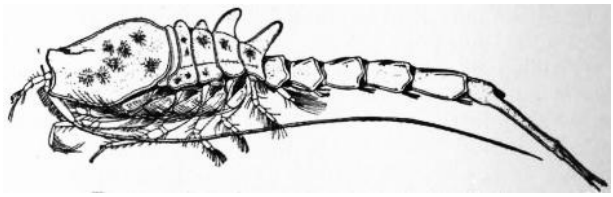

Fig. 3.—*Pseudocuma pectinatum*, Sowinsky.

5. Sympoda.—This order of sessile-eyed decapods was absolutely unknown to science till 1779. A species certainly belonging to it was described by Lepekhin in 1780, but the obscure *Gammarus esca*, "food Gammarus" beloved of herrings, described by J. C. Fabricius in the preceding year, may also be one of its members. Nutritious possibilities are implied in *Diastylis rathkii*, Kröyer, one of the largest forms, which, though slender and rarely an inch long, in its favourite Arctic waters is found "in incalculable masses, in thousands of specimens" (Stuxberg, 1880). Far on in the 19th century eminent naturalists were still debating whether in this group there were eyes or no eyes, whether the eyes were stalked or sessile, whether the animals observed were larval or adult. The American T. Say in 1818 gave a good description of a new species and founded the premier genus *Diastylis*, but other investigators derived little credit from the subject till more than sixty years after its introduction by the Russian Lepekhin. Then Goodsir, Kröyer, Lilljeborg, Spence Bate and one or two others made considerable advances, and in 1865 a memorable paper by G. O. Sars led the way to the great series of researches which he has continued to the present day. The name *Cumacea*, however, which he uses cannot be retained, being founded on the preoccupied name *Cuma* (Milne-Edwards, 1828). The more recent name *Sympoda* (see Willey, *Results*, pt. v. p. 609, 1900) alludes to the huddling together of the legs, which is conspicuous in most of the species. Ten families are now distinguished—Diastylidae, Lampropidae, Platyaspidae, Pseudocumidae, all with an articulated telson; without one, the Bodotriidae (formerly called *Cumidae*), Vaunthompsoniidae, Leuconidae, Nannastacidae, Campylaspidae, Procampylaspidae. All the Leuconidae and Procampylaspidae are blind, and some species in most of the other families. Usually the sides of the carapace are strangely produced into a mock rostrum in front of the ocular lobe, be it oculiferous or not. The last four or five segments of the trunk are free from the carapace. The slender pleon has always six distinct segments, the sixth carrying two-branched uropods, the preceding five armed with no pleopods in the female, whereas in the male the number of pairs varies from five to none. The resemblance of these creatures to miniature Macrura is alluded to in the generic name *Nannastacus*, meaning dwarf-lobster. In this genus alone of the known Sympoda the eyes sometimes form a pair, in accordance with the custom of all other malacostracan orders except this and of this order itself in the embryo (Sars, 1900). The most but not the only remarkable character lies in the first maxillipeds. These, with the main stem more or less pediform, have the epipod and exopod modified for respiratory purposes. The backward-directed epipods usually carry branchial vesicles. The forward-directed exopods either act as valves or form a tube (rarely two tubes), protensile and retractile, for regulating egress of water from the branchial regions. This mechanism as a whole is unique, although, as Sars observes, the epipod of the first maxillipeds has a respiratory function also in the Lophogastridae and Mysidae and in the cheliferous isopods. As a rule armature of the carapace is much more developed in the comparatively sedentary female than in the usually more active male. Only in the male do the second antennae attain considerable length, with strong resemblance to what is found in some of the Amphipoda. About 150 species distributed among thirty-four genera are now known, many from shallow water and from between tide-marks, some from very great depths. H. J. Hansen concludes that "they are all typically ground animals, and as yet no species has been taken under such conditions that it could be reckoned to the pelagic plankton." As they have been found in all zones and chiefly by a very few observers, it is probable that a great many more species remain to be discovered. In recent years thirteen species, all belonging to the same genus *Pseudocuma* (fig. 3), have been recorded by Sars from the Caspian Sea. A bibliography of the order is given in that author's *Crustacea of Norway*, vol. iii. (1899-1900).

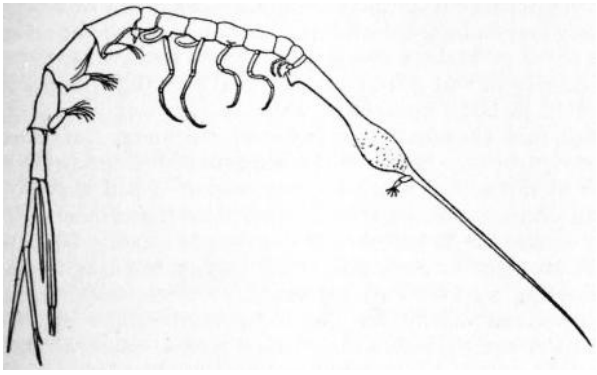

Fig. 4.—*Rhabdosoma piratum*, Stebbing.

6. Isopoda.—This vast and populous order can be traced far back in geological time. It is now represented in all seas and lands, in fresh-water lakes and streams, and even in warm springs. It adapts itself to parasitic life not only in fishes, but in its own class Crustacea, and that in species of every order, its own included. In this process changes of structure are apt to occur, and sometimes unimaginable sacrifices of the normal appearance. The order has been divided into seven tribes, of which a fuller summary than can here be given will be found in Stebbing, *History of Crustacea* (1893). The first tribe, called Chelifera, from the usually chelate or claw-bearing first limbs, may be regarded as *Isopoda anomala*, of which some authors would form a separate order, Tanaidea. Like the genuine isopods, they have seven pairs of trunk-legs, but instead of having seven segments of the middle body (or peraeon) normally free, they have the first one or two of its segments coalesced with the head. Instead of the breathing organs being furnished by the appendages of the pleon with the heart in their vicinity, the respiration is controlled by the maxillipeds, with the heart in the peraeon (see Delage, *Arch. Zool. expér. et gén.*, vol. ix., 1881). There are two families, Tanaidae and Apseudidae. Occasionally the ocular lobes are articulated.

The genuine Isopoda are divided among the *Flabellifera*, in which the terminal segment and uropods form a flabellum or swimming fan; the *Epicaridea*, parasitic on Crustaceans; the *Valvifera*, in which the uropods fold valve-like over the branchial pleopods; the *Asellota*, in which the first pair of pleopods of the female are usually transformed into a single opercular plate; the *Phreatoicidea*, a fresh-water tribe, known as yet only from subterranean waters in New Zealand and an Australian swamp nearly 6000 ft. above sea-level; and lastly, the *Oniscidea*, which are terrestrial. Only the last of these, under the contemptuous designation of wood-lice, has established a feeble claim to popular recognition. Few persons hear without surprise that England itself possesses more than a score of species in this air-breathing tribe. Those known from the world at large number hundreds of species, distributed among dozens of genera in six families. That a wood-louse and a land-crab are alike Malacostracans, and that they have by different paths alike become adapted to terrestrial life, are facts which even a philosopher might condescend to notice. Of the other tribes which are aquatic there is not space to give even the barest outline. Their swarming multitudes are of enormous importance in the economy of the sea. If in their relation to fish it must be admitted that many of them plague the living and devour the dead, in return the fish feed rapaciously upon them. Among the most curious of recent discoveries is that relating to some of the parasitic *Cymothoidae*, as to which Bullar has shown that the same individual can be developed first as a male and then as a female. Of lately discovered species the most striking is one of the deep-sea Cirolanidae, *Bathynomus giganteus*, A. M. Edwards (1879), which is unique in having supplementary ramified branchiae developed at the bases of the pleopods. Its eyes are said to contain nearly 4000 facets. The animal attains what in this order is the monstrous size of 9 in. by 4. A general uniformity of the trunk-limbs in Isopoda justifies the ordinal name, but the valviferous Astacillidae, and among the Asellota the Munnopsidae, offer some remarkable exceptions to this characteristic. Among many essential works on this group may be named the *Monogr. Cymothoarum* of Schiödte and Meinert (1879-1883); "*Challenger*" *Report*, Beddard (1884-1886); *Cirolanidae*, H. J. Hansen (1890); *Isopoda Terrestria*, Budde-Lund (1885); *Bopyridae*, Bonnier (1900); *Crustacea of Norway*, vol. ii. (Isopoda), Sars (1896-1899), while their multitude precludes specification of important contributions by Benedict, Bovallius, Chilton, Dohrn, Dollfus, Fraisse, Giard and Bonnier, Harger, Haswell, Kossmann, Miers, M'Murrich, Norman, Harriet Richardson, Ohlin, Studer, G. M. Thomson, A. O. Walker, Max Weber and many others.

7. Amphipoda.—As in the genuine Isopoda, the eyes of Amphipoda are always sessile, and generally paired, and, in contrast to crabs and lobsters, these two groups have only four pairs of mouth-organs instead of six, but seven pairs of trunk-legs instead of five. From the above-named isopods the present order is strongly differentiated by having heart and breathing organs not in the pleon, but in the peraeon, or middle body, the more or less simple branchial vesicles being attached to some or all of the last six pairs of trunk-legs. Normally the pleon carries six pairs of two-branched appendages, of which the first three are much articulated flexible swimming feet, the last three few-jointed comparatively indurated uropods. There are three tribes, *Gammaridea*, *Caprellidea*, *Hyperiidea*. The middle one contains but two families, the cylindrical and often thread-like skeleton shrimps, Caprellidae, and their near cousins, the broad, flattened, so-called whale-lice, Cyamidae. This tribe has the pleon dwindled into insignificance, whereas in the other two tribes it is powerfully developed. The Hyperiidea are distinguished by having their maxillipeds never more than three-jointed. In the companion tribes these appendages have normally seven joints, and always more than three. The order thus sharply divided is united by an intimate interlacing of characters, and forms a compact whole at present defying intrusion from any other crustacean group. Since 1775, when J. C. Fabricius instituted the genus *Gammarus* for five species, of which only three were amphipods, while he left five other amphipods in the genus *Oniscus*, from this total of eight science has developed the order, at first very slowly, but of late by great leaps and bounds, so that now the *Gammaridea* alone comprise more than 1300 species, distributed among some 300 genera and 39 families. They burrow in the sands of every shore; they throng the weeds between tide-marks; they ascend all streams; they are found in deep wells, in caverns, in lakes; in Arctic waters they swarm in numbers beyond computation; they find lodgings on crabs, on turtles, on weed-grown buoys; they descend into depths of the ocean down to hundreds or thousands of fathoms; they are found in mountain streams as far above sea-level as some of their congeners live below it. The Talitridae, better known as sandhoppers, can forgo the briny shore and content themselves with the damp foliage of inland forests or casual humidity in the crater of an extinct volcano. Over the ocean surface, as well as at various depths, float and swim innumerable *Hyperiidea*—the wonderful *Phronima*, glass-like in its glassy barrel hollowed out of some Tunicate; the *Cystisoma*, 4 or 5 in. long, with its eye-covered head; the *Rhabdosoma*, like a thin rod of glass, with needle-like head and tail, large eyes, but limbs and mouth-organs all in miniature, and the second antennae of the male folding up like a carpenter's rule (fig. 4). On jelly-fishes are to be found species of *Hyperia* and their kindred, so fat and wholesome that they have been commended to shipwrecked men in open boats as an easily procurable resource against starvation. Many of the Amphipoda are extremely voracious. Some of them are even cannibals. The Cyamidæ afflict the giant whale by nibbling away its skin; the *Chelura terebrans* is destructive to submerged timber. But, on the other hand, they largely help to clear the sea and other waters of refuse and carrion, and for fishes, seals and whales they are food desirable and often astoundingly copious. From the little flea-like species, scarcely a tenth of an inch long, up to the great and rare but cosmopolitan *Eurythenes gryllus*, Lichtenstein, and the still larger *Alicella gigantea*, Chevreux, nearly half a foot long, captured by the prince of Monaco from a depth of 2936 fathoms, not one of these ubiquitous, uncountable hordes has ever been accused of assailing man. For the naturalist they have the recommendation that many are easy to obtain, that most, apart from the very minute, are easy to handle, and that all, except as to the fleeting colours, are easy to preserve.

A nearly complete bibliography of the order down to 1888 will be found in the "*Challenger*" *Reports*, vol. xxviii., and supplementary notices in Della Valle's *Monograph of the Gammarini* (1893), the scope of his work, however, not covering the Hyperiidea and Oxycephalidae of Bovallius (1889, 1890); but since these dates very numerous additions to the literature have been made by Birula, Bonnier, Norman, Walker and others, especially the *Crustacea of Norway*, vol. i. (*Amphipoda*), Sars (1890-1895), demanding attention, and the quite recent *Amphipoda of the Hirondelle*, Chevreux (1900), and *Hyperiidea of the Plankton-Expedition*, Vosseler (1901).

(T. R. R. S.)

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1 In Huxley's terminology the first two or three joints of the stem constitute a "protopodite," from which spring the "endopodite" and "exopodite."

MALAGA, a maritime province of southern Spain, one of the eight modern subdivisions of Andalusia; bounded on the W. by Cadiz, N. by Seville and Cordova, E. by Granada, and S. by the Mediterranean Sea. Pop. (1900), 511,989; area, 2812 sq. m. The northern half of Malaga belongs to the great Andalusian plain watered 460
by the Guadalquivir, the southern is mountainous, and rises steeply from the coast. Of the numerous sierras may be mentioned that of Alhama, separating the province from Granada, and at one point rising above 7000 ft.; its westward continuation in the Sierra de Abdalajis and the Axarquia between Antequera and Malaga; and not far from the Cadiz boundary the Sierras de Ronda, de Mijas, de Tolox and Bermeja, converging and culminating in a summit of nearly 6500 ft. The rivers which rise in the watershed formed by all these ranges reach the sea after a short and precipitous descent, and in rainy seasons are very liable to overflow their banks. In 1907 great loss of life and destruction of property were caused in this manner. The principal river is the Guadalhorce, which rises in the Sierra de Alhama, and, after a westerly course past the vicinity of Antequera, bends southward through the wild defile of Peñarrubia and the beautiful *vega* or vale of Malaga, falling into the sea near that city. The only other considerable stream is the Guadiaro, which has the greater part of its course within the province and flows past Ronda. There is an extensive salt lagoon near the northern boundary. The mountains are rich in minerals, lead, and (in the neighbourhood of Marbella) iron, being obtained in large quantities. There are warm sulphurous springs and baths at Carratraca. Though the methods of agriculture are for the most part rude, the yield of wheat in good seasons is considerably in excess of the local demand; and large quantities of grapes and raisins, oranges and lemons, figs and almonds, are annually exported. The oil and wines of Malaga are also highly esteemed, and after 1870 the manufacture of beet and cane sugar developed into an important industry. In 1905 there were about 500 flour mills and 230 oil factories beside 95 stills and 100 wine-presses in the province. Malaga has suffered severely from the agricultural depression prevalent throughout southern Spain, but its manufacturing industries tend to expand. The fisheries are important; a fleet of about 300 boats brings in 18,000,000 lb annually, of which 25% is exported. The internal communications are in many parts defective, owing to the broken nature of the surface; but the province is traversed from north to south by the Cordova-Malaga railway, which sends off branches from Bobadilla to Granada and Algeciras. A branch line along the coast from Malaga to Vélez Malaga was opened in 1908.

Malaga, the capital (pop. 130,109), Antequera (31,609), Vélez Malaga (23,586), Ronda (20,995), Coín (12,326), and Alora (10,325), are described in separate articles. Other towns with more than 7000 inhabitants are Marbella (9629), Estepona (9310), Archidona (8880) and Nerja (7112). The population of the province tends gradually to decrease, as many families emigrate to South America, Algeria and Hawaii.

MALAGA, the capital of the province of Malaga, an episcopal see, and, next to Barcelona, the most important seaport of Spain, finely situated on the Mediterranean coast, at the southern base of the Axarquia hills and at the eastern extremity of the fertile vega (plain) of Malaga in 36° 43′ N. and 4° 25′ W. Pop. (1900), 130,109. From the clearness of its sky, and the beautiful sweep of its bay, Malaga has sometimes been compared with Naples. The climate is one of the mildest and most equable in Europe, the mean annual temperature being 66.7° Fahr. The principal railway inland gives access through Bobadilla to all parts of Spain, and a branch line along the coast to Vélez-Malaga was opened in 1908. Malaga lies principally on the left bank of a mountain torrent, the Guadalmedina ("river of the city"); the streets near the sea are spacious and comparatively modern, but those in the older part of the town, where the buildings are huddled around the ancient citadel, are narrow, winding and often dilapidated. Well-built suburbs have also spread on all sides into the rich and pleasant country which surrounds Malaga, and several acres of land reclaimed from the sea have been converted into a public park. There are various squares or plazas and public promenades; of the former the most important are the Plaza de Riego (containing the monument to General José Maria Torrijos, who, with forty-eight others, was executed in Malaga on the 11th of December 1831, for promoting an insurrection in favour of the constitution) and the Plaza de la Constitucion; adjoining the quays is the fine Paseo de la Alameda. The city has no public buildings of commanding architectural or historical importance. The cathedral, on the site of an ancient mosque, was begun about 1528; after its construction had been twice interrupted, it was completed to its present state in the 18th century, and is in consequence an obtrusive record of the degeneration of Spanish architecture. The woodwork of the choir, however, is worthy of

attention. The church of El Cristo de la Victoria contains some relics of the siege of 1487. There are an English church and an English cemetery, which dates from 1830; up to that year all Protestants who died in Malaga were buried on the foreshore, where their bodies were frequently exposed by the action of wind and sea. Of the old Moorish arsenal only a single horseshoe gateway remains, the rest of the site being chiefly occupied by an iron structure used as a market; the Alcazába, or citadel, has almost disappeared. The castle of Gibralfaro, on a bold eminence to the north-east dates from the 13th century, and is still in fairly good preservation.

During the 19th century so much silt accumulated in the harbour that vessels were obliged to lie in the roads outside, and receive and discharge cargo by means of lighters; but new harbour works were undertaken in 1880, and large ships can now again load or discharge at the quays, which are connected with the main railway system by a branch line. About 2150 ships of 1,750,000 tons enter at Malaga every year. Iron, lead, wine, olive oil, almonds, fresh and dried fruit, palmetto hats and canary seed are exported in large quantities, while the imports include grain, codfish, fuel, chemicals, iron and steel, machinery, manures and staves for casks. Although trade was impeded during the early years of the 20th century by a succession of bad harvests and by the disastrous floods of September 1907, the number of industries carried on in and near Malaga tends steadily to increase. There are large cotton mills, iron foundries, smelting works and engineering works. Pottery, mosaic, artificial stone and tiles are produced chiefly for the home market, though smaller quantities are sent abroad. There is a chromo-lithographic establishment, and the other industries include tanning, distilling and the manufacture of sugar, chocolate, soap, candles, artificial ice, chemical products, white lead and pianos. Foreign capital has played a prominent part in the development of Malaga; a French syndicate owns the gas-works, and the electric lighting of the streets is controlled by British and German companies.

Malaga is the Μάλακα of Strabo (iii. 156) and Ptolemy (ii. 4, 7) and the *Malaca foederatorum* of Pliny (iii. 3). The place seems to have been of some importance even during the Carthaginian period; under the Romans it became a municipium, and under the Visigoths an episcopal see. In 711 it passed into the possession of the Moors, and soon came to be regarded as one of the most important cities of Andalusia. It was attached to the caliphate of Cordova, but on the fall of the Omayyad dynasty it became for a short time the capital of an independent kingdom; afterwards it was dependent on Granada. In 1487 it was taken and treated with great harshness by Ferdinand and Isabella after a protracted siege. In 1810 it was sacked by the French under General Sebastiani. The citizens of Malaga are noted for their opposition to the Madrid government; they took a prominent part in the movements against Espartero (1843), against Queen Isabella (1868) and in favour of a republic (1873).

MALAKAND PASS, a mountain pass in the North-West Province of India, connecting the British district of Peshawar with the Swat Valley. It is now a military post and the headquarters of a political agency. It came into prominence for the first time in 1895 during the Chitral campaign, when 7000 Pathans held it against Sir Robert Low's advance, but were easily routed. After the campaign was over a fortified camp was formed on the Malakand to guard the road to Chitral. During the frontier risings of 1897 the Swatis made a determined attack on the Malakand, where 700 were killed, and on the adjacent post of Chakdara, where 2000 were killed. This was the origin of the Malakand Expedition of the same year. (See Swat.)

MALALAS (or Malelas) (Syriac for "orator"), **JOHN** (*c.* 491-578), Byzantine chronicler, was born at Antioch. He wrote a Χρονογραφία in 18 books, the beginning and the end of which are lost. In its present state it begins with the mythical history of Egypt and ends with the expedition to Africa under Marcianus, the nephew of Justinian. Except for the history of Justinian and his immediate predecessors, it possesses little historical value; it is written without any idea of proportion and contains astonishing blunders. The writer is a supporter of Church and State, an upholder of monarchical principles. The work is rather a chronicle written round Antioch, which he regarded as the centre of the world, and (in the later books) round Constantinople. It is, however, important as the first specimen of a chronicle written not for the learned but for the instruction of the monks and the common people, in the language of the vulgar, with an admixture of Latin and Oriental words. It obtained great popularity, and was conscientiously exploited by various writers until the 11th century, being translated even into the Slavonic languages. It is preserved in an abridged form in a single MS. now at Oxford.

For the authorities consulted by Malalas, the influence of his work on Slavonic and Oriental literature, the state of the text, the original form and extent of the work, the date of its composition, the relation of the concluding part to the whole, and the literature of the subject, see C. Krumbacher's *Geschichte der byzantinischen Litteratur* (1897). See also the *editio princeps*, by E. Chilmead (Oxford, 1691), containing an essay by Humphrey Hody and Bentley's well-known letter to Mill; other editions in the Bonn *Corpus scriptorum hist. byz.*, by L. Dindorf (1831), and in J. P. Migne *Patrologia graeca*, xcvii.

MALAN, SOLOMON CAESAR (1812-1894), British divine and orientalist, was by birth a Swiss descended from an exiled French family, and was born at Geneva on the 22nd of April 1812, where his father, Dr Henry Abraham Caesar Malan (1787-1864) enjoyed a great reputation as a Protestant divine. From his earliest youth he manifested a remarkable faculty for the study of languages, and when he came to Scotland as tutor in the marquis of Tweeddale's family at the age of 18 he had already made progress in Sanskrit, Arabic and Hebrew. In 1833 he matriculated at St Edmund Hall, Oxford; and English being almost an unknown tongue to him, he petitioned the examiners to allow him to do his paper work of the examination in French, German, Spanish, Italian, Latin or Greek, rather than in English. But his request was not granted. After gaining the Boden and the Pusey and Ellerton scholarships, he graduated 2nd class in *Lit. hum.* in 1837. He then proceeded to India as classical lecturer at Bishop's College, Calcutta, to which post he added the duties of secretary to the Bengal branch of the Royal Asiatic Society; and although compelled by illness to return in 1840, laid the foundation of a knowledge of Tibetan and Chinese. After serving various curacies, he was presented in 1845 to the living of Broadwindsor, Dorset, which he held until 1886. During this entire period he continued to augment his linguistic knowledge, which he carried so far as to be able to preach in that most difficult language, Georgian, on a visit which he paid to Nineveh in 1872. His translations from the Armenian, Georgian and Coptic were numerous. He applied his Chinese learning to the determination of important points connected with Chinese religion, and published a vast number of parallel passages illustrative of the Book of Proverbs. In 1880 the university of Edinburgh conferred upon him the honorary degree of D.D. No modern scholar, perhaps, has so nearly approached the linguistic omniscience of Mezzofanti; but, like Mezzofanti, Dr Malan was more of a linguist than a critic. He made himself conspicuous by the vehemence of his opposition to Westcott and Hort's text of the New Testament, and to the transliteration of Oriental languages, on neither of which points did he in general obtain the suffrages of scholars. His extensive and valuable library, some special collections excepted, was presented by him in his lifetime to the Indian Institute at Oxford. He died at Bournemouth on the 25th of November 1894. His life has been written by his son.

MÄLAR, a lake of Sweden, extending 73 m. westward from Stockholm, which lies at its junction with the Saltsjö, an arm of the Baltic Sea. The height of the lake is normally only from 11 in. to 2 ft. above sea-level, and its outflow is sometimes reversed. The area is 449 sq. m. The bottom consists of a series of basins separate by ridges from which rise numerous islands. The deepest sounding is 210 ft. The outline is very irregular, the mean breadth being about 15 m., but an arm extends northward for 30 m. nearly to the city of Upsala with many ramifications. The area of the drainage basin is 8789 sq. m., of which 1124 are occupied by lakes. The navigable connexions with the lake are—(1) with lake Hjelmar to the south-west by the Arboga river and the Hjelmar canal; and by the Eskilstuna river and the Thorshälla canal; (2) with the Baltic southward through the Södertelge canal, the route followed by the Göta canal steamers; (3) with the Baltic by two channels at Stockholm. The more important towns, besides Stockholm, are Vesterås on the north, Södertelge and Eskilstuna near the south shore. The lake offers a field for recreation fully appreciated by the inhabitants of the capital, and many of those whose business lies at Stockholm have their residences on the shores of Mälar. On Drottningholm (Queen's Island, named from Catherine, wife of John III.) is a palace with a fine park and formal gardens. John III. built a palace at the close of the 16th century, but the existing building, by Nicodemus Tessin and his son Nicodemus, dates from the second half of the 17th century. At Mariefred on the south shore there is the castle of Gripsholm (1537), built by Gustavus Vasa, a picturesque erection with four towers, richly adorned within, and containing a large collection of portraits. Strengnäs, on the same shore, became an episcopal see in 1291, when the fine cathedral, much altered since, was consecrated. In the episcopal palace, a building of the 15th century now used as a school, Gustavus Vasa was elected to the throne of Sweden in 1523. On the northward arm of the lake is the palace of Rosenberg, used as a school of gunnery, in a well-wooded park. On a branch of the same arm is Sigtuna, a village whose ruined churches are a memorial of its rank among the principal towns of Sweden after its foundation in the 11th century. Remains prove that on Björkö, an island in the eastern part of the lake, there was a large settlement of earlier importance than Sigtuna. Here a cross commemorates the preaching of Christianity by St Ansgar in 829. Finally, on the northern arm about 10 m. south of Upsala, there is the château of Skokloster, occupying the site of a monastery, and presented by Gustavus Adolphus to Marshal Herman Wrangel, whose son Charles Gustavus Wrangel stored it with a remarkable collection of trophies from Germany, taken during the Thirty Years' War; including a library, an armoury, and a great accumulation of curios.

MALARIA, an Italian colloquial word (from *mala*, bad, and *aria*, air), introduced into English medical literature by Macculloch (1827) as a substitute for the more restricted terms "marsh miasm" or "paludal poison." It is generally applied to the definite unhealthy condition of body known by a variety of names, such as ague, intermittent (and remittent) fever, marsh fever, jungle fever, hill fever, "fever of the country" and "fever and ague." A single paroxysm of simple ague may come upon the patient in the midst of good health or

it may be preceded by some malaise. The ague-fit begins with chills proceeding as if from the lower part of the back, and gradually extending until the coldness overtakes the whole body. Tremors of the muscles more or less violent accompany the cold sensations, beginning with the muscles of the lower jaw (chattering of the teeth), and extending to the extremities and trunk. The expression has meanwhile changed: the face is pale or livid; there are dark rings under the eyes; the features are pinched and sharp, and the whole skin shrunken; the fingers are dead white, the nails blue.

All those symptoms are referable to spasmodic constriction of the small surface arteries, the pulse at the wrist being itself small, hard and quick. In the interior organs there are indications of a compensating accumulation of blood, such as swelling of the spleen, engorgement (very rarely rupture) of the heart, with a feeling of oppression in the chest, and a copious flow of clear and watery urine from the congested kidneys. The body temperature will have risen suddenly from the normal to 103° or higher. This first or cold stage of the paroxysm varies much in length; in temperate climates it lasts from one to two hours, while in tropical and subtropical countries it may be shortened. It is followed by the stage of dry heat, which will be prolonged in proportion as the previous stage is curtailed. The feeling of heat is at first an internal one, but it spreads outwards to the surface and to the extremities; the skin becomes warm and red, but remains dry; the pulse becomes softer and more full, but still quick; and the throbbings occur in exposed arteries, such as the temporal. The spleen continues to enlarge; the urine is now scanty and high-coloured; the body temperature is high, but the highest temperatures occur during the chill; there is considerable thirst; and there is the usual intellectual unfitness, and it may be confusion, of the feverish state. This period of dry heat, having lasted three or four hours or longer, comes to an end in perspiration, at first a mere moistness of the skin, passing into sweating that may be profuse and even drenching. Sleep may overtake the patient in the midst of the sweating stage, and he awakes, not without some feeling of what he has passed through, but on the whole well, with the temperature fallen almost or altogether to the normal, or it may be even below the normal; the pulse moderate and full; the spleen again of its ordinary size; the urine that is passed after the paroxysm deposits a thick brick-red sediment of urates. The three stages together will probably have lasted six to twelve hours. The paroxysm is followed by a definite interval in which there is not only no fever, but even a fair degree of bodily comfort and fitness; this is the intermission of the fever. Another paroxysm begins at or near the same hour next day (quotidian ague), which results from a double tertian infection, or the interval may be forty-eight hours (tertian ague), or seventy-two hours (quartan ague). It is the general rule, with frequent exceptions, that the quotidian paroxysm comes on in the morning, the tertian about noon, and the quartan in the afternoon. Another rule is that the quartan has the longest cold stage, while its paroxysm is shortest as a whole; the quotidian has the shortest cold stage and a long hot stage, while its paroxysm is longest as a whole. The point common to the various forms of ague is that the paroxysm ceases about midnight or early morning. Quotidian intermittent is on the whole more common than tertian in hot countries; elsewhere the tertian is the usual type, and quartan is only occasional.

If the first paroxysm should not cease within the twenty-four hours, the fever is not reckoned as an intermittent, but as a remittent.

> *Remittent* is a not unusual form of the malarial process in tropical and subtropical countries, and in some localities or in some seasons it is more common than intermittent. It may be said to arise out of that type of intermittent in which the cold stage is shortened while the hot stage tends to be prolonged. A certain abatement or remission of the fever takes place, with or without sweating, but there is no true intermission or interval of absolute apyrexia. The periodicity shows itself in the form of an exacerbation of the still continuing fever, and that exacerbation may take place twenty-four hours after the first onset, or the interval may be only half that period, or it may be double. A fever that is to be remittent will usually declare itself from the outset: it begins with chills, but without the shivering and shaking fit of the intermittent; the hot stage soon follows, presenting the same characters as the prolonged hot stage of the quotidian, with the frequent addition of bilious symptoms, and it may be even of jaundice and of tenderness over the stomach and liver. Towards morning the fever abates; the pulse falls in frequency, but does not come down to the normal; headache and aching in the loins and limbs become less, but do not cease altogether; the body temperature falls, but does not touch the level of apyrexia. The remission or abatement lasts generally throughout the morning; and about noon there is an exacerbation, seldom ushered in by chills, which continues till the early morning following, when it remits or abates as before. A patient with remittent may get well in a week under treatment, but the fever may go on for several weeks; the return to health is often announced by the fever assuming the intermittent type, or, in other words, by the remissions touching the level of absolute apyrexia. Remittent fevers (as well as intermittents) vary considerably in intensity; some cases are intense from the outset, or pernicious, with aggravation of all the symptoms—leading to stupor, delirium, collapse, intense jaundice, blood in the stools, blood and albumen in the urine, and, it may be, suppression of urine followed by convulsions. The severe forms of intermittent are most apt to occur in the very young, or in the aged, or in debilitated persons generally. Milder cases of malarial fever are apt to become dangerous from the complications of dysentery, bronchitis or pneumonia. Severe remittents (pernicious or bilious remittents) approximate to the type of yellow fever (*q.v.*), which is conventionally limited to epidemic outbreaks in western longitudes and on the west coast of Africa.

Of the mortality due to malarial disease a small part only is referable to the direct attack of intermittent, and chiefly to the fever in its pernicious form. Remittent fever is much more fatal in its direct attack. But probably the greater part of the enormous total of deaths set down to malaria is due to the *malarial cachexia*. The dwellers in a malarious region like the Terai (at the foot of the Himalayas) are miserable, listless and ugly, with large heads and particularly prominent ears, flat noses, tumid bellies, slender limbs and sallow complexions; the children are impregnated with malaria from their birth, and their growth is attended with aberrations from the normal which practically amount to the disease of rickets. The malarial cachexia that follows definite attacks of ague consists in a state of ill-defined suffering, associated with a sallow skin, enlarged spleen and liver, and sometimes with dropsy.

Causation.—From the time of Hippocrates onwards the malarial or periodical fevers have engaged the attention of innumerable observers, who have suggested various theories of causation, and have sometimes anticipated—vaguely, indeed, but with surprising accuracy—the results of modern research; but the true nature of the disease remained in doubt until the closing years of the 19th century. It has now been

demonstrated by a series of accurate investigations, contributed by many workers, that malaria is caused by a microscopic parasite in the blood, into which it is introduced by the bites of certain species of mosquito. (See Parasitic Diseases and Mosquitoes.)

History of Discovery.

The successive steps by which the present position has been reached form an interesting chapter in the history of scientific progress. The first substantial link in the actual chain of discovery was contributed in 1880 by Laveran, a French army surgeon serving in Algeria. On the 6th of November in that year he plainly saw the living parasites under the microscope in the blood of a malarial patient, and he shortly afterwards communicated his observations to the Paris Académie de Médecine. They were confirmed, but met with little acceptance in the scientific world, which was preoccupied with the claims of a subsequently discredited Bacillus malariae. In 1885 the Italian pathologists came round to Laveran's views, and began to work out the life history of his parasites. The subject has a special interest for Italy, which is devastated by malaria, and Italian science has contributed materially to the solution of the problem. The labours of Golgi, Marchiafava, Celli and others established the nature of the parasite and its behaviour in the blood; they proved the fact, guessed by Rasori so far back as 1846, that the periodical febrile paroxysm corresponds with the development of the organisms; and they showed that the different forms of malarial fever have their distinct parasites, and consequently fall into distinct groups, defined on an etiological as well as a clinical basis—namely, the mild or spring group, which includes tertian and quartan ague, and the malignant or "aestivo-autumnal" group, which includes a tertian or a semi-tertian and the true quotidian type. Three distinct parasites, corresponding with the tertian, quartan and malignant types of fever, have been described by Italian observers, and the classification is generally accepted; intermediate types are ascribed to mixed and multiple infections. So far, however, only half the problem, and from the practical point of view the less important half, had been solved. The origin of the parasite and its mode of introduction into the blood remained to be discovered. An old popular belief current in different countries, and derived from common observation, connected mosquitoes with malaria, and from time to time this theory found support in more scientific quarters on general grounds, but it lacked demonstration and attracted little attention. In 1894, however, Sir Patrick Manson, arguing with greater precision by analogy from his own discovery of the cause of filariasis and the part played by mosquitoes, suggested that the malarial parasite had a similar intermediate host outside the human body, and that a suctorial insect, which would probably be found to be a particular mosquito, was required for its development. Following up this line of investigation, Major Ronald Ross in 1895 found that if a mosquito sucked blood containing the parasites they soon began to throw out flagellae, which broke away and became free; and in 1897 he discovered peculiar pigmented cells, which afterwards turned out to be the parasites of aestivo-autumnal malaria in an early stage of development, within the stomach-wall of mosquitoes which had been fed on malarial blood. He further found that only mosquitoes of the genus *Anopheles* had these cells, and that they did not get them when fed on healthy blood. Then, turning his attention to the malaria of birds, he worked out the life-history of these cells within the body of the mosquito. "He saw that they increased in size, divided, and became full of filiform spores, then ruptured and poured out their multitudinous progeny into the body-cavity of their insect host. Finally, he saw the spores accumulate within the cells of the salivary glands, and discovered that they actually passed down the salivary ducts and along the grooved hypopharynx into the seat of puncture, thus causing infection in a fresh vertebrate host" (Sambon). To apply these discoveries to the malaria of man was an obvious step. In working out the details the Italian school have again taken a prominent part.

Experiment.

Thus we get a complete scientific demonstration of the causation of malaria in three stages: (1) the discovery of the parasite by Laveran; (2) its life-history in the human host and connexion with the fever demonstrated by the Italian observers; (3) its life-history in the alternate host, and the identification of the latter with a particular species of mosquito by Ross and Manson. The conclusions derived from the microscopical laboratory were confirmed by actual experiment. In 1898 it was conclusively shown in Italy that if a mosquito of the *Anopheles* variety bites a person suffering from malaria, and is kept long enough for the parasite to develop in the salivary gland, and is then allowed to bite a healthy person, the latter will in due time develop malaria. The converse proposition, that persons efficiently protected from mosquito bites escape malaria, has been made the subject of several remarkable experiments. One of the most interesting was carried out in 1900 for the London School of Tropical Medicine by Dr Sambon and Dr Low, who went to reside in one of the most malarious districts in the Roman Campagna during the most dangerous season. Together with Signor Terzi and two Italian servants, they lived from the beginning of July until the 19th of October in a specially protected hut, erected near Ostia. The sole precaution taken was to confine themselves between sunset and sunrise to their mosquito-proof dwelling. All escaped malaria, which was rife in the immediate neighbourhood. Mosquitoes caught by the experimenters, and sent to London, produced malaria in persons who submitted themselves to the bites of these insects at the London School of Tropical Medicine. Experiments in protection on a larger scale, and under more ordinary conditions, have been carried out with equal success by Professor Celli and other Italian authorities. The first of these was in 1899, and the subjects were the railwaymen employed on certain lines running through highly malarious districts. Of 24 protected persons, all escaped but four, and these had to be out at night or otherwise neglected precautions; of 38 unprotected persons, all contracted malaria except two, who had apparently acquired immunity. In 1900 further experiments gave still better results. Of 52 protected persons on one line, all escaped except two, who were careless; of 52 protected on another line, all escaped; while of 51 unprotected persons, living in alternate houses, all suffered except seven. Out of a total of 207 persons protected in these railway experiments, 197 escaped. In two peasants' cottages in the Campagna, protected with wire netting by Professor Celli, all the inmates—10 in number—escaped, while the neighbours suffered severely; and three out of four persons living in a third hut, from which protection was removed owing to the indifference of the inmates, contracted malaria. In the malarious islet of Asinara a pond of stagnant water was treated with petroleum and all windows were protected with gauze. The result was that the houses were free from mosquitoes and no malaria occurred throughout the entire season, though there had been 40 cases in the previous year. Eight Red Cross ambulances, each with a doctor and attendant, were sent into the most malarious parts of the Campagna in 1900. By living in protected houses and wearing gloves and veils at night all the staff escaped malaria except one or two attendants. These and other experiments, described by Dr Manson in the *Practitioner* for March 1900, confirming the laboratory evidence as they do,

leave no doubt whatever of the correctness of the mosquito-parasitic theory of malaria.

It is possible, though not probable, that malaria may also be contracted in some other way than by mosquito bite, but there are no well-authenticated facts which require any other theory for their explanation. The alleged occurrence of the disease in localities free from mosquitoes or without their agency is not well attested; its absence from other localities where they abound is accounted for by their being of an innocent species, or—as in England—free from the parasite. The old theory of paludism or of a noxious miasma exhaled from the ground is no longer necessary. The broad facts on which it is based are sufficiently accounted for by the habits of mosquitoes. For instance, the swampy character of malarial areas is explained by their breeding in stagnant water; the effect of drainage, and the general immunity of high-lying, dry localities, by the lack of breeding facilities; the danger of the night air, by their nocturnal habits; the comparative immunity of the upper storeys of houses, by the fact that they fly low; the confinement of malaria to well-marked areas and the diminution of danger with distance, by their habit of clinging to the breeding-grounds and not flying far. Similarly, the subsidence of malaria during cold weather and its seasonal prevalence find an adequate explanation in the conditions governing insect life. At the same time it should be remembered that many points await elucidation, and it is unwise to assume conclusions in advance of the evidence.

Parasites.

With regard to the parasites, which are the actual cause of malaria in man, an account of them is given under the heading of Parasitic Diseases, and little need be said about them here. They belong to the group of Protozoa, and, as already explained, have a double cycle of existence: (1) a sexual cycle in the body of the mosquito, (2) an asexual cycle in the blood of human beings. They occupy and destroy the red corpuscles, converting the haemoglobin into melanin; they multiply in the blood by sporulation, and produce accessions of fever by the liberation of a toxin at the time of sporulation (Ross). The number in the blood in an acute attack is reckoned by Ross to be not less than 250 millions. A more general and practical interest attaches to the insects which act as their intermediate hosts. These mosquitoes or gnats—the terms are synonymous—belong to the family *Culicidae* and the genus *Anopheles*, which was first classified by Meigen in 1818. It has a wide geographical distribution, being found in Europe (including England), Asia Minor, Burma, Straits Settlements, Java, China, Formosa, Egypt; west, south and Central Africa; Australia, South America, West Indies, United States and Canada, but is generally confined to local centres in those countries. About fifty species are recognized at present. It is believed that all of them may serve as hosts of the parasite. The species best known in connexion with malaria are *A. maculipennis* (Europe and America), *A. funestus* and *A. costales* (Africa). In colour *Anopheles* is usually brownish or slaty, but sometimes buff, and the thorax frequently has a dark stripe on each side. The wings in nearly all species have a dappled or speckled appearance, owing to the occurrence of blotches on the front margin and to the arrangement of the scales covering the veins in alternating light and dark patches (Austen). The genus with which *Anopheles* is most likely to be confounded is *Culex*, which is the commonest of all mosquitoes, has a world-wide distribution, and is generally a greedy blood-sucker. A distinctive feature is the position assumed in resting; *Culex* has a humpbacked attitude, while in *Anopheles* the proboscis, head and body are in a straight line, and in many species inclined at an angle to the wall, the tail sticking outwards. In the female of *Culex* the palpi are much shorter than the proboscis; in *Anopheles* they are of the same length. The wings in *Culex* have not the same dappled appearance. *Anopheles* is also a more slender insect, with a smaller head, narrower body and thinner legs. There are further differences in the other stages of life. Mosquitoes go through four phases: (1) ovum, (2) larva, (3) nympha, (4) complete insect. The ova of *Anopheles* are tiny black rod-shaped objects, which are deposited on the water of natural puddles, ponds, or slowly moving streams, by preference those which are well supplied with vegetation; they float, singly or attached to other objects or clustered together in patterns. They can live in brackish and even in sea water. The larva has no breathing-tube, and floats horizontally at the surface, except when feeding; it does not frequent sewage or foul water. The ova of *Culex*, on the other hand, are deposited in any stagnant water, including cesspools, drains, cisterns, or water collected in any vessel; they float in boat-shaped masses on the surface. The larva has a breathing-tube, and floats head downwards; when disturbed it wriggles to the bottom (Christy). Some observers maintain that *Anopheles* does not “sing,” like the common mosquito, and its bite is much less irritating. Only the females suck blood; the act is believed to be necessary for fertilization and reproduction. *Anopheles* rarely bites by day, and then only in dark places. In the daytime “the gorged females rest motionless on the walls and ceilings of rooms, choosing always the darkest situations for this purpose” (Austen). In temperate climates the impregnated females hibernate during the winter in houses, cellars, stables, the trunks of trees, &c., coming out to lay their eggs in the spring. The four phases are passed in thirty days in a favourable season, and consequently there are ordinarily four or five generations from April to September (Celli).

The most important question raised by the mosquito-parasitic theory of malaria is that of prevention. This may be considered under two heads: (1) individual prophylaxis; (2) administrative prevention on a large scale.

Prophylaxis.

(1) In the first place, common sense suggests the avoidance, in malarious countries, of unhealthy situations, and particularly the neighbourhood of stagnant water. Among elements of unhealthiness is next to be reckoned the proximity of native villages, the inhabitants of which are infected. In the tropics “no European house should be located nearer to a native village than half a mile” (Manson), and, since children are almost universally infected, “the presence of young natives in the house should be absolutely interdicted” (Manson). When unhealthy situations cannot be avoided, they may be rendered more healthy by destroying the breeding-grounds of mosquitoes in the neighbourhood. All puddles and collections of water should be filled in or drained; as a temporary expedient they may be treated with petroleum, which prevents the development of the larvae. When a place cannot be kept free from mosquitoes the house may be protected, as in the experiments in Italy, by wire gauze at the doors and windows. The arrangement used for the entrance is a wire cage with double doors. Failing such protection mosquito curtains should be used. Mosquitoes in the house may be destroyed by the fumes of burning sulphur or tobacco smoke. According to the experiments of Celli and Casagrandi, these are the most effective culicides; when used in sufficient quantity they kill mosquitoes in one minute. The same authorities recommend a powder, composed of larvicide (an aniline substance), chrysanthemum flowers, and valerian root, to be burnt in bedrooms. Anointing the skin with strong-smelling substances is of little use in the open air, but more effective in the house; turpentine appears to be the best. Exposure at night should be avoided. All these prophylactic measures are directed against mosquitoes. There remains the question of protection against the parasite.

Chills are recognized as predisposing both to primary infection and to relapses, and malnutrition is also believed to increase susceptibility; both should therefore be avoided. Then a certain amount of immunity may be acquired by the systematic use of quinine. Manson recommends five to ten grains once or twice a week; Ross recommends the same quantity every day before breakfast. There is some evidence that arsenic has a prophylactic effect. An experiment made on the railway staff at Bovino, a highly malarious district on the Adriatic, gave a striking result. The number of persons was 78, and they were divided into two equal groups of 39 each. One group was treated with arsenic, and of these 36 escaped altogether, while three had mild attacks; the remaining 39 who were not treated, all had fever. In a more extended experiment on 657 railwaymen 402 escaped. This was in 1889; but in spite of the encouraging results the use of arsenic does not appear to have made any further progress. Experiments in immunizing by sero-therapeutic methods have not as yet met with success.

Administrative Measures.

(2) Much attention has been directed in scientific circles to the possibility of "stamping out" epidemic malaria by administrative measures. The problem is one of great practical importance, especially to the British Empire. There are no data for estimating the damage inflicted by malaria in the British colonies. It is, indeed, quite incalculable. In Italy the annual mortality from this cause averages 15,000, which is estimated to represent two million cases of sickness and a consequent loss of several million francs. In British tropical possessions the bill is incomparably heavier. There is not only the heavy toll in life and health exacted from Europeans, but the virtual closing of enormous tracts of productive country which would otherwise afford scope for British enterprise. The "deadly" climates, to which so much dread attaches, generally mean malaria, and the mastery of this disease would be equivalent to the addition of vast and valuable areas to the empire. The problem, therefore, is eminently one for the statesman and administrator. A solution may be sought in several directions, suggested by the facts already explained. The existence of the parasite is maintained by a vicious interchange between its alternate hosts, mosquitoes and man, each infecting the other. If the cycle be broken at any point the parasite must die out, assuming that it has no other origin or mode of existence. The most effective step would obviously be the extermination of the *Anopheles* mosquito. A great deal may be done towards this end by suppressing their breeding-places, which means the drying of the ground. It is a question for the engineer, and may require different methods in different circumstances. Put comprehensively, it involves the control of the subsoil and surface waters by drainage, the regulation of rivers and floods, suitable agriculture, the clearing of forests or jungles, which tend to increase the rainfall and keep the ground swampy.

The city of Rome is an example of what can be done by drainage; situated in the midst of malaria, it is itself quite healthy. Recent reports also show us how much may be done in infected districts. At Ismailia malaria was reduced from 1551 cases in 1902 to 37 cases in 1905. The cost of operations amounted to an initial expenditure of 6.25 francs, and an annual expenditure of about 2.3 francs per head of the population. "The results are due to mosquito reduction together with cinchonization." The following is a tabulated list of the cases. The population of Ismailia is about 6000.

Year	1900	1901	1902*	1903	1904	1905
Cases of Malaria	2250	1990	1548	214	90	372**

* Drainage works begun.

** Nearly all were relapses of previous infection.

Klang and Port Swettenham are contiguous towns in the Federated Malay States, having a population of 4000 and a rainfall of 100 in. a year. At Klang the expenditure has been £3100, with an annual expenditure of £270, devoted to clearing and draining 332 acres. At Port Swettenham £7000, with an annual upkeep of £240, has been devoted to treating 110 acres. In Hong-Kong similar measures were carried out, with the result that the hospital admissions for malaria diminished from 1294 in 1901, the year when operations were begun, to 419 in 1905.

Klang and Port Swettenham.

Year	1900	1901*	1902	1903	1904	1905
Cases of Malaria	510	610	199	69	32	23

* Drainage works begun.

A systematic campaign for the destruction of breeding-places has been inaugurated in the British West African colonies, with encouraging results. The planting of eucalyptus trees is out of favour at present, but it appears to have been successful in Portugal, not from any prophylactic virtues in the plant, but through the great absorption of moisture by its deep roots, which tends to dry the subsoil. Treating the breeding-ponds with petroleum or similar preparations seems to be hardly applicable on a large scale, and in any case can only be a temporary expedient. H. Ziemann advocates the destruction of mosquito larvae by the growing of such plants as the water-pest (*Anacharis alsinatrum*) which covers the surface of the water and suffocates larvae and nymphae. Short of suppressing mosquitoes, the parasitic cycle may theoretically be broken by preventing them from giving the infection to man or taking it from him. The means of accomplishing the former have been already pointed out, but they are obviously difficult to carry out on a large scale, particularly in native communities. It is one thing to protect individuals from mosquito bites, another to prevent the propagation of the parasite in a whole community. Perhaps the converse is more feasible in some circumstances—that is to say, preventing mosquitoes from having access to malarial persons, and so propagating the parasite in themselves. It could be carried out where the infected persons are few, by isolating and protecting them, but not where many are infected, as in native villages. Koch has suggested that the disinfection of malarial persons by quinine would have the desired effect, but other authorities of greater experience do not consider it practicable. In spite of the difficulties, however, there is no doubt that a great deal can be done to reduce, if not stamp out, malaria by the methods indicated, which should be applied

according to circumstances. An encouraging example is afforded by the remarkable fact that malaria, which was once rife in certain districts of England, has now died out, although the *Anopheles maculipennis* mosquito still exists there. The parasitic cycle has been broken, and the insect is no longer infected. The suggested causes are (1) reduction of insects by drainage, (2) reduced population, (3) the use of quinine. Sir Patrick Manson has suggested that the problem of stamping out malaria may be assisted by the discovery of some at present unknown factors. He has pointed out that certain areas and certain islands are entirely free from the disease, while neighbouring areas and islands are devastated. This immunity is apparently not due to the absence of favourable conditions, but rather to the presence of some inimical factor which prevents the development of the parasite. If this factor could be discovered it might be applied to the suppression of the disease in malarious localities.

A few other points may be noted. The pathological changes in malaria are due to the deposition of melanin and the detritus of red corpuscles and haemoglobin, and to the congregation of parasites in certain sites (Ross). In chronic cases the eventual effects are anaemia, melanosis, enlargement of the spleen and liver, and general cachexia. Apparently the parasites may remain quiescent in the blood for years and may cause relapses by fresh sporulation. Recent discoveries have done little or nothing for treatment. Quinine still remains the one specific. In serious cases it should not be given in solid form, but in solution by the stomach, rectum, or—better—hypodermically (Manson). According to Ross, it should be given promptly, in sufficient doses (up to 30 grains), and should be continued for months. Euquinine is by some preferred to quinine, but it is more expensive. Nucleogen and Aristochin have also been recommended instead of quinine. The nature of immunity is not known. Some persons are naturally absolutely immune (Celli), but this is rare; immunity is also sometimes acquired by infection, but as a rule persons once infected are more predisposed than others. Races inhabiting malarious districts acquire a certain degree of resistance, no doubt through natural selection. Children are much more susceptible than adults.

Malaria in the Lower Vertebrates.—Birds are subject to malaria, which is caused by blood parasites akin to those in man and having a similar life-history. Two species, affecting different kinds of birds, have been identified. Their alternate hosts are mosquitoes of the *Culex* genus. Oxen, sheep, dogs, monkeys, bats, and probably horses also suffer from similar parasitic diseases. In the case of oxen the alternate host of the parasite is a special tick (Smith and Kilborne). In the other animals several parasites have been described by different observers, but the alternate hosts are not known.

AUTHORITIES.—Celli, *Malaria*; Christy, *Mosquitoes and Malaria*; Manson, *Tropical Diseases*; Allbutt's *System of Medicine*; Ross, "Malaria," Quain's *Dictionary of Medicine*, 3rd ed.; *The Practitioner*, March, 1901 (Malaria Number); *Lancet* (Sept. 29, 1907); *British Medical Journal* (Oct. 19, 1907); *Indian Medical Gazette* (February 1908).

(A. SL.; H. L. H.)

MALATIA

(MALATIEH or ASPUZU) the chief town of a sanjak of the same name in the Mamuret el-Aziz vilayet of Asia Minor, and a military station on the Samsun-Sivas-Diarbekr road, altitude 2900 ft., situated about 10 m. S.W. of the junction of the Tokhma Su (med. Kubakīb) with the Euphrates, near the south end of a fertile plain, and at the northern foot of the Taurus. Pop. about 30,000, including, besides many Armenian Christians, bodies of Kurds and "Kizilbash." It is a wholly modern place, rebuilt since the earthquake of 1893, contains fine public buildings, and is noted for its fruit orchards. There are Protestant (American) and Roman Catholic missions, and an Armenian Catholic archbishop has his seat here. Eskishehr or Old Malatia (*Melitene*), 5 m. N.E. and 3 m. from the great medieval bridge (Kirkgeuz) over the Tokhma Su, is said to owe its present desolation largely to its occupation by Hafiz Pasha as his headquarters in 1838 before his advance to fight the disastrous battle of Nizib with the Egyptian, Ibrahim. But it has still many inhabitants and large gardens and many ruinous mosques, baths, &c., relics of Mansur's city. It was the residence of von Moltke for some months, while attached to Hafiz's army. The earliest site was possibly Arslan Tepe about 2 m. south of Eskishehr were two "Hittite" stelae, representing hunting scenes, now in the Constantinople and Paris museums, were found in 1894.

In the time of Strabo (xii. 537) there was no town in the district of Melitene, which was reckoned part of Cappadocia. Under Titus the place became the permanent station of the 12th ("Thundering") legion; Trajan raised it to a city. Lying in a very fertile country at the crossing point of important routes, including the Persian "Royal Road," and two imperial military highways from Caesarea and along the Euphrates bank, it grew in size and importance, and was the capital of Armenia Minor or Secunda. Justinian, who completed the walls commenced by Anastasius, made it the capital of Armenia Tertia; it was then a very great place (Procop., *De aed.*, iii. 4). The town was burnt by Chosroes on his retreat after his great defeat there in 577. Taken by the Saracens, retaken and destroyed by Constantine Copronymus, it was presently recovered to Islam, and rebuilt under Mansur (A.D. 756). It again changed hands more than once, being reckoned among the frontier towns of Syria (Istakhry, pp. 55, 62). At length the Greeks recovered it in 934, and Nicephorus II., finding the district much wasted, encouraged the Jacobites to settle in it, which they did in great numbers. A convent of the Virgin, and the great church which bears his name, were erected by the bishop Ignatius (Isaac the Runner). From this time Malatia continued to be a great seat of the Jacobites, and it was the birthplace of their famous maphrian Barhebraeus (or Abulfaragius). At the commencement of the 11th century the population was said to number 60,000 fighting men (Assem., *Bib. Or.*, ii. 149; cf. Barheb., *Chr. Eccl.*, i. 411, 423). At the time of the first crusade, the city, being hard pressed by the Turks under Ibn Danishmend, was relieved by Baldwin, after Bohemund had failed and lost his liberty in the attempt. But the Jacobites had no cause to love Byzantium, and the Greek governor Gabriel was so cruel and faithless that the townsmen were soon glad to open their gates to Ibn Danishmend (1102), and the city subsequently became part of the realm of Kilij Arslan, sultan of Iconium.

See H. C. B. v. Moltke, *Briefe über Zustände, &c. in der Türkei* (1835-1839).

(D. G. H.)

MALAYALAM, a language of the Dravidian family, spoken on the west coast of southern India. It is believed to have developed out of Tamil as recently as the 9th century. It possesses a large literature, in which words borrowed from Sanskrit are conspicuous. In 1901 the total number of speakers of Malayalam in all India was just about six millions.

MALAY ARCHIPELAGO[1] (variously called *Malaysia*, the *Indian Archipelago*, the *East Indies*, *Indonesia*, *Insulinde*), the largest group of islands in the world, lying south-east of Asia and north and north-west of Australia. It includes the Sunda Islands, the Moluccas, New Guinea, and the Philippine Islands, but excludes the Andaman-Nicobar group. The equator passes through the middle of the archipelago; it successively cuts Sumatra, Borneo, Celebes and Halmahera, four of the most important islands. A. R. Wallace (who includes the Solomon Islands as well as New Guinea in the group) points out that the archipelago "includes two islands larger than Great Britain; and in one of them, Borneo, the whole of the British Isles might be set down, and would be surrounded by a sea of forests. Sumatra is about equal in extent to Great Britain; Java, Luzon, and Celebes are each about the size of Ireland. Eighteen more islands are on the average as large as Jamaica; and more than a hundred are as large as the Isle of Wight."

	Area.	Estimated Population.
Sunda Islands	459,578	32,632,400
Moluccas, with Celebes	115,334	3,000,000
New Guinea	312,329	800,000
Philippine Islands	115,026	7,635,400

The islands of the archipelago nearly all present bold and picturesque profiles against the horizon, and at the same time the character of the scenery varies from island to island and even from district to district. The mountains are arranged for the most part in lines running either from north-west to south-east or from west to east. In Sumatra and in the islands between Sumatra and Borneo the former direction is distinctly marked, and the latter is equally noticeable in Java and the other southern islands. The mountains of Borneo, however, rise rather in short ridges and clusters. Nothing in the general physiognomy of the islands is more remarkable than the number and distribution of the volcanoes, active or extinct. Running south-east through Sumatra, east through Java and the southern islands to Timor, curving north through the Moluccas, and again north, from the end of Celebes through the whole line of the Philippines, they follow a line roughly resembling a horseshoe narrowed towards the point. The loftiest mountain in the archipelago would appear to be Kinabalu in Borneo (13,698 ft.). An important fact in the physical geography of the archipelago is that Java, Bali, Sumatra and Borneo, and the lesser islands between them and the Asiatic mainland, all rest on a great submerged bank, nowhere more than 100 fathoms below sea-level, which may be considered a continuation of the continent; while to the east the depth of the sea has been found at various places to be from 1000 to 2500 fathoms. As the value of this fact was particularly emphasized by Wallace, the limit of the shallow water, which is found in the narrow but deep channel between Bali and Lombok, and strikes north to the east of Borneo, has received the name of "Wallace's Line." The Philippines on the other hand, "are almost surrounded by deep sea, but are connected with Borneo by means of two narrow submarine banks" (A. R. Wallace, *Island Life*). The archipelago, in effect, is divided between two great regions, the Asiatic and the Australian, and the fact is evident in various branches of its geography—zoological, botanical, and even human. It is believed that there was a land-connexion between Asia and Australia in the later part of the Secondary epoch, and that the Australian continent, when separated, became divided into islands before the south-eastern part of the Asiatic did so.

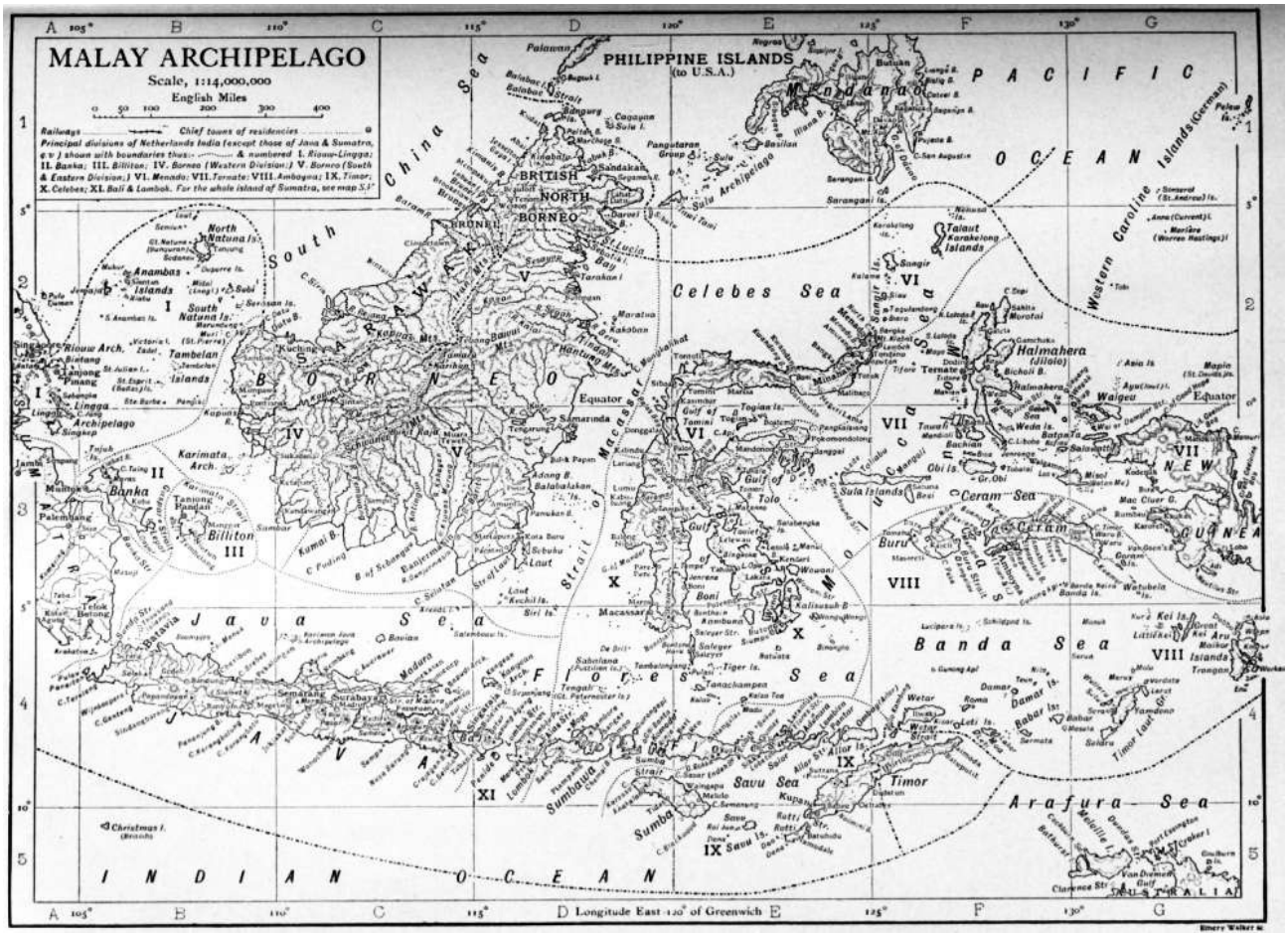
> The most notable fact in the geological history of the archipelago is the discovery in Java of the fossil remains of *Pithecanthropus erectus*, a form intermediate between the higher apes and man. In its structure and cranial capacity it is entitled to a higher place in the zoological scale than any anthropoid, for it almost certainly walked erect; and, on the other hand, in its intellectual powers it must have been much below the lowest of the human race at present known. The strata in which it was found belong to the Miocene or Upper Pliocene. Among the rocks of economic importance may be mentioned granite of numerous kinds, syenite, serpentine, porphyry, marble, sandstones and marls. Coal is worked in Sumatra, Borneo and Labuan. Diamonds are obtained in Borneo, garnets in Sumatra, Bachian and Timor, and topazes in Bachian, antimony in Borneo and the Philippines; lead in Sumatra, Borneo and the Philippines; copper and malachite in the Philippines, Timor, Borneo and Sumatra; and, most important of all, tin in Banka, Billiton and Singkep. Iron is pretty frequent in various forms. Gold is not uncommon in the older ranges of Sumatra, Banka, Celebes, Bachian, Timor and Borneo. Manganese could be readily worked in Timor, where it lies in the Carboniferous Limestone. Platinum is found in Landak and other parts of Borneo. Petroleum is a valuable product of Sumatra and Java, and is also found in Borneo.

Climate, *Flora*, *Fauna*.—The most striking general fact as regards climate in the archipelago is that wherever that part of the south-east monsoon which has passed over Australia strikes, the climate is comparatively dry, and the vegetation is less luxuriant. The east end of Java, *e.g.* has a less rainfall than the

west; the distribution of the rain on the north coast is quite different from that on the south, and a similar difference is observed between the east and the west of Celebes. The north-west monsoon, beginning in October and lasting till March, brings the principal rainy season in the archipelago.

Most of the islands of the archipelago belong to the great equatorial forest-belt. In its economical aspect the vegetation, whether natural or cultivated, is of prime interest. The list of fruits is very extensive, though few of them are widely known. These, however, include the orange, mango, mangosteen, shaddock, guava and the durian. The variety of food-plants is equally notable. Not only are rice and maize, sugar and coffee, among the widely cultivated crops, but the coco-nut, the bread-fruit, the banana and plantain, the sugar-palm, the tea-plant, the sago-palm, the coco-tree, the ground-nut, the yam, the cassava, and others besides, are of practical importance. The cultivation of sugar and coffee owes its development mainly to the Dutch; and to them also is due the introduction of tea. They have greatly encouraged the cultivation of the coco-nut among the natives, and it flourishes, especially in the coast districts, in almost every island in their territory. The oil is largely employed in native cookery. Pepper, nutmegs and cloves were long the objects of the most important branch of Dutch commerce; and gutta-percha, camphor, dammar, benzoin and other forest products have a place among the exports.

To the naturalist the Malay Archipelago is a region of the highest interest; and from an early period it has attracted the attention of explorers of the first rank. The physical division between the Asiatic and Australian regions is clearly reflected in the botany and zoology. The flora of the Asiatic islands (thus distinguished) "is a special development of that prevailing from the Himalayas to the Malay Peninsula and south China. Farther east this flora intermingles with that of Australia" (F. H. H. Guillemard, *Australasia*). Similarly, in the Asiatic islands are found the great mammals of the continent—the elephant, tiger, rhinoceros, anthropoid ape, &c., which are wanting in the Australian region, with which the eastern part of the archipelago is associated. (For details concerning flora and fauna, see separate articles, especially Java.)



(Click to enlarge.)

Inhabitants.—The majority of the native inhabitants of the Malay Archipelago belong to two races, the Malays and the Melanesians (Papuans). As regards the present racial distribution, the view accepted by many anthropologists, following A. H. Keane, is that the Negritos, still found in the Philippines, are the true aborigines of Indo-China and western Malaysia, while the Melanesians, probably their kinsmen, were the earliest occupants of eastern Malaysia and western Polynesia. At some date long anterior to history it is supposed that Indo-China was occupied first by a fair Caucasian people and later by a yellow Mongolian race. From these two have come all the peoples—other than Negrito or Papuan—found to-day from the Malay Peninsula to the farthest islands of Polynesia. The Malay Archipelago was thus first invaded by the Caucasians, who eventually passed eastward and are to-day represented in the Malay Archipelago only by the Mentawi islanders. They were followed by an immigration of Mongol-Caucasic peoples with a preponderance of Caucasic blood—the Indonesians of some, the pre-Malays of other writers—who are to-day represented in the archipelago by such peoples as the Dyaks of Borneo and the Battas of Sumatra. At a far later date, probably almost within historic times, the true Malay race, a combination of Mongol and Caucasic elements, came into existence and overran the archipelago, in time becoming the dominant race. A Hindu strain is evident in Java and others of the western islands; Moors and Arabs (that is, as the names are used in the archipelago, Mahommedans from various countries between Arabia and India) are found more or less

amalgamated with many of the Malay peoples; and the Chinese form, from an economical point of view, one of the most important sections of the community in many of the more civilized districts. Chinese have been established in the archipelago from a very early date: the first Dutch invaders found them settled at Jacatra; and many of them, as, for instance, the colony of Ternate, have taken so kindly to their new home that they have acquired Malay to the disuse of their native tongue. Chinese tombs are among the objects that strike the traveller's attention at Amboyna and other ancient settlements.

There is a vast field for philological explorations in the archipelago. Of the great number of distinct languages known to exist, few have been studied scientifically. The most widely distributed is the Malay, which has not only been diffused by the Malays themselves throughout the coast regions of the various islands, but, owing partly to the readiness with which it can be learned, has become the common medium between the Europeans and the natives. The most cultivated of the native tongues is the Javanese, and it is spoken by a greater number of people than any of the others. To it Sundanese stands in the relation that Low German holds to High German, and the Madurese in the relation of a strongly individualized dialect. Among the other languages which have been reduced to writing and grammatically analysed are the Balinese, closely connected with the Javanese, the Batta (with its dialect the Toba), the Dyak and the Macassarese. Alfurese, a vague term meaning in the mouths of the natives little else than non-Mahommedan, has been more particularly applied by Dutch philologists to the native speech of certain tribes in Celebes. The commercial activity of the Buginese causes their language to be fairly widely spoken—little, however, by Europeans.

Political Division.—Politically the whole of the archipelago, except British North Borneo, &c. (see BORNEO), part of Timor (Portuguese), New Guinea east of the 141st meridian (British and German), and the Philippine Islands, belongs to the Netherlands. The Philippine Islands which had been for several centuries a Spanish possession, passed in 1898 by conquest to the United States of America. For these several political units see the separate articles; a general view, however, is here given of the government, economic conditions, &c., of the Dutch possessions, which the Dutch call *Nederlandsch-Indië*.

NETHERLANDS INDIA

Administration.—The Dutch possessions in Asia lie between 6° N. and 11° S. and 95° E. and 141° E. Politically they are divided into lands under the direct government of the Netherlands vassal lands and confederated lands. Administratively they are further divided into residencies, divisions, regencies, districts, and *dessas* or villages. In the principal towns and villages there are parish councils, and in some provinces county councils have been established. Natives, Chinese and Arabs, are given seats, and in certain instances some of the members are elected, but more generally they are appointed by government. The islands are often described as of two groups, Java and Madura forming one, and the other consisting of Sumatra, Borneo, Riouw-Lingga Archipelago, Banka, Billiton, Celebes, Molucca Archipelago, the small Sunda Islands, and a part of New Guinea—the Outposts as they are collectively named. The Outposts are divided into 20 provinces. A governor-general holds the superior administrative and executive authority, and is assisted by a council of five members, partly of a legislative and partly of an advisory character, but with no share in the executive work of the government. In 1907 a Bill was introduced to add four extraordinary members to the council, but no immediate action was taken. The governor-general not only has supreme executive authority, but can of his own accord pass laws and regulations, except in so far as these, from their nature, belong of right to the home government, and as he is bound by the constitutional principles on which, according to the *Regulations for the Government of Netherlands India*, passed by the king and States-General in 1854, the Dutch East Indies must be governed. There are nine departments, each under a director: namely, justice; interior; instruction, public worship and industry; agriculture (created in 1905); civil public works; government works (created in 1908); finance; war; marine. The administration of the larger territorial divisions (*gouvernement*, *residentie*) is in the hands of Dutch governors, residents, assistant residents and *contrôleurs*. In local government a wide use is made of natives, in the appointment of whom a primary consideration is that if possible the people should be under their own chieftains. In Surakarta and Jokjakarta in Java, and in many parts of the Outposts, native princes preserve their positions as vassals; they have limited power, and act generally under the supervision of a Dutch official. In concluding treaties with the vassal princes since 1905, the Dutch have kept in view the necessity of compelling them properly to administer the revenues of their states, which some of them formerly squandered in their personal uses. Provincial banks have been established which defray the cost of public works.

Population.—The following table gives the area and population of Java (including Madura) and of the Outposts:—

		Area: English sq. m.	Pop.	
			1900.	1905.
Java and Madura		50,970	28,746,688	30,098,008
Sumatra	Sumatra, West Coast	31,649	1,527,297	4,029,505
	Sumatra, East Coast	35,312	421,090	
	Benkulen	9,399	162,396	
	Lampong Districts	11,284	142,426	
	Palembang	53,497	804,299	
	Achin	20,471	110,804	
Riouw-Lingga Archipelago		16,301	86,186	112,216
Banka		4,446	106,305	115,189
Billiton		1,863	43,386	36,858
Borneo, West Coast		55,825	413,067	1,233,655
Borneo, South and East Districts		156,912	716,822	
Celebes	Celebes	49,390	454,368	415,499
	Menado	22,080	429,773	436,406
Molucca Islands		43,864	410,190	407,419
Timor Archipelago		17,698	119,239	308,600
Bali and Lombok		4,065	1,041,696	523,535
New Guinea to 141° E.		151,789	200,000	....

Total	736,815	36,000,000	37,717,377*

* Including 487 in Merauke, the capital of Dutch New Guinea.

In no case are the above figures for population more than fairly accurate, and in some instances they are purely conjectural. The population is legally divided into Europeans and persons assimilated to them, and natives and persons assimilated to them. The first class includes half-castes (who are numerous, for the Dutch are in closer relationship with the natives than is the case with most colonizing peoples), and also Armenians, Japanese, &c. The total number of this class in 1900 was 75,833; 72,019 of these were called Dutch, but 61,022 of them were born in Netherlands India; there were also 1382 Germans, 441 British and 350 Belgians. Among the natives and persons assimilated to them were about 537,000 Chinese and 27,000 Arabs. In the decade 1890-1900 the increase of the European population was 30.9%, of the Arabs 26.6%, and of the Chinese 16.5%. A large proportion of the Europeans are government officials, or retired officials, for many of the Dutch, once established in the colonies, settle there for life. The remaining Europeans are mostly planters and heads of industrial establishments; the Arabs are nearly all traders, as are some of the Chinese, but a large number of the latter are labourers in the Sumatra tobacco plantations and the tin mines of Banka, Billiton, &c. The bulk of the natives are agriculturists. 468

Religion and Instruction.—Entire liberty is granted to the members of all religious confessions. The Reformed Church has about 40 ministers and 30 assistants, the Roman Catholic 35 curates and 20 priests, not salaried out of the public funds. There are about 170 Christian missionaries, and the progress of their work may be illustrated by showing that the number of Christians among the natives and foreign Orientals was:—

	In 1873.	In 1896.	In 1903.
In Java and Madura	5,673	19,193	About 34,000
In the Outposts	148,672	290,065	About 390,000

About 10,000 natives go annually to Mecca on pilgrimage.

Both the government and private enterprise maintain vernacular schools. Large sums have been voted in Holland for the establishment of primary and secondary schools, and the government has undertaken to assist in the establishment of parochial schools, the object being that every village, at least in Java, should possess one. There are schools for higher education at Batavia, Surabaya and Semarang; at the first two of these towns are government schools for mechanical engineering, and at Batavia a crafts school and a medical school for natives. There are five colleges for native schoolmasters and four for sons of native officials. Government schools for the European education of Chinese children are established in the principal towns. Private mechanical and crafts schools are established at Jokjakarta, Surabaya and Semarang, and there is an agricultural school at Buitenzorg.

Justice.—As regards the administration of justice, the distinction is maintained between (1) Europeans and persons assimilated with them (who include Christians and Japanese), and (2) natives, together with Chinese, Arabs, &c. The former are subject to laws closely resembling those of the mother country, while the customs and institutions of natives are respected in connexion with the administration of justice to the latter. In 1906 a bill was passed somewhat modifying the existing status of the classes above mentioned, and especially directing new ordinances with regard to the judicial treatment of Christian natives. A general judicial revision being also in contemplation, this bill did not immediately come into force. Justice for Europeans is administered by European judges, but, as with administration at large so in judicial matters, native chiefs have extensive powers in native affairs. For European justice the High Court of Justice is established at Batavia; there are councils of justice at Batavia, Semarang and Surabaya, with authority not only over Java but over parts of the Outposts; there is a resident court of justice in each residency. For native justice there are courts in the districts and regencies; residents act as police judges; provincial councils have judicial powers, and there are councils of priests with powers in matrimonial disputes, questions of succession, &c.

As regards pauperism, the government subsidizes Protestant and Catholic orphan houses.

Finance.—The revenue of Netherlands India has been derived mainly from customs, excise, ground-tax, licences, poll-tax, &c., from monopolies—opium, salt and pawn-shops (the management of which began to be taken over by the government in 1903, in place of the previous system of farming-out), coffee, &c., railways, tin mines and forests, and from agricultural and other concessions. But attempts have been made, and have been largely successful, to make the revenue dependent to a less extent on monopolies and the products (especially agricultural) of the land; and to abolish licences and substitute direct taxes. There is a progressive income-tax for Europeans, and the system has also been applied in the case of natives.

The following table affords comparisons in the revenue and expenditure:—

Year.	Revenue.	Expenditure.
1880	£12,236,500	£12,244,666
1890	11,482,457	10,644,728
1900	11,832,417	12,313,854
1905	12,951,497	13,844,173

The monetary system is similar to that of Holland (the unit being the *guilder*), but there are also certain silver and copper coins of small value bearing Malay or Javanese inscriptions. The Java Bank, established in 1828, with headquarters at Batavia, is the only bank issuing notes, two-fifths of the amount of which must be covered by specie or bullion. The government has a control over the administration of this bank.

Defence.—The army is purely colonial, *i.e.* distinct from that of the Netherlands. Its strength is a little under 40,000, about one-third being Europeans of various nationalities and two-thirds natives of various races. No portion of the regular army of the Netherlands is allowed to be sent on colonial service, but individual soldiers are at liberty to enlist, by permission of their commanding officers, in the army of Netherlands India, and they form its nucleus. Native and European soldiers are generally mixed together in the same battalions, though in separate companies. The officers were all Dutch till 1908, when a trial was made of native officers from noble

Javanese families. The artillery is composed of European gunners, with native riders, while the cavalry are Europeans and natives. A military academy is established at Meester Cornelis, near Batavia. Schools for soldiers are attached to every battalion. There are certain local forces outside the regular army—militia in some of the large towns, native infantry in Madura, and guards of some of the vassal princes. Unlike the army, which is purely colonial, the navy in Netherlands India is partly colonial, partly belonging to the royal navy of the Netherlands, and its expenses are therefore borne partly by the mother country and partly by the colony. About six ironclads and twenty smaller vessels of the royal navy are stationed in colonial waters; the vessels of the colonial marine number about twenty-four, and undertake police supervision, prevention of slave trading, &c.

Trade and Industries.—The principal articles of export are sugar, tobacco, copra, forest products (various gums, &c.), coffee, petroleum, tea, cinchona, tin, rice, pepper, spices and gambier. The average annual value of exports during 1900-1905 was £22,496,468, and of imports £17,050,338. A great proportion of the exports goes to the mother country, though a considerable quantity of rice is exported to China. An indication of the mineral products has already been given; as regards the export trade, tin is the most important of these, but the Ombilin coalfields of Sumatra, connected by a railway with the coast, call for mention here also. Agricultural labour is very carefully regulated by law, in the enforcement of which the residents and lower officials have wide powers. One day's gratuitous labour out of seven or more can be demanded of labourers either on private or on government estates; but in 1882 this form of labour was for the most part abolished as far as government estates were concerned, each labourer so exempted paying one guilder per year. The principal private agricultural estates are in the west of Java, in which island the greater part of the soil is government property. Such estates have increased greatly in number and extent, not only in Java but elsewhere, since the agrarian law of 1870, under which it became possible for settlers to obtain waste lands on hereditary lease for 75 years. In 1899 the total acreage of land ceded was 1,002,766 acres; in 1903 it was 1,077,295. The government ceased to cultivate sugar in 1891, but coffee, and to some extent cinchona, are cultivated on government plantations, though not in equal quantity to that grown on land held on emphyteusis. The average annual yield of sugar in 1900-1905 was 852,400 tons, but it increased steadily during that period. The average annual yield of coffee during the same period was 101,971,132 lb; it fluctuates greatly. The average annual production of tobacco is about fifty million pounds from each of the islands of Java and Sumatra. The total annual yield of the tin mines is about 15,000 tons, and of the coal mines 240,000 tons. The average output of petroleum annually in 1900-1905 was 120,000,000 gallons; this, again, has fluctuated greatly. There are upwards of 3000 miles of railways and steam tramways in Netherlands India, but these are almost entirely in Java; elsewhere only Sumatra has a few short lines. The principal steamship company in the archipelago is the Royal Packet (*Koninklyke Paketvaart*) Company.

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History

Portuguese and Spanish Ascendancy, 1511-1595.—Ptolemy and other ancient geographers describe the Malay Archipelago, or part of it, in vague and inaccurate terms, and the traditions they preserved were supplemented in the middle ages by the narratives of a few famous travellers, such as Ibn Batuta, Marco Polo, Odoric of Pordenone and Niccolò Conti. Malay and Chinese records also furnish material for the early history of individual islands, but the known history of the archipelago as a whole begins in the 16th century. At this period a civilization, largely of Hindu origin, had flourished and decayed in Java, where, as in all the more important islands, Mahommedanism had afterwards become the dominant creed. But the smaller islands and the remoter districts, even of Java and Sumatra, remained in a condition of complete savagery.

The Portuguese were the first Europeans to colonize any part of the archipelago. A Portuguese squadron under Diogo Lopes de Sequeira arrived off Sumatra in 1509, explored the north coast for some distance, and noted that the inhabitants of the interior were cannibals, while those of the littoral were civilized and possessed a gold coinage. The main object of the Portuguese was to obtain a share in the lucrative spice trade carried on by the Malays, Chinese and Japanese; the trade-routes of the archipelago converged upon Malacca, which was the point of departure for spice merchants trading with every country on the shores of the Indian Ocean and Arabian Sea. In 1511 the Portuguese under Alphonso d'Albuquerque occupied Malacca, and in November of that year an expedition under Antonio de Abreu was despatched to find a route to the Moluccas and Banda Islands, then famous for their cloves and nutmegs. The explorers reached Amboyna and Ternate, after gaining some knowledge of Java, Madura, Sumbawa and other islands, possibly including New Guinea. During the return voyage the second-in-command, Francisco Serrão, was shipwrecked, but succeeded in making his way in a native boat to Mindanao. Thus the Philippines were discovered: In 1514 a second Portuguese fleet arrived at Ternate, which during the next five years became the centre of Portuguese enterprise in the archipelago; regular traffic with Malacca and Cochin was established, and the native raja

became a vassal of Portugal.

Meanwhile the Spanish government was considering whether the Moluccas did not fall within the Spanish sphere of influence as defined by the Treaty of Tordesillas in 1494; and in August 1519 an expedition commanded by Ferdinand Magellan (*q.v.*) sailed from Seville to seek a westward passage to the archipelago. After losing the commander in the Philippines and discovering Borneo, the two surviving ships reached the Moluccas late in 1520. One vessel returned to Seville by the Cape route, thus completing the first voyage round the world; the other attempted to return by the Pacific, but was driven back to Tidore and there welcomed by the natives as a useful ally against the Portuguese. Reinforcements from Spain arrived in 1525 and 1528; but in 1529 a treaty was concluded between the emperor Charles V. and John III. of Portugal, by which, in return for 350,000 gold ducats, the Spanish claim to the Moluccas was withdrawn. The boundary between the Spanish and Portuguese spheres was fixed at 17° E. of the Moluccas, but by a geographical fiction the Philippines were included within the Spanish sphere. Further disputes occurred from time to time, and in 1542 a Spanish fleet came into conflict with the Portuguese off Amboyna; but after 1529 the supremacy of each power in its own sphere was never seriously endangered.

Though the Portuguese traders frequented the coast of Java, they annexed no territory either there or in Sumatra; but farther east they founded numerous forts and factories, notably in Amboyna, the Banda Island, Celebes and Halmahera. Ternate remained the seat of the governor of the Moluccas, who was the highest official in the archipelago, though subordinate to the viceroy or governor of Portuguese India. The first attempt to enter into relations with the states of Borneo was made by D. Jorge de Menezes, who visited Brunci in 1526, and in 1528 sent an envoy to its raja. The embassy failed in a curious manner. Among the gifts sent by Menezes was a piece of tapestry representing the marriage of Catherine of Aragon to Arthur, prince of Wales. The raja was persuaded that these mysterious figures were demons under a spell, which might come to life and kill him as he slept. The envoy was therefore dismissed.

In 1536, after a period of war and anarchy caused by the tyrannical rule of Menezes, Antonio Galvão, the historian, was appointed governor of the Moluccas. He crushed the rebellion and won the affection of the natives by his just and enlightened administration, which had no parallel in the annals of Portuguese rule in the archipelago. He returned to Europe in 1540 (see PORTUGAL: *Literature*), after inaugurating an active missionary movement, which was revived in 1546-1547 by Francis Xavier (*q.v.*). At this period the Portuguese power in the East was already beginning to wane; in the archipelago it was weakened by administrative corruption and by incessant war with native states, notably Bintang and Achin; bitter hostility was aroused by the attempts which the Portuguese made to establish a commercial monopoly and to force Christianity upon their native subjects and allies (see PORTUGAL: *History*). From 1580 to 1640 Portugal was itself united to Spain —a union which differed from annexation in little but name.

The English and Dutch, 1595-1674.—Pirates from Dieppe visited the archipelago between 1527 and 1539. It is possible that they reached Australia[2]—more than sixty years before the first voyage thither of which there is any clear record; but their cruise had no political significance, and the Spaniards and Portuguese remained without European competitors until the appearance of Sir Francis Drake in 1579. An English squadron under Sir James Lancaster came into conflict with the Portuguese in 1591, and an expedition under Sir Henry Middleton traded in the archipelago in 1604. But the English were simple traders or explorers; far more formidable were the Dutch, who came to the East partly to avenge the injuries inflicted on their country by the Spaniards, partly to break the commercial monopoly of the peninsular states. As middlemen they already possessed a large interest in the spice trade, for the Portuguese, having no direct access to the principal European markets, had made a practice of sending cargo to the Netherlands for distribution by way of the Scheldt and Rhine. The Dutch now sought to monopolize not only the distribution but the production of spices —an enterprise facilitated by the co-operation of many exiled Portuguese Jews who had settled in Holland.

The first Dutch fleet sailed from Texel, under the command of Cornelis Houtman, on the 2nd of April 1595 and reached Sumatra on the 1st of January 1596. It visited Madura, and came into conflict with the Portuguese at Bantam in Java, returning to Holland in 1597. Though not a commercial success, the expedition had demonstrated the weakness of the Portuguese. In 1602 the Dutch East India Company (*q.v.*) was incorporated, and for nearly two centuries this organization played the chief part in the history of the archipelago. By 1604 the Dutch could already claim to be the stronger power at sea. They had attacked the Portuguese in Ceylon (1601), established friendly relations with Achin (1602), and defeated a powerful fleet off Banda (1602). In 1606 they concluded a treaty of alliance with the sultan of Johor, and in 1608 they forced the Portuguese to assent to an armistice for twelve years. On the 29th of November 1609 Pieter Both was chosen by the states-general, on the nomination of the Dutch East India Company, as first governor-general of Netherlands India. In 1611 the headquarters of the Dutch was changed from Bantam to Jakarta, which in 1619 was renamed Batavia, and was thenceforward the Dutch capital. Meanwhile the English East India Company, chartered in 1600, had also extended its operations to the archipelago. After 1611 the commercial rivalry between the Dutch and British became acute, and in 1613, 1615 and 1618 commissioners met in London to discuss the matters in dispute. The result of their deliberations was the Treaty of Defence, signed on the 2nd of June 1619 and modified on the 24th of January 1620, which arranged for co-operation between the Dutch and British companies, and especially for the maintenance of a joint fleet. But neither company could restrain its agents in the East from aggressive action, and many fresh causes of dispute arose, the chief being the failure of the British to provide the naval forces required for service against the Portuguese, and the so-called "massacre of Amboyna" (*q.v.*) in 1623. The Treaty of Defence lapsed in 1637, but as early as 1634 the British made peace with Portugal. Even without allies, however, the Dutch continued to extend their trade and to annex fresh territory, for the British were weakened by civil war at home, while, after 1640, the Portuguese were struggling to maintain their independence against Spain. The Dutch company opened up a profitable trade with Japan and China, and prosecuted the war against Portugal with great vigour, invading Portuguese India and capturing Point de Galle in 1640, Malacca in 1641, Cochin and Cannanore in 1663. The war with England in 1652-54 and the renewal of the Anglo-Portuguese alliance by the marriage of Charles II. to Catherine of Braganza in 1661 were unable to check the growth of Dutch power; more serious was the resistance offered by some of the native states. Rebellions in Java (1629) and the Moluccas (1650) were suppressed with great severity, but in 1662 the company suffered a heavy reverse in Formosa, all its colonists

being expelled from the island. A new war between Great Britain and Holland broke out in 1672 and was terminated by the Treaty of Westminster (February 17, 1674), by which the points at issue between the two companies were referred first to commissioners and finally to an arbitrator. The full details of the settlement are unknown, but thenceforward the British company devoted its energies chiefly to the development of its Indian possessions, while the Dutch were left supreme in the archipelago. In 1684 the British even evacuated Bantam, their chief settlement, and retired to Benkulen in Sumatra, which remained for more than a century their sole territorial possession in the archipelago.

Dutch Ascendancy, 1674-1749.—The weakness of Spain and Portugal and the withdrawal of the British left the Dutch company free to develop its vast colonial and commercial interests. In 1627 the so-called Dutch "colonial system" had been inaugurated by the fourth governor-general, Jan Pieterszoon Coen (*q.v.*). Under this system, which was intended to provide Netherlands India with a fixed population of European descent, Dutch girls were sent to the archipelago to be married to white settlers, and subsequently marriages between Dutchmen and captive native women were encouraged. As early as 1624 vast fortunes had been acquired by trade: two members of the company who died in that year were stated to possess seven and eight tons of gold respectively, an amount approximately equivalent, in the aggregate, to £2,000,000. The use of slave labour, and the application of the *corvée* system to natives who were nominally free, enabled the company to lower the cost of production, while the absence of competition enabled it to raise prices. The hardship inflicted on the native races provoked an insurrection throughout Java, in which the Chinese settlers participated; but the Dutch maintained naval and military forces strong enough to crush all resistance, and a treaty between the company and the Susuhunan in November 1749 made them practically supreme throughout the island.

Decline of Dutch Power, 1749-1811.—In the second half of the 17th century the monopoly system and the employment of slaves and forced labour gave rise to many abuses, and there was a rapid decline in the revenue from sugar, coffee and opium, while the competition of the British East India Company, which now exported spices, indigo, &c. from India to Europe, was severely felt. The administration was corrupt, largely because of the vast powers given to officials, who were invariably underpaid; and the financial methods of the company precipitated its ruin, large dividends being paid out of borrowed money. The burden of defence could no longer be sustained; piracy and smuggling became so common that the company was compelled to appeal to the states-general for aid. In 1798 it was abolished and its authority vested in a "Council of the Asiatic Possessions." In 1803 a commission met to consider the state of the Dutch colonies, and advocated drastic administrative and commercial reforms, notably freedom of trade in all commodities except firearms, opium, rice and wood—with coffee, pepper and spices, which were state monopolies. Some of these reforms were carried out by H. W. Daendels (1808-1811), who was sent out as governor-general by Louis Bonaparte, after the French conquest of Holland. Daendels, however, maintained the existing restrictions upon trade and even made rice a state monopoly. His harsh rule aroused great antagonism; in 1811 he was recalled and J. W. Janssens became governor-general.

British Occupation, 1811-1816.—Netherlands India was at this time regarded as a part of the Napoleonic Empire, with which Great Britain was at war. A British naval squadron arrived in the Moluccas in February 1810 and captured Amboyna, Banda, Ternate and other islands. In 1811 a strong fleet was equipped by Lord Minto, then governor-general of India, for the conquest of Java; a British force was landed on the 4th of August; Batavia was captured on the 26th, and on the 18th of September Janssens and the remnant of his army surrendered. Lord Minto had issued a proclamation establishing British rule on the 11th of September, and Thomas (afterwards Sir Thomas) Stamford Raffles was appointed lieutenant-governor. Raffles (*q.v.*) held office until March 1816, and introduced many important changes in the departments of revenue, commerce and judicature. He was succeeded by John Fendall, who in 1816 carried out the retrocession of Netherlands India to the Dutch, in accordance with the Treaty of Vienna (1814).

Restoration and Reform of Dutch Power, 1816-1910.—Various disputes between Great Britain and the Netherlands, arising chiefly out of the transfer of power in Java and the British occupation of Singapore (1819), were settled by treaty between the two powers in 1824. By this treaty the Dutch were given almost entire freedom of action in Sumatra, while the Malay Peninsula was recognized as within the British sphere of influence. In 1825-30 a serious rebellion in Java involved the despatch of a large military force from the Netherlands, and was with difficulty suppressed. An outbreak of Mahommedan fanaticism in Sumatra also gave much trouble.

The reform movement inaugurated by the commission of 1803 was resumed in 1830, when Governor-General Johannes van den Bosch endeavoured to improve the conditions of land-tenure and agriculture by introducing the so-called "culture system." The native cultivators were to be exempted from the ground-tax, but were to cultivate one-fifth of their land as the government might direct, the government taking the produce. This culture-system worked fairly during Van den Bosch's tenure of office, but gave rise to many abuses between 1833 and 1844, involving, as it did, a combination of the *métayer* and *corvée* systems.

In 1848 the *Grondwet*, or fundamental law of the Netherlands, recognized for the first time the responsibility of the Dutch nation for its colonial dependencies. The *Grondwet* involved certain important changes, which were embodied in an act passed in 1854 and commonly known as the *Regulations for the Government of Netherlands India*. The *Regulations* substituted statute law for administrative and military despotism, and made the governor-general in council responsible to the minister of the colonies at the Hague. They reformed the judicature, introduced elementary education for the natives, and abolished slavery in Java as from the 1st of January 1860. They also prepared the way for further legislation tending towards the gradual emancipation of the natives from the culture system, and from semi-feudal servitude to their native rulers. That servitude existed in many forms all over the archipelago, but among the most curious must be reckoned the *pandelingschap* or "pledgedom," which originated in Borneo, and according to which a man had the power to make his debtors his serfs until their debts were paid.

The reform movement was aided by the publication in 1860 of *Max Havelaar*, a romance by E. Douwes Dekker (*q.v.*), which contained a scathing indictment of the colonial system. Many important financial and agrarian measures were carried between 1860 and 1890. In 1863 Fransen van de Putte, minister for the colonies, introduced the first of the annual colonial budgets for which the *Regulations* had provided, thus

enabling the states-general to control the revenue and expenditure of Netherlands India; in 1865 he reduced and in 1872 abolished the differentiation of customs dues in favour of goods imported from Holland, substituting a uniform import duty of 6% and establishing a number of free ports throughout the archipelago. The import duty was considered so moderate that an increase required for revenue purposes was readily conceded in 1886. In 1876 the practice of paying a yearly surplus (*batig slot*) from the revenues of Netherlands India to the treasury at the Hague was discontinued. The chief reforms in the land system were those introduced by De Waal, then minister for the colonies, in 1870. The cultivation of pepper, cochineal, cinnamon and indigo for the government had already ceased; De Waal restricted the area of the sugar plantations (carried on by forced native labour) as from 1878, and provided for their abolition after 1890. He also enabled natives to secure proprietary rights over the land they cultivated, and legalized the leasing of Crown forest-lands to Europeans.

The extension of Dutch political power—notably in Java, Sumatra, Celebes, the Moluccas, Borneo, the Sunda Islands and New Guinea—proceeded simultaneously with the reform movement, and from time to time involved war with various native states. A large expedition was sent to Lombok in 1894, and almost the whole of that island was incorporated in the Dutch dominions. The long and costly war with Achin (*q.v.*) began in 1873 and reached its climax in the military occupation of the country after 1905, when the native sultan surrendered and was deported. A guerrilla war was still carried on by his subjects, but their principal leader, the chief Panglima Polim, was captured in 1907; in 1908-1910 the condition of Achin under the military rule of General Swart was one of almost unbroken peace, and taxes were regularly paid.

While the Dutch were thus consolidating their authority, other countries were acquiring new commercial or colonial interests in the archipelago. Immigration from China and Japan steadily increased, especially towards the end of the period 1816-1910. The enterprise of Sir James Brooke (*q.v.*) led, after 1838, to the establishment of British sovereignty in North Borneo; in 1895 New Guinea was divided between Great Britain, Germany and the Netherlands; and the Spanish-American War of 1898 resulted in the cession of the Philippines, Sulu Island and the largest of the Mariana Islands to the United States, and the sale of the Caroline group to Germany. Australian and Japanese trade in the archipelago was stimulated by the establishment of the Australian Commonwealth (1901) and the Russo-Japanese War (1904-5). In 1910 the nations most directly interested in the future of the archipelago were the Netherlands, Great Britain, the United States, Germany, Japan, China and Portugal.

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(K. G. J.)

1 For more detailed information respecting the several islands and groups of the archipelago, see the separate articles BORNEO; JAVA; PHILIPPINE ISLANDS; SUMATRA, &c.

2 See *The Geographical Journal*, ix. 80 seq. (London, 1897).

MALĀIR,

a small province of Persia, situated between Hamadan and Burujird. It has a population of about 70,000, and, together with the district Tusirkhan, pays a yearly revenue of about £13,000. It produces much corn and fruit; a great quantity of the latter, dried, is exported. Its capital and seat of government is Doletabad (Dowletabad), a thriving little city, with a population of about 5000, situated at an elevation of 5680 ft., 38 m. from Hamadan and 32 m. from Burujird. It has post and telegraph offices.

MALAY PENINSULA

(called by the Malays *Tanah Malayu*, *i.e.* the Malay Land), a lozenge-shaped strip of land projecting into the China Sea, and forming the most southerly portion of the continent of Asia. Geographically, the peninsula begins at the isthmus of Kra, 10° N., at which point it is only between 60 and 70 m. in width, and the distance from sea to sea is further diminished by a large irregular salt-water inlet. Politically and anthropologically, however, this upper portion must be regarded as a continuation of the kingdom of Siam rather than as a section of Malaya. From the isthmus of Kra the peninsula extends south with a general inclination towards the east, the most southerly point being Tanjong Bulus in 1° 16½′ N. A line drawn diagonally down the centre from the isthmus of Kra to Cape Romania (Ramunya) gives the extreme length at about 750 miles. The breadth at the widest point, from Tanjong Pen-unjut in Trengganu to Tanjong Hantu in the Dindings territory, is about 200 m. The area is estimated at about 70,000 sq. m. The peninsula is bounded on the N. by Siam, on the S. by the island and strait of Singapore, on the E. by the China Sea, and on the W. by the Strait of Malacca.

Physical Characteristics.—A range of granite mountains forms a backbone which divides the peninsula into two unequal portions, the larger of which lies to the east and the smaller to the west of the chain. Smaller ranges run parallel to the main mountain chain in many places, and there are numerous isolated spurs which have no connexion with either. The country is covered with limestone in many parts, and large isolated bluffs of this formation stand up in the plains both on the eastern and the western slopes. The descent from the summits of the range into the plain is somewhat less abrupt on the western than it is on the eastern side, and between the foot of the mountains and the Strait of Malacca the largest known alluvial deposits of tin are situated. On the eastern side of the range, after a steep descent, the granite formation speedily gives place to slates of vast depth, intersected here and thereby fissures of quartz containing gold, and in many places covered by limestone which has been superimposed upon the slates. The highest known peak in the main range is that of Gunong Korbu, 7217 ft. above sea-level. The highest mountain is believed to be Gunong Tahan, which forms part of an isolated range on the eastern side, between Pahang and Kelantan, and is estimated at about 8000 ft. The west coast throughout its whole length is covered to a depth of some miles with mangrove swamps, with only a few isolated stretches of sandy beach, the dim foliage of the mangroves and the hideous mud flats presenting a depressing spectacle. On the east coast the force of the north-east monsoon, which beats upon the shores of the China Sea annually from November to February, has kept the land for the most part free from mangroves, and the sands, broken here and there by rocky headlands thickly wooded, and fringed by *casuarina* trees, stretch for miles without interruption. The islands on each coast present the features of the shore to which they are adjacent. On both the east and the west coast the islands are thickly wooded, but whereas the former are surrounded by beautiful sands and beaches, the latter are fringed by mangrove-swamps. The whole peninsula may be described as one vast forest, intersected in every direction by countless streams and rivers which together form the most lavish water-system in the world. Only an insignificant fraction of these forests has ever been visited by human beings, the Malays and even the aboriginal tribe having their homes on the banks of the rivers, and never, even when travelling from one part of the country to another, leaving the banks of a stream except for a short time when passing from one river-system to another. The bulk of the jungle, therefore, which lies between stream and stream, has never been trodden by the foot of man. The principal rivers on the west coast are the Perak, the Bernam and the Muar. The first-named is far finer than its fellows, and is navigable for steamers for about 40 m. from its mouth, and for native craft for over 250 m. It is exceedingly shallow, however, and is not of much importance as a waterway. The Bernam runs through flat swampy country for the greater part of its course, and steam-launches can penetrate to a distance of over 100 m. from its mouth, and it is therefore probably the deepest river. The country which it waters, however, is not of any value, and it is not much used. The Muar waters a very fertile valley, and is navigable for native boats for over 150 m. On the east coast the principal streams are the Petani, Telubin, Kelantan, Besut, Trengganu, Dungun, Kmamun, Kuantan, Pahang, Rompin, Endau and Sedeli, all guarded by difficult bars at their mouths, and dangerous during the continuance of the north-east monsoon. The deepest rivers are the Kuantan and Rompin; the largest are the Kelantan and the Pahang, both of which are navigable for native boats for a distance of over 250 m. The Trengganu river is obstructed by impassable rapids at a distance of about 30 m. from its mouth. The rivers on the east coast are practically the only highways, the Malays always travelling by boat in preference to walking, but they serve their purpose very indifferently, and their great beauty is their chief claim to distinction. Magnificent caves are found on both slopes of the peninsula, those at Batu in Selangor being the finest on the west coast, while those of Chadu and Koto Glanggi in Pahang are the most extensive yet visited by Europeans on the east coast. They are all of limestone formation. So far as is known, the Malay Peninsula consists of an axial zone of crystalline rocks, flanked on each side by an incomplete band of sedimentary deposits. Granite is the most widely spread of the crystalline rocks; but dikes of various kinds occur, and gneiss, schist and marble are also met with. These rocks form the greater part of the central range, and they are often—especially the granite—decomposed and rotten to a considerable depth. The sedimentary deposits include slate, limestone and sandstone. Impure coal has also been recorded. The limestone has yielded *Proetus*, *Chonetes* and other fossils, and is believed to be of Carboniferous age. In the sandstone Myophoria and other Triassic fossils have been found, and it appears to belong to the Rhaetic or Upper Trias.[1] The minerals produced are tin, gold, iron, galena and others, in insignificant quantities.

The tin occurs in the form of cassiterite, and is found chiefly in or near the crystalline rocks, especially the granite. As stream tin it occurs abundantly in some of the alluvial deposits derived from the crystalline area, especially on the west coast. Only two tin lodes are worked, however, and both are situated on the east coast, the one at Kuantan in Pahang, the other at Bandi in Trengganu territory. On the west coast no true lode has yet been discovered, though the vast alluvial deposits of tin found there seem to make such a discovery probable in the future. Since 1890 the tin produced from these alluvial beds has supplied between 50% and 75% of the tin of the world. Gold is worked with success in Pahang, and has been exploited from time immemorial by the natives of that state and of Kelantan. Small quantities have also been found on the western slope in Perak.

Climate, &c.—It was formerly the custom to speak of the Malay Peninsula as an unhealthy climate, and even to compare it with the west coast of Africa. It is now generally admitted, however, that, though hot, it compares favourably with that of Burma. The chief complaint which Europeans make concerning it is the extreme humidity, which causes the heat to be more oppressive than is the case where the air is dry. On the other hand, the thermometer, even at Singapore on the southern coast, which is the hottest portion of the peninsula, seldom rises above 98° in the shade, whereas the mean for the year at that place is generally below 80°. On the mainland, and more especially on the eastern slope, the temperature is cooler, the thermometer seldom rising above 93° in the shade, and falling at night below 70°. On an average day in this part of the peninsula the temperature in a European house ranged from 88° to 68°. The number of rainy days throughout the peninsula varies from 160 to over 200 in each year, but violent gusts of wind, called “Sumatras,” accompanied by a heavy downpour of short duration, are more common than persistent rain. The rainfall on the west coast varies from 75 to 120 in. per annum, and that of the east coast, where the north-east monsoon breaks with all its fury, is usually about 155 in. per annum. Malarial fevers make their appearance in places where the forest has been recently felled, or where the surface earth has been disturbed. It is noticed that labourers employed in deep mines worked by shafts suffer less from fever than do those who are engaged in stripping the alluvial deposits. This, of course, means that a new station, where clearing, digging, and building are in progress, is often unhealthy for a time, and to this must be attributed the evil reputation which the peninsula formerly enjoyed. To Europeans the climate is found to be relaxing and enervating, but if, in spite of some disinclination for exertion, regular exercise is taken from the beginning, and ordinary precautions

against chills, more especially to the stomach, are adopted, a European has almost as good a chance of remaining in good health in the peninsula as in Europe. A change of climate, however, is imperatively necessary every five or six years, and the children of European parents should not be kept in the peninsula after they have attained the age of four or five years. The Chinese immigrants suffer chiefly from fever of a malarial type, from beri-beri, a species of tropical dropsy, and from dysentery. The Malays formerly suffered severely from smallpox epidemics, but in the portion of the peninsula under British rule vaccination has been introduced, and the ravages of the disease no longer assume serious dimensions. Occasional outbreaks of cholera occur from time to time, and in the independent states these cause terrible loss of life, as the natives fly from the disease and spread the infection in every direction. As a whole, the Malays are, however, a remarkably healthy people, and deformity and hereditary diseases are rare among them. There is little leprosy in the peninsula, but there is a leper hospital near Penang on Pula Deraja and another on an island on the west coast for the reception of lepers from the Federated Malay States.

Flora and Fauna.—The soil of the peninsula is remarkably fertile both in the plains and on the mountain slopes. In the vast forests the decay of vegetable matter during countless ages has enriched the soil to the depth of many feet, and from it springs the most marvellous tangle of huge trees, shrubs, bushes, underwood, creepers, climbing plants and trailing vines, the whole hung with ferns, mosses, and parasitic growths, and bound together by rattans and huge rope-like trailers. In most places the jungle is so dense that it is impossible to force a way through it without the aid of a wood-knife, and even the wild beasts use well-worn game-tracks through the forest. In the interior brakes of bamboos are found, many of which spread for miles along the river banks. Good hard-wood timber is found in plenty, the best being the *merabau*, *penak*, *rasok* and *chengal*. Orchids of countless varieties abound. The principal fruit trees are the *duri-an*, mangosteen, custard-apple, pomegranate, *rambut-an*, *pulas-an*, *langsat*, *rambai*, jack-fruit, coco-nut, areca-nut, sugar-palm, and banana. Coffee, tobacco, sugar-cane, rice, pepper, gambier, cotton and sago are cultivated with success. Great developments have been made of recent years in the cultivation of rubber in British Malaya. The principal jungle products are gutta and rubber of several varieties, and many kinds of rattan. The mangrove grows on the shores of the west coast in profusion. Agilawood, the camphor tree, and ebony are also found in smaller quantities.

The fauna of the peninsula is varied and no less profuse than is the vegetable life. The Asiatic elephant; the *seladang*, a bison of a larger type than the Indian gaur; two varieties of rhinoceros; the honey bear (*bruang*), the tapir, the sambhur (*rusa*); the speckled deer (*kijang*), three varieties of mouse-deer (*napoh*, *plandok* and *kanchil*); the gibbon (*ungka* or *wawa'*), the *siamang*, another species of anthropoid ape, the *brok* or coco-nut monkey, so called because it is trained by the Malays to gather the nuts from the coco-nut trees, the *lotong*, *kra*, and at least twenty other kinds of monkey; the *binturong* (*arctictis binturong*), the lemur; the Asiatic tiger, the black panther, the leopard, the large wild cat (*harimau akar*), several varieties of jungle cat; the wild boar, the wild dog; the flying squirrel, the flying fox; the python, the cobra, and many other varieties of snake, including the hamadryad; the alligator, the otter and the gavial, as well as countless kinds of squirrel, rat, &c., are found throughout the jungles of the peninsula in great numbers. On the east coast peafowl are found, and throughout the interior the argus pheasant, the firebacked pheasant, the blue partridge, the adjutant-bird, several kinds of heron and crane, duck, teal, cotton-teal, snipe, wood-pigeon, green-pigeon of several varieties, swifts, swallows, pied-robins, hornbills, parakeets, fly-catchers, nightjars, and many other kinds of bird are met with frequently. A few specimens of solitary goose have been procured, but the bird is rarely met with. The forests literally swarm with insects of all kinds, from *cicadae* to beautiful butterflies, and from stick- and leaf-insects to endless varieties of ants. The scorpion and the centipede are both common. The study of the insect life of the peninsula opens a splendid field for scientific research, and the profusion and variety of insects found in these forests probably surpass those to be met with anywhere else in the world.

Political Divisions and Population.—Politically the Malay Peninsula is divided into four sections: the colony of the Straits Settlements and the Federated Malay States; the independent Malay State of Johor, which is within the British sphere of influence; the non-federated states under British protection; and the groups of states to the north of Perak and Pahang which are now recognized as lying within the sphere of influence of Siam. The colony of the Straits Settlements consists of the islands of Singapore, Penang and the Dindings, the territory of Province Wellesley, on the mainland opposite to Penang, the insignificant territory of the Dindings, and the town and territory of Malacca. The Federated Malay States under British protection consist of the sultanates of Perak, Selangor and the Negri Sambilan on the west coast, and the sultanate of Pahang on the east coast. Johor is the only Malay state in the southern portion of the peninsula, the whole of which is within the British sphere, which has been suffered to remain under native rule. The non-federated states under British protection (since 1909) are Kelantan, Trengganu, Kedah and Perlis (Palit). The population of the peninsula numbers about 2,000,000, of whom about 600,000 inhabit the colony of the Straits Settlements, about 900,000 the Federated Malay States, about 200,000 the Malay State of Johor, and about 250,000 to 300,000 the remainder of the peninsula. The population of the peninsula includes about 850,000 Chinese, mostly immigrants or descendants of immigrants from the southern provinces of China, of whom about 300,000 reside in the colony of the Straits Settlements, 365,000 in the Federated Malay States, 150,000 in Johor, and the remainder in smaller communities or as isolated traders scattered throughout the villages and small towns of the peninsula. The Malay population of the peninsula, including immigrants from the eastern archipelago, number some 750,000 to 800,000, while the Tamils and other natives of India number about 100,000, the aboriginal natives of the peninsula perhaps 20,000, Europeans and Americans about 6500, and Eurasians about 9000. The colony of the Straits Settlements, and to a lesser extent the towns of the Federated Malay States, carry a considerable heterogenous population, in which most of the races of Asia find their representatives.

Races of the Peninsula.—Excluding the Tai, or Siamese, who are undoubtedly recent intruders from the north, there are three races which for an extended period of time have had their home in the Malay Peninsula. These are the Semang or Pangan, the Sakai or Jakun, and the Malays. The Semang, as they are most usually called by the Malays, are Negritos—a small, very dark people, with features of the negroid type, very prognathous, and with short, woolly hair clinging to the scalp in tiny crisp curls. These people belong to the race which would seem to be the true aboriginal stock of southern Asia. Representatives of it are found scattered about the islands from the Andaman group southwards. The state of civilization to which they have attained is very low. They neither plant nor have they any manufactures except their rude bamboo and rattan vessels, the fish and game traps which they set with much skill, and the bows, blow-pipes and bamboo spears with which they are armed. They are skilful hunters, however, catch fish by ingeniously constructed traps, and live almost entirely on jungle-roots and the produce of their hunting and fishing. The most civilized of these people is found in Upper Perak, and the members of this clan have acquired some knowledge of the art of planting, &c. They cannot, however, be taken as typical of their race, and other specimens of this people are seldom seen even by the Sakai. From time to time they have been raided by the latter, and many Negritos are to be found in captivity in some of the Malayan villages on the eastern side of the peninsula. The mistake of speaking of the Sakai tribes as practically identical with the Semang or Pangan has very frequently been made, but as a matter of fact the two races are absolutely distinct from one another. It has also been customary to include the Sakai in the category of Malayan races, but this too is undoubtedly incorrect. The Sakai still inhabit in greatest numbers the country which forms the interior of Pahang, the Plus and Kinta districts of Perak, and the valley of Nenggiri in Kelantan. Representatives of their race are also found scattered among the Malayan villages throughout the country, and also along the coast, but these have intermixed so much with the Malays, and have acquired so many customs, &c., from their more civilized neighbours, that they can no longer be regarded as typical of the race to which they belong. The pure Sakai in the interior have a good knowledge of planting rice, tapioca, &c., fashion pretty vessels from bamboos, which they decorate with patterns traced by the aid of fire, make loin-cloths (their only garment) from the bark of the *trap* and *ipoh* trees; are very musical, using a rude lute of bamboo, and a nose-flute of a very sweet tone, and singing in chorus very melodiously; and altogether have attained in their primitive state to a higher degree of

civilization than have the Semang. They are about as tall as the average Malay, are slimly built, light of colour, and have wavy fine hair. In their own language they usually have only three numerals, viz. *na-nun*, one; *nar*, two; and *ne'*, three, or variants of these; all higher arithmetical ideas being expressed by the word *kerpn*, which means "many." A few cases have been recorded, however, of tribes who can count in their own tongue up to four and five. Among the more civilized, however, the Malay numerals up to ten are adopted by the Sakai. An examination of their language seems to indicate that it belongs to the Mon-Khmer group of languages, and the anthropological information forthcoming concerning the Sakai points to the conclusion that they show a greater affinity to the people of the Mon-Khmer races than to the Malayan stock. Though they now use metal tools imported by the Malays, it is noticeable that the names which they give to those weapons which most closely resemble in character the stone implements found in such numbers all over the peninsula are native names wholly unconnected with their Malay equivalents. On account of this, it has been suggested that in a forgotten past the Sakai were themselves the fashioners of the stone implements, and certain it is that all tools which have no representatives among the stone kelts are known to the Sakai by obvious corruptions of their Malayan names. The presence of the Sakai, a people of the Mon-Khmer stock, in the interior of the peninsula has also been considered as one of many proofs that the Malays intruded from the south and approached the peninsula by means of a sea-route, since had they swept down from the north, being driven thence by the people of a stronger breed, it might be expected that the fringe of country dividing the two contending races would be inhabited by men of the more feeble stock. Instead, we find the Sakai occupying this position, thus indicating that they have been driven northward by the Malays, and that the latter people has not been expelled by the Mon-Khmer races from the countries now represented by Burma, Siam and French Indo-China. The Sakai population is dying out, and must eventually disappear. (With regard to the Malay, see MALAYS.)

Archaeology.—The only ancient remains found in the peninsula are the stone implements, of which mention has already been made, and some remarkable ancient mines, which are situated in the Jelai valley in Pahang. The stone implements are generally of one or two types: a long rectangular adze or wedge rudely pointed at one end, and used in conjunction with a mallet or flat stone, and a roughly triangular axe-head, which has evidently been fixed in the cleft of a split stick. A few stones, which might perhaps be arrowheads, have been found, but they are very rare. The mines, which have been constructed for the purpose of working quartz lodes containing gold, are very extensive, and argue a high stage of civilization possessed by the ancient miners. They consist of a number of circular or rectangular pits sunk from the cap of a hill, and going down to a depth of in some cases as much as 120 ft., until in fact the miners have been stopped by being unable to cope with the quantity of water made when the level of the valley was reached. The shafts are placed so close together that in many instances they are divided by only a couple of feet of solid ground, but at their bases a considerable amount of gallery work has been excavated, though it is possible that this was done by miners who came after the people who originally sank the shafts. Native tradition attributes these mines to the Siamese, but no importance can be attached to this, as it is very general for the Malays to give this explanation for anything which is obviously not the work of their own ancestors. A theory, which seems to have some probability in its favour, is that these mines were worked by the Khmer people during the period of power, energy and prosperity which found its most lofty expression in the now ruined and deserted city of Angkor Thom; while another attributes these works to the natives of India whose Hindu remains are found in Java and elsewhere, whose influence was at one time widespread throughout Malayan lands, and of whose religious teaching remnants still linger in the superstitions of the Malays and are preserved in some purity in Lombok and Bali. In the absence, however, of any relics of a kind which might lead to the identification of the ancient miners, their nationality and origin are matters which must continue to be mere questions of speculation and conjecture.

History.—The first hint to reach Europe concerning the existence of habitable lands to the eastward of the Ganges is to be found in the writings of Pomponius Mela (A.D. 43) which speak of Chryse, or the Golden Isle, as lying off Cape Tamus—supposed to be the most easterly point in Asia—and over against the estuary of the Ganges. Thereafter there occur vague references to Chryse in the *Periplus of the Erythrean Sea*, &c., but the earliest trace of anything resembling first-hand knowledge concerning the peninsula of Indo-China and Malaya is revealed in the writings of Ptolemy, whose views were mainly derived from those of his predecessor Marinus of Tyre, who in his turn drew his deductions from information supplied to him by the mariner Alexander who, there is every reason to think, had himself voyaged to the Malay Peninsula and beyond. In the light of present knowledge concerning the trade-routes of Asia, which had been in existence for thousands of years ere ever Europeans attempted to make use of them, it is safe to identify Ptolemy's Sinus Perimulicus with the Gulf of Siam, the Sinus Sabaricus with the Straits of Malacca from their southern portals to the Gulf of Martaban, the Aurea Chersonesus with the Malay Peninsula, and the island of Iabadius or Sabadius—the reading of the name is doubtful—with Sumatra, not as has often been mistakenly attempted with Java. Although the first definite endeavour to locate the Golden Chersonese thus dates from the middle of the 2nd century of our era, the name was apparently well known to the learned of Europe at a somewhat earlier period, and in his *Antiquities of the Jews*, written during the latter half of the 1st century, Josephus says that Solomon gave to the pilots furnished to him by Hiram of Tyre commands "that they should go along with his stewards to the land that of old was called Ophir, but now the Aurea Chersonesus, which belongs to India, to fetch gold." After the time of Ptolemy no advance in knowledge concerning the geography of south-eastern Asia was made until Cosmas Indicopleustes, a monk and an Alexandrian Greek, wrote from personal knowledge between A.D. 530 and 550. His primary object was to prove that the world was built after the same shape and fashion as the Ark made by the Children of Israel in the desert; but he was able to show that the Malay Peninsula had to be rounded and thereafter a course steered in a northerly direction if China was to be reached. Meanwhile inter-Asiatic intercourse by means of sea-routes had been steadily on the increase since the discovery of the way to utilize the monsoons and to sail directly to and fro across the Indian Ocean (attributed to the Greek pilot Hippalus) had been made. After the decline of the power of Rome, the dominant force in Asiatic commerce and navigation was Persia, and from that time onward, until the arrival of the Portuguese upon the scene early in the 16th century the spice trade, whose chief emporia were in or near the Malay Peninsula, was in Persian or Arab hands. There is considerable reason to think, however, that the more frequent ports of call in the Straits of Malacca were situated in Sumatra, rather than on the shores of the Malay Peninsula, and two famous medieval travellers, Marco Polo and Ibn Batuta, both called and wintered at the former, and make scant mention of the latter.

The importance of the Malay Peninsula, as has been noted, consisted in the privilege which its locality conferred upon it of being the distributing centre of the spices brought thither from the Moluccas *en route* for India and Europe. As early as the 3rd century B.C. Megasthenes makes mention of spices brought to the shores of the Ganges from "the southern parts of India," and the trade in question was probably one of the most ancient in the world. So long, however, as India held the monopoly of the clove, the Malay Peninsula was ignored, the Hindus spreading their influence through the islands of the archipelago and leaving traces thereof even to this day. The Mahommedan traders from Persia and Arabia, following the routes which had been prepared for them by their forebears, broke down the Hindu monopoly and ousted the earlier exploiters so effectually that by the beginning of the 16th century the spice trade was almost exclusively in their hands. These traders were also missionaries of their religion, as indeed is every Mahommedan, and to them is due the conversion of the Malays from rude pantheism, somewhat tinctured by Hindu mythology, to the Mahommedan creed. The desire to obtain the monopoly of the spice trade has been a potent force in the fashioning of Asiatic history. The Moluccas were, from the first, the objective of the Portuguese invaders, and no sooner had the white men found their way round the Cape of Good Hope and established themselves successively upon the coast of East Africa, in the neighbourhood of the Gulf of Aden and the Malabar coast, than Malacca, then the chief trading centre of the Malayan Archipelago, became the object of their desire. The first Portuguese expedition sent out to capture Malacca was under the command of Diogo Lopez de Siqueira and sailed from Portugal in 1508. At Cochin Siqueira took on board certain adherents of Alphonso d'Alboquerque who were in bad odour with his rival d'Almeida, among them being Magellan, the future circumnavigator of the world, and Francisco Serrão, the first European who ever lived in the Spice Islands. Siqueira's expedition ended in failure, owing partly to the aggressive attitude of the Portuguese, partly to the very justifiable suspicions of the Malays, and he was presently forced to destroy one of his vessels, to leave a number of his men in captivity, and to sail direct for Portugal. In 1510 a second expedition against Malacca was sent out from Portugal under the command of Diogo Mendez de Vasconcellos, but d'Alboquerque retained it at Cochin to aid him in the retaking of Goa, and it was not until 1511 that the great viceroy could spare time to turn his attention to the scene of Siqueira's failure. After some futile negotiations, which had for their object the recovery of the Portuguese captives before hostilities should begin, an assault was delivered upon Malacca, and though the first attempt to take the city failed after some hard fighting, a second assault made some days later succeeded, and Malacca passed for ever into European hands. The Portuguese were satisfied with the possession of Malacca itself and did not seek further to extend their empire in Malaya. Instead they used every endeavour to establish friendly relations with the rulers of all the neighbouring kingdoms, and before d'Alboquerque returned to India he despatched embassies to China, Siam, and several kingdoms of Sumatra, and sent a small fleet, with orders to assume a highly conciliatory attitude toward all natives, in search of the Moluccas. Very soon the spice trade had become a Portuguese monopoly, and Malacca was the great headquarters of the trade. It should moreover be noted that Magellan's famous expedition had for its object not the barren feat of circumnavigation but the breaking down of this monopoly, without violating the terms of the papal bull which gave to Spain the conquest of the West, to Portugal the possession of the East. In 1528 a French expedition sailed from Dieppe, penetrated as far as Achin in Sumatra, but returned without reaching the Malay Peninsula. It was, however, the first attempt ever made to defy the papal bull. In 1591, three years 475
after the defeat of the Armada, Raymond and Lancaster rounded the Cape, and after cruising off Penang, decided to winter in Achin. They subsequently hid among the Pulau Sambilan near the mouth of the Perak river, and thence captured a large Portuguese vessel which was sailing from Malacca in company with two Burmese ships. In 1595 the first Dutch expedition sailed from the Texel, but it took a more southerly course than its predecessors and confined its operations to Java and the neighbouring islands. During this period Achin developed a determined enmity to the Portuguese, and more than one attempt was made to drive the strangers from Malacca. Eventually, in 1641, a joint attack was made by the Achinese and the Dutch, but the latter, not the people of the sturdy little Sumatran kingdom, became the owners of the coveted port. Malacca was taken from the Dutch by the British in 1795; was restored to the latter in 1818; but in 1824 was exchanged for Benkulen and a few more unimportant places in Sumatra. The first British factory in the peninsula was established in the native state of Patani on the east coast in 1613, the place having been used by the Portuguese in the 16th century for a similar purpose; but the enterprise came to an untimely end in 1620 when Captain Jourdain, the first president, was killed in a naval engagement in Patani Roads by the Dutch. Penang was purchased from Kedah in 1786, and Singapore from the then sultan of Johor in 1819. The Straits Settlements—Singapore, Malacca and Penang—were ruled from India until 1867, when they were erected into a crown colony under the charge of the Colonial Office. In 1874 the Malay state of Perak was placed under British protection by a treaty entered into with its sultan; and this eventually led to the inclusion in a British protectorate of the neighbouring Malay States of Selangor, Sungei Ujong, the cluster of small states called the Negri Sembilan and Pahang, which now form the Federated Malay States. By a treaty made between Great Britain and Siam in 1902 the northern Malay states of the peninsula were admitted to lie within the Siamese sphere of influence, but by a treaty of 1909 Siam ceded her suzerain rights over the states of Kelantan, Trengganu, Kedah and Perlis to Britain.

Singapore is the political, commercial and administrative headquarters of the colony of the Straits Settlements, and the governor for the time being is *ex officio* high commissioner of the Federated Malay States, British North Borneo, Sarawak, the Cocos-Keeling and Christmas Islands, and governor of Labuan.

See Sir F. Swettenham, *British Malaya* (1906); H. Clifford, *Further India* (1904); *Journal of the Malay Archipelago*, Logan (Singapore); *Journal of the Straits Branch of the Royal Asiatic Society* (Singapore); Weld, Maxwell, Swettenham and Clifford in the *Journal of the Royal Colonial Institute* (London); Clifford in the *Journal of the Royal Geographical Society* (London).

(H. Cl.)

1 See R. B. Newton, "Notes on Literature bearing upon the Geology of the Malay Peninsula; with an Account of a Neolithic Implement from that Country" (Geol. Mag., 1901, pp. 128-134). See also the various reports by J. B. Scrivenor in *Suppl. Perak Gov. Gazette*, 1905.

MALAYS, the name given by Europeans to the people calling themselves *Orang Malayu*, *i.e.* Malayan folk, who are the dominant race of the Malay Peninsula and of the Malay Archipelago. Broadly speaking, all the brown races which inhabit the portion of Asia south of Siam and Indo-China, and the islands from the Philippines to Java, and from Sumatra to Timor, may be described as belonging to the Malayan family, if the aboriginal tribes, such as the Sakai and Semang in the Malay Peninsula, the Bataks in Sumatra, and the Muruts in Borneo, be excepted. For the purposes of this article, however, only those among these races which bear the name of Orang Malayu, speak the Malayan language, and represent the dominant people of the land, can be included under the title of Malays. These people inhabit the whole of the Malayan Peninsula to the borders of lower Siam, the islands in the vicinity of the mainland, the shores of Sumatra and some portions of the interior of that island, Sarawak and Brunei in Borneo, and some parts of Dutch Borneo, Batavia and certain districts in Java, and some of the smaller islands of the archipelago. Though in these lands they have for not less than a thousand years enjoyed the position of the dominant race, they all possess a tradition that they are not indigenous, and that their first rulers "came out of the sea," with a large band of Malayan warriors in their train. In the peninsula especially, where the presence of the Malays is more recent than elsewhere, many traditions exist which point to a comparatively recent occupation of the country. It has been remarked that there is evidence that the Malays had attained to a certain stage of civilization before ever they set foot in Malaya. For instance, the names which they give to certain fruits, such as the *duri-an*, the *rambut-an* and the *pulas-an*, which are indigenous in the Malayan countries, and are not found elsewhere, are all compound words meaning respectively the thorny, the hairy and the twisted fruit. These words are formed by the addition of the substantial affix "*-an*," the use of which is one of the recognized methods by which the Malays turn primitive words into terms of more complex meaning. This may be taken to indicate that when first the Malays became acquainted with the fruits which are indigenous in Malayan lands they already possessed a language in which most primary words were represented, and also that their tongue had attained to a stage of development which provided for the formation of compound words by a system sanctioned by custom and the same linguistic instinct which causes a Malay to-day to form similar compounds from European and other foreign roots. For any aboriginal race inhabiting these countries, such important articles of diet as the *duri-an*, &c., could not fail to be among the first natural objects to receive a name, and thus we find primary terms in use among the Sakai and Semang, the aborigines of the Peninsula, to describe these fruits. The use by the Malays of artificially constructed terms to denote these things may certainly be taken to strengthen the opinion that the Malays arrived in the lands they now inhabit at a comparatively late period in their history, and at a time when they had developed considerably from the original state of primitive man.

In the Malay Peninsula itself there is abundant evidence, ethnological and philological, of at least two distinct immigrations of people of the Malayan stock, the earlier incursions, it is probable, taking place from the eastern archipelago to the south, the later invasion spreading across the Straits of Malacca from Sumatra at a comparatively recent date. The fact that the semi-wild tribes, which are ethnologically Malayan and distinct from the aboriginal Semang and Sakai, are met with almost invariably in the neighbourhood of the coast would seem to indicate that they reached the peninsula by a sea, not by a land route, a supposition which is strengthened by their almost amphibious habits. Many of these tribes have retained their pristine paganism, but many others it is certain have adopted the Mahommedan religion and have been assimilated by the subsequent and stronger wave of Sumatran immigrants. A study of the local dialects to be met with in some of the districts of the far interior, *e.g.* the Tembeling valley in Pahang, whose people are now Mahommedans and in many respects indistinguishable from the ordinary Malays of the peninsula, reveals the fact that words, current in the archipelago to the south but incomprehensible to the average peninsula Malays, by whom these more ancient populations are now completely surrounded, have been preserved as local words, whereas they really belong to an older dialect once spoken widely in the peninsula, as to-day it is spoken in the Malayan islands. This would seem to show that in some instances the earlier Malay immigrants fell or were driven by the later invaders back from the coast and sought refuge in the far interior.

Theories of Origin.

Until recently many eminent scientists held the theory that the Malayan peoples were merely an offspring of the Mongol stock, and that their advance into the lands they now inhabit had taken place from the cradle of the Mongolian race—that is to say, from the north. In the fifth edition of his *Malay Archipelago*, A. R. Wallace notes the resemblance which he traced between the Malays and the Mongolians, and others have recorded similar observations as to the physical appearance of the two races. To-day, however, fuller data are available than when Wallace wrote, and the more generally accepted theory is that the Malayan race is distinct, and came from the south, until it was stayed by the Mongolian races living on the mainland of southern Asia. The cranial measurements of the Malays and an examination of their hair sections seem to bear out the theory that they are distinct from the Mongolian races. Their language, which is neither monosyllabic nor tonic, has nothing in common with that of the Mon-Annam group. It has, moreover, been pointed out that had the Malays been driven southwards by the stronger races of the mainland of Asia, it might be expected that the people inhabiting the country nearest to the border between Siam and Malaya would belong to the Malayan and not to the Mon-Annam or Mon-Khmer stock. As a matter of fact the Sâkai of the interior of the peninsula belong to the latter race. It might also be anticipated, were the theory of a southward immigration to be sustained, that the Malays would be new-comers in the islands of the archipelago, and have their oldest settlements on the Malayan Peninsula. The facts, however, are in exact contradiction to this; and accordingly the theory now most generally held by those who have studied the question is that the Malays form a distinct race, and had their original home in the south. Where this home lay it is not easy to say, but the facts recorded by many writers as to the resemblance between the Polynesian and the Malayan races, and the strong Malayan element found in the languages of the former (see Tregear's *Maori and Comparative Polynesian Dictionary*, London, 1891), have led some students to think that the two races may have had a common origin. John Crawfurd, in the Dissertation to his *Dictionary of the Malay Language*, published in 1840, noted the prevalence of Malayan terms in the Polynesian languages, and attributed the fact to the casting away of ships manned by Malays upon the islands of the Polynesian Archipelago. The appearance of the same Malayan words in localities so widely separated

from each other, however, cannot be satisfactorily accounted for by any such explanation, and the theory is now more generally held that the two races are probably allied and may at some remote period of history have shared a common home. It has been suggested that their separation did not take place until after the continent which once existed in the north Pacific had become submerged, and that the Malays wandered northward, while the Polynesian race spread itself over the islands of the southern archipelago. All this, however, must necessarily be of the nature of the purest speculation, and the only facts which we are able to deduce in the present state of our knowledge of the subject may be summed up as follows: (*a*) That the Malays ethnologically belong to a race which is allied to the Polynesians; (*b*) that the theory formerly current to the effect that the Sakai and other similar races of the peninsula and archipelago belonged to the Malayan stock cannot be maintained, since recent investigations tend to identify them with the Mon-Annam or Mon-Khmer family of races; (*c*) that the Malays are, comparatively speaking, new-comers in the lands which they now inhabit; (*d*) that it is almost certain that their emigration took place from the south; (*e*) and that, at some remote period of their history, they came into close contact with the Polynesian race, probably before its dispersion over the extensive area which it now occupies.

Religion and Superstitions.

The Malays to-day are Sunni Mahommedans of the school of Shafi'i, and they habitually use the terms *Orang Malayu*, *i.e.* a Malay, and *Orang Islam*, *i.e.* a Mahommedan, as synonymous expressions. Their conversion from paganism took place during the 13th, 14th and 15th centuries of our era. The raja of Achin, in northern Sumatra, is said to have been converted as early as 1206, while the Bugis people in Celebes are supposed not to have become Mahommedans until 1495. Mahommedanism undoubtedly spread to the Malays of the peninsula from Sumatra, but their conversion was slow and gradual, and may even now in some respects be regarded as imperfect. Upon the bulk of the Malayan peoples their religion sits but lightly. Few are found to observe the law concerning the Five Hours of Prayer, and many fail to put in an appearance at the Friday congregational services in the mosques. The Fast of Ramadhān, however, is generally observed with some faithfulness. Compared with other Mahommedan peoples, the Malays are not fanatical, though occasionally an outbreak against those of a different creed is glorified by them into a holy war. The reason of such outbreaks, however, is usually to be found in political and social rather than in religious grievances. Prior to their conversion to Mahommedanism the Malays were subjected to a considerable Hindu influence, which reached them by means of the traders who visited the archipelago from India. In the islands of Bali and Lombok the people still profess a form of Hinduism, and Hindu remains are to be found in many other parts of the archipelago, though their traces do not extend to the peninsula. Throughout, however, the superstitions of the Malays show indications of this Hindu influence, and many of the demons whom their medicine-men invoke in their magic practices are clearly borrowed from the pantheon of India. For the rest, a substratum of superstitious beliefs, which survives from the days when the Malays professed only their natural religion, is to be found firmly rooted in the minds of the people, and the influence of Mahommedanism, which regards such things with horror, has been powerless to eradicate this. Mr W. W. Skeat's *Malay Magic* (London, 1900) is a compilation of all the writings on the subject of Malay superstitions by the best authorities and contains considerable original matter.

Mode of Life, &c.

The Malays of the coast are a maritime people, and were long famous for the daring character of their acts of piracy. They are now peaceable fisher-folk, who show considerable ingenuity in their calling. Inland the Malays live by preference on the banks of rivers, building houses on piles some feet from the ground, and planting groves of coco-nut, betel-nut, sugar-palm and fruit-trees around their dwellings. Behind their villages the rice-fields usually spread, and rice, which is the staple food of the people, is the principal article of agriculture among them. Sugar-cane, maize, tapioca and other similar products are grown, however, in smaller quantities. In planting rice three methods are in use: the cultivation of swamp-rice in irrigated fields; the planting of ploughed areas; and the planting of hill-rice by sowing each grain separately in holes bored for the purpose. In the irrigated fields the rice plants are first grown in nurseries, and are subsequently transplanted when they have reached a certain stage of development. The Malays also work jungle produce, of which the most important are gutta, rattans, agila wood, camphor wood, and the beautiful *kamuning* wood which is used by the natives for the hilts of their weapons. The principal manufactures of the Malays are cotton and silk cloths, earthenware and silver vessels, mats and native weapons. The best cotton cloths are those manufactured by the Bugis people in Celebes, and the *batek* cloths which come from Java and are stamped with patterns. The best silks are produced by the natives of Pahang, Kĕlantan and Johor in the Malay Peninsula. Lord Leighton pronounced the silver ware from Malaya to be the most artistic of any exhibited at the Colonial Exhibition held in London in 1886. The pottery of the Malays is rude but curious. When the first Europeans visited the Malay Archipelago the Malays had already acquired the art of manufacturing gunpowder and forging cannon. The art of writing also appears to have been independently invented by the Malayan races, since numerous alphabets are in use among the peoples of the archipelago, although for the writing of Malay itself the Arabic character has been adopted for some hundreds of years. The Malays are excellent boat-builders.

Character, &c.

While the Malays were famous almost exclusively for their piratical expeditions they naturally bore an evil reputation among Europeans, but now that we have come into closer contact with them, and have learned to understand them better, the old opinions concerning them have been greatly modified. They used to be described as the most cruel and treacherous people in the world, and they certainly are callous of the pain suffered by others, and regard any strategy of which their enemies are the victims with open admiration. In ordinary circumstances, however, the Malay is not treacherous, and there are many instances recorded in which men of this race have risked their own lives on behalf of Europeans who chanced to be their friends. As a race they are exceedingly courteous and self-respecting. Their own code of manners is minute and strict, and they observe its provisions faithfully. Unlike many Orientals, the Malays can be treated with a friendly familiarity without such treatment breeding lack of respect or leading to liberties being taken with the superior. The Malays are indolent, pleasure-loving, improvident beyond belief, fond of bright clothing, of comfort, of ease, and they dislike toil exceedingly. They have no idea of the value of money, and little notion of honesty where money is concerned. They would always borrow rather than earn money, and they feel no shame in adopting the former course. They will frequently refuse to work for a wage when they most stand in need of cash, and yet at the invitation of one who is their friend they will toil unremittingly without any thought of reward. They are much addicted to gambling, and formerly were much given to fighting, though they never display that passion for war in the abstract which is characteristic of some of the white races, and their courage on the whole is not high if judged by European standards. It is notorious, however, on the coasts that a Malay gang on board a ship invariably gets the better

of any fight which may arise between it and the Chinese crew. The sexual morality of the Malays is very lax, but prostitution is not common in consequence. Polygamy, though allowed by their religion, is practised for the most part among the wealthy classes only. The Malays are an intensely aristocratic people, and show a marvellous loyalty to their rajas and chiefs. Their respect for rank is not marred by any vulgarity or snobbery. The ruling classes among them display all the vices of the lower classes, and few of the virtues except that of courtesy. They are for the most part, when left to their own resources, cruel, unjust, selfish and improvident.

Much has been written concerning the acts of homicidal mania called amuck (*amok*), which word in the vernacular means to attack. It was formerly believed that these outbursts were to be attributed to madness *pur et simple*, and some cases of *amok* can certainly be traced to this source. These are not, however, in any sense typical, and might equally have been perpetrated by men of another race. The typical *amok* is usually the result of circumstances which render a Malay desperate. The motive is often inadequate from the point of view of a European, but to the Malay it is sufficient to make him weary of life and anxious to court death. Briefly, where a man of another race might not improbably commit suicide, a Malay runs *amok*, killing all whom he may meet until he himself is slain.

The nervous affliction called *latah*, to which many Malays are subject, is also a curious trait of the people. The victims of this affliction lose for the time all self-control and all sense of their own identity, imitating the actions of any person who chances to rivet their attention. Accounts of these manifestations will be found in Swettenham's *Malay Sketches* (London, 1895) and Clifford's *Studies in Brown Humanity* (London, 1897).

The Malays wear a loose coat and trousers, and a cap or head-kerchief, but the characteristic item of their costume is the *sarong*, a silk or cotton cloth about two yards long by a yard and a quarter wide, the ends of which are sewn together, forming a kind of skirt. This is worn round the waist folded in a knot, the women allowing it to fall to the ankle, the men, when properly dressed in accordance with ancient custom, folding it over the hilt of their waist-weapon, and draping it around them so that it reaches nearly to the knee. In the hall of a raja on state occasions a head-kerchief twisted into a peak is worn, and the coat is furnished with a high collar extending round the back of the neck only. This coat is open in front, leaving the chest bare. The trousers are short and of a peculiar cut and material, being coloured many hues in parallel horizontal lines. The *sarong* is of Celebes manufacture and made of cotton, to the surface of which a high polish is imparted by friction with a shell. The typical fighting costume of the Malay is a sleeveless jacket with texts from the Koran written upon it, short tight drawers reaching to the middle of the thigh, and the *sarong* is then bound tightly around the waist, leaving the hilt of the dagger worn in the girdle exposed to view. The principal weapon of the Malays is the *kris*, a short dagger with a small wooden or ivory handle, of which there are many varieties. The blade of a *kris* may either be wavy or straight, but if wavy the number of waves must always be uneven in number. The *kris* most prized by the Malays are those of Bugis (Celebes) manufacture, and of these the kind called *tuasek* are of the greatest value. Besides the short *kris*, the Malays use long straight *kris* with very narrow blades, shorter straight *kris* of the same form, short broad swords called *sundang*, long swords of ordinary pattern called *pedang*, somewhat shorter swords curved like scimitars with curiously carved handles called *chenangkas*, and short stabbing daggers called *tumbok lada*. The principal tools of the Malays are the *parang* or *gôlok*, a heavy knife used in the jungle, without which no peasant ever stirs abroad from his house, the *beliong* or native axe, and the *pisau raut*, which is used for scraping rattan. Their implements are very primitive, consisting of a plough fashioned from a fork of a tree, and a rude harrow. Reaping is usually performed by the aid of a curious little knife which severs each ear of grain separately. The fisher-folk use many kinds of nets, which they manufacture themselves. Sails, paddles, oars and punting-poles are all in use.

Costume, Weapons, &c.

Malay Language and Literature

The Malay language is a member of the Malayan section of the Malayo-Polynesian class of languages, but it is by no means a representative type of the section which has taken its name from it. The area over which it is spoken comprises the peninsula of Malacca with the adjacent islands (the Rhio-Lingga Archipelago), the greater part of the coast districts of Sumatra and Borneo, the seaports of Java, the Sunda and Banda Islands. It is the general medium of communication throughout the archipelago from Sumatra to the Philippine Islands, and it was so upwards of three hundred and fifty years ago when the Portuguese first appeared in those parts.

There are no Malay manuscripts extant, no monumental records with inscriptions in Malay, dating from before the spreading of Islam in the archipelago, about the end of the 13th century. By some it has been argued from this fact that the Malays possessed no kind of writing prior to the introduction of the Arabic alphabet (W. Robinson, J. J. de Hollander); whereas others have maintained, with greater show of probability, that the Malays were in possession of an ancient alphabet, and that it was the same as the Rechang (Marsden, Friederich), as the Kawi (Van der Tuuk), or most like the Lampong (Kern)—all of which alphabets, with the Battak, Bugi and Macassar, are ultimately traceable to the ancient Cambojan characters. With the Mahommedan conquest the Perso-Arabic alphabet was introduced among the Malays; it has continued ever since to be in use for literary, religious and business purposes. Where Javanese is the principal language, Malay is sometimes found written with Javanese characters; and in Palembang, in the Mĕnangkabo country of Middle Sumatra, the Rechang or Renchong characters are in general use, so called from the sharp and pointed knife with which they are cut on the smooth side of bamboo staves. It is only since the Dutch have established their supremacy in the archipelago that the Roman character has come to be largely used in writing and printing Malay. This is also the case in the Straits Settlements.

By the simplicity of its phonetic elements, the regularity of its grammatical structure, and the copiousness of its nautical vocabulary, the Malay language is singularly well fitted to be the *lingua franca* throughout the Indian archipelago. It possesses the five vowels *a*, *i*, *u*, *e*, *o*, both short and long, and one pure diphthong, *au*. Its consonants are *k*, *g*, *ng*, *ch*, *j*, *ñ*, *t*, *d*, *n*, *p*, *b*, *m*, *y*, *r*, *l*, *w*, *s*, *h*. Long vowels can only occur in open syllables. The only possible consonantal nexus in purely Malay words is that of a nasal and mute, a liquid and mute and vice versa, and a liquid and nasal. Final *k* and *h* are all but suppressed in the utterance. Purely Arabic letters are only used in Arabic words, a great number of which have been received into the Malay vocabulary. But the Arabic character is even less suited to Malay than to the other Eastern languages on which it has been foisted. As the short vowels are not marked, one would, in seeing, *e.g.* the word *bntng*, think first of *bintang*, a star; but the word might also mean a large scar, to throw down, to spread, rigid, mutilated, enceinte, a kind of cucumber, a redoubt, according as it is pronounced, *bantang*, *banting*, *bentang*, *buntang*, *buntung*, *bunting*, *bonteng*, *benteng*.

Malay is essentially, with few exceptions, a dissyllabic language, and the syllabic accent rests on the penultimate unless that syllable is open and short; *e.g.* dātang, namáña, bĕsár, diumpatkanñálah. Nothing in the form of a root word indicates the grammatical category to which it belongs; thus, *kāsih*, kindness, affectionate, to love; *ganti*, a proxy, to exchange, instead of. It is only in derivative words that this vagueness is avoided. Derivation is effected by infixes, prefixes, affixes and reduplication. Infixes occur more rarely in Malay than in the cognate tongues. Examples are—*gūruh*, a rumbling noise, *gumūruh*, to make such a noise; *tunjuḳ*, to point, *telunjuḳ*, the forefinger; *chūchuk*, to pierce, *cherūchuḳ*, a stockade. The import of the prefixes —mĕ (mĕng, mĕñ, mĕn, mĕm), pĕ (pĕng, pĕñ, pĕn, pĕm bĕr (bĕl), pĕr, pĕl, ka, di, tĕr,—and affixes—an, kan, i, lah—will best appear from the following examples—root word *ājar*, to teach, to learn; *mĕngājar*, to instruct (expresses an action); *blĕājar*, to study (state or condition); *mĕngajāri*, to instruct (some one, trans.); *mĕngājarkan*, to instruct (in something, causative); *pĕngājar*, the instructor; *pĕlājar*, the learner; *pĕngajāran*, the lesson taught, also the school; *pĕlajāran*, the lesson learnt; *diājar*, to be learnt; *terājar*, learnt; *tĕrājarkan*, taught; *tĕrajāri*, instructed; *[pĕrāja* (from *rāja*, prince), to recognize as prince; *pĕrajākan*, to crown as prince; karajāan, royalty]; *ājarkanlah*, teach! Examples of reduplication are—*ājar-ājar*, a sainted person; *ājar-bĕrājar* (or *bĕlājar*), to be learning and teaching by turns; similarly there are forms like *ājar-mĕngājar*, *bĕrājār-ajāran*, *ājar-ajāri*, *mĕmpĕrājar*, *mĕmpĕrājarkan*, *mĕmpĕrajāri*, *tĕrbĕlājarkan*, *pĕrbĕlājarkan*, &c. Altogether there are upwards of a hundred possible derivative forms, in the idiomatic use of which the Malays exhibit much skill. See especially H. von Dewall, *De vormveranderingen der Maleische taal* (Batavia, 1864) and I. Pijnappel, *Maleisch-Hollandsch Woordenboek* (Amsterdam, 1875), “Inleiding.” In every other respect the language is characterized by great simplicity and indefiniteness. There is no inflexion to distinguish number, gender or case. Number is never indicated when the sense is obvious or can be gathered from the context; otherwise plurality is expressed by adjectives such as *sagāla*, all, and *bāñak*, many; more rarely by the repetition of the noun, and the indefinite singular by *sa* or *sātu*, one, with a class-word. Gender may, if necessary, be distinguished by the words *laki-lāki*, male, and *pĕrampūan*, female, in the case of persons, and of *jantan* and *bĕtīna* in the case of animals. The genitive case is generally indicated by the position of the word after its governing noun. Also adjectives and demonstrative pronouns have their places after the noun. Comparison is effected by the use of particles. Instead of the personal pronouns, both in their full and abbreviated forms, conventional nouns are in frequent use to indicate the social position or relation of the respective interlocutors, as, *e.g. hamba tuan*, the master’s slave, *i.e.* I. These nouns vary according to the different localities. Another peculiarity of Malay (and likewise of Chinese, Shan, Talaing, Burmese and Siamese) is the use of certain class-words or coefficients with numerals, such as *orang* (man), when speaking of persons, *ekor* (tail) of animals, *kĕping* (piece) of flat things, *bīji* (seed) of roundish things; *e.g. līma bīji, tĕlor*, five eggs. The number of these class-words is considerable. Malay verbs have neither person or number nor mood or tense. The last two are sometimes indicated by particles or auxiliary verbs; but these are generally dispensed with if the meaning is sufficiently plain without them. The Malays avoid the building up of long sentences. The two main rules by which the order of the words in a sentence is regulated are—subject, verb, object; and qualifying words follow those which they qualify. This is quite the reverse of what is the rule in Burmese.

The history of the Malays amply accounts for the number and variety of foreign ingredients in their language. Hindus appear to have settled in Sumatra and Java as early as the 4th century of our era, and to have continued to exercise sway over the native populations for many centuries. These received from them into their language a very large number of Sanskrit terms, from which we can infer the nature of the civilizing influence imparted by the Hindu rulers. Not only in words concerning commerce and agriculture, but also in terms connected with social, religious and administrative matters that influence is traceable in Malay. See W. E. Maxwell, *Manual of the Malay Language* (1882), pp. 5-34, where this subject is treated more fully than by previous writers. This Sanskrit element forms such an integral part of the Malay vocabulary that in spite of the subsequent infusion of Arabic and Persian words adopted in the usual course of Mahommedan conquest it has retained its ancient citizenship in the language. The number of Portuguese, English, Dutch and Chinese words in Malay is not considerable; their presence is easily accounted for by political or commercial contact.

The Malay language abounds in idiomatic expressions, which constitute the chief difficulty in its acquisition. It is sparing in the use of personal pronouns, and prefers impersonal and elliptical diction. As it is rich in specific expressions for the various aspects of certain ideas, it is requisite to employ always the most appropriate term suited to the particular aspect. In Maxwell’s *Manual*, pp. 120 seq., no less than sixteen terms are given to express the different kinds of striking, as many for the different kinds of speaking, eighteen for the various modes of carrying, &c. An unnecessary distinction has been made between *High Malay* and *Low Malay*. The latter is no separate dialect at all, but a mere brogue or jargon, the medium of intercourse between illiterate natives and Europeans too indolent to apply themselves to the acquisition of the language of the people; its vocabulary is made up of Malay words, with a conventional admixture of words from other languages; and it varies, not only in different localities, but also in proportion to the individual speaker’s acquaintance with Malay proper. A few words are used, however, only in speaking with persons of royal rank —*e.g. santap*, to eat (of a raja) instead of *mākan*; *bĕrādu*, to sleep, instead of tī*dor*; *gring*, unwell, instead of *sākit*; *mangkat*, to die, instead of *māti*, &c. The use is different as regards the term *Jāwī* as applied to the Malay language. This has its origin in the names Great Java and Lesser Java, by which the medieval Java and Sumatra were called, and it accordingly means the language spoken along the coasts of the two great islands.

Literature.

The Malays cannot, strictly speaking, be said to possess a literature, for none of their writings can boast any literary beauty or value. Their most characteristic literature is to be found, not in their writings, but in the folk-tales which are transmitted orally from generation to generation, and repeated by the wandering minstrels called by the people *Pĕng-līpor Lāra*, *i.e.* “Soothers of Care.” Some specimens of these are to be found in the *Journal of the Straits Branch of the Asiatic Society* (Singapore). The collections of *Malay Proberbs* made by Klinkert, Maxwell and Clifford also give a good idea of the literary methods of the Malays. Their verse is of a very primitive description, and is chiefly used for purposes of love-making. There are numerous rhymed fairy tales, which are much liked by the people, but they are of no literary merit. The best Malay books are the *Hikāyat Hang Tūak*, *Bĕstāmam* and the *Hikāyat Abdullah*. The latter is a diary of events kept during Sir Stamford Raffle’s administration by his Malay scribe.

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(H. Cl.)

MALAY STATES (British).

The native states of the Malay Peninsula under British protection are divided into two groups: (1) federated, and (2) non-federated.

I.—Federated States

The federated states, under the protection of Great Britain, but not British possessions, are Perak, Selangor and the confederation of small states known as the Negri Sembilan (*i.e.* Nine States) on the west coast, and the state of Pahang on the east coast. Each state is under the rule of a sultan, who is assisted in his legislative duties by a state council, upon which the resident, and in some cases the secretary to the resident, has a seat, and which is composed of native chiefs and one or more Chinese members nominated by the sultan with the advice and consent of the resident. The council, in addition to legislative and other duties, revises all sentences of capital punishment. The administrative work of each state is carried on by the resident and his staff of European officials, whose ranks are recruited by successful candidates in the competitive examinations held annually by the Civil Service commissioners. The sultan of each state is bound by treaty with the British government to accept the advice of the resident, who is thus practically paramount; but great deference is paid to the opinions and wishes of the sultans and their chiefs, and the British officials are pledged not to interfere with the religious affairs of the Mahommedan community. In the actual administration of the Malay population great use is made of the native aristocratic system, the peasants being governed largely by their own chiefs, headmen and village elders, under the close supervision of British district officers. The result is a benevolent autocracy admirably adapted to local conditions and to the character and traditions of the people. A recognition of the fact that the welfare of the Malays, who are the people of the land and whose sultans have never ceded their territories to the British, must be regarded as the first consideration has been the guiding principle of the administration of the Malay States, and this has resulted in an extraordinary amelioration of the condition of the natives, which has proceeded concurrently with a notable development of the country and its resources, mineral and agricultural. To the work of development, however, the Malays have themselves contributed little, sound administration having been secured by the British officials, enterprise and capital having been supplied mainly by the Chinese, and the labour employed being almost entirely Chinese or Tamil. Meanwhile the Malays have improved their ancestral holdings, have enjoyed a peace and a security to which their past history furnishes no parallel, have obtained easy access to new and important markets for their agricultural produce, and for the rest have been suffered to lead the lives best suited to their characters and their desires. Each principal department of the administration has its federal head, and all the residents correspond with and are controlled by the resident-general, who, in his turn, is responsible to the high commissioner, the governor of the Straits Settlements for the time being.

The estimated aggregate area of the Federated Malay States is 28,000 sq. m., and the estimated population in 1905 was 860,000, as against 678,595 in 1901. Of these only about 230,000 are Malays. The revenue of the federation in 1905 was $23,964,593 (about £2,795,000), and the expenditure was $20,750,395 (about £2,460,000). The imports for the same year were valued at $50,575,455 (about £5,900,000), and the exports at $80,057,654 (about £9,340,000), making a total trade of nearly 15¼ millions sterling. The principal sources of revenue are an export duty on tin, the rents paid for the revenue farms of the right to collect import duties on opium, wine and spirits, and to keep licensed gambling-houses for the exclusive use of the Chinese population, railway receipts, land and forest revenue and postal revenue. The tin is won from large alluvial deposits found in the states of the western seaboard, and the mines are worked almost exclusively by Chinese capital and labour. Since 1889 the Federated Malay States have produced considerably more than half the tin of the world. Recently there has been a great development in agricultural enterprise, especially with regard to rubber, which is now grown in large quantities, the estates being mainly in the hands of Europeans, and the labour mostly Tamil. The states are opened up by over 2500 m. of some of the best metalled cart-roads in the world, and by a railway system, 350 m. of which, extending from the mainland opposite Penang to the ancient town of Malacca, are open to traffic. Another 150 m. of railway is under construction. The government offices at Kuala Lumpor, the federal capital of the states, are among the finest buildings of the kind in Asia. The whole of this extraordinary development, it should be noted, has been effected by careful, sound and wise administration coupled with a courageous and energetic policy of expenditure upon public works. Throughout, not one penny of debt has been incurred, the roads, railways, &c., being constructed entirely from current balances. This of course has only been rendered possible by the extraordinary mineral wealth which the states on the western seaboard have developed in the hands of Chinese miners amid the peace and security which British rule has brought to these once lawless lands. The value of the tin output for the year 1905 amounted to $69,460,993 (£8,104,199). Although agricultural enterprise in the Malay States is assuming considerable proportions and a growing importance, the total value of the principal agricultural products, including timber, for the year 1905 only aggregated $2,435,513 (£289,143).

The whole of the Malay Peninsula is one vast forest, through which flow countless streams that form one of the most lavish water-systems in the world. The rivers, though many of them are of imposing appearance and

of considerable length, are uniformly shallow, only a few on the west coast being navigable by ships for a distance of some 40 m. from their mouths. In spite of the notable development above referred to, only a very small fraction of the entire area of the states has as yet been touched either by mining or agricultural enterprise. It is not too much to assert that the larger half of the forest-lands has never been trodden by the foot of man. (For information concerning the botany, geology, &c., of the Malay States see Malay Peninsula. For the ethnology see Malays.)

Perak is situated between the parallels 3° 37′ and 6° 5′ N. and 100° 3′ to 101° 51′ E. on the western side of the Malay Peninsula. It is bounded on the N. by the British possession of Province Wellesley and the Malay state of Kedah; on the S. by the protected native state of Selangor; on the E. by the protected native state of Pahang and the independent states of Kelantan and Petani; and on the W. by the Straits of Malacca. The coast-line is about 90 m. in length. The extreme distance from the most northerly to the most southerly portions of the state is about 172 m., and the greatest breadth from east to west is about 100 m. The total area of the country is estimated at about 10,000 sq. m.

The Perak river, which runs in a southerly direction almost parallel with the coast for nearly 150 m. of its course, is navigable for small steamers for about 40 m. from its mouth, and by native trading boats for nearly 200 m. The Plus, Batang, Padang and Kinta rivers are its principal tributaries, all of them falling into the Perak on its left bank. The other principal rivers of the state are the Krian, Kurau, Larut and Bruas to the north of the mouth of the Perak, and the Bernam to the south. None of these rivers is of any great importance as a waterway, although the Bernam River is navigable for small steamers for nearly 100 m. of its course. The mountain ranges, which cover a considerable area, run from the north-east to the south-west. The highest altitudes attained by them do not exceed 7500 ft., but they average about 2500 ft. They are all thickly covered with jungle. The ranges are two, running parallel to one another, with the valley of the Perak between them. The larger is a portion of the main chain, which runs down the peninsula from north to south. The lesser is situated in the district of Larut. There are several hill sanatoria in the state at heights which vary from 2500 to 4700 ft. above sea-level, but the extreme humidity of the atmosphere renders the coolness thus obtainable the reverse of enjoyable.

Geology.

Mr Leonard Wray, curator of the Perak museum, writes as follows on the subject of the geological formation of the state: “There are really only four formations represented—firstly, the granitic rocks; secondly, a large series of beds of gneiss, quartzite, schist and sandstone, overlaid in many places by thick beds of crystalline limestone; thirdly, small sheets of trap rock; and fourthly, river-gravels and other Quaternary deposits. The granites are of many varieties, and also, in all probability, of several different geological periods. The series of quartzites, schists, and limestone are of great age, but as no fossils have ever been found in any of them, nothing definite can be stated as to their exact chronological position. Their lithological characteristics and the total absence of all organic remains point to the Archaean period. The failure to discover signs of life in them is, of course, merely negative evidence, and the finding of a single fossil would at once upset it. However, until this happens they may be conveniently classed as Laurentian. It is at present impossible to form anything approaching an accurate estimate of the thickness of this extensive series, but it is probable that it is somewhere between 4000 and 5000 ft. Unconformability has been noticed between the limestones and the beds beneath, but whether this is sufficient to separate them or not is a matter for future investigation.... The taller hills are exclusively composed of granite, as also are some of the lower ones.... The ores of the following metals have been found in the formations named: Granite—tin, lead, iron, arsenic, tungsten and titanium; Laurentian—tin, gold, lead, silver, iron, arsenic, copper, zinc, tungsten, manganese and bismuth; Quaternary—tin, gold, copper, tungsten, iron and titanium. This is not to be considered a complete list, as small quantities of other metals have also been found.”

History.

The early history of Perak is obscure, the only information on the subject being obtained from native traditions, which are altogether untrustworthy. According to these authorities, however, a settlement was first made by Malays in Perak at Bruas, and the capital was later moved to the banks of the Perak River, the site chosen being a little village called Temong, which lies some miles up stream from Kuala Kangsar, the present residence of the sultan. When the Malacca sultanate fell, owing to the invasion of the Portuguese in 1511, a member of that royal house is said to have migrated to Perak, and the present dynasty claims to have been descended from him. As this boast is also made by almost every ruling family in the peninsula, the tradition is not worthy of any special attention. What is more certain is the tradition that Perak was twice invaded by the Achinese, and its rulers carried off into captivity, one of them, Sultan Mansur Shah, subsequently becoming the ruler of Achin. The first European settlement in Perak was made by the Dutch in 1650, under a treaty entered into with the Achinese, but the natives of the country rose against the Dutch again and again, and it was abandoned in 1783, though it was afterwards reoccupied, the Dutch being finally ejected by the British in 1795. In 1818 the Siamese conquered Perak, but its independence was secured by a treaty between the British and Siamese governments in 1824. From that date until 1874 Perak was ruled by its own sultans, but in that year, owing to internal strife, Sultan Abdullah applied to the then governor of the Straits Settlements, Sir Andrew Clarke, for the assistance of a British Resident. The treaty of Pangkor was concluded on the 20th of January 1874, and the first resident, Mr J. W. W. Birch, was murdered on the 2nd of November 1875. A punitive expedition became necessary; sultan Abdullah and the other chiefs concerned in the murder were banished, the actual murderers were hanged, and Raja Muda Jusuf was declared regent. He died in 1888, and was succeeded by the sultan Raja Idris, K.C.M.G., a most enlightened ruler, who was from the first a strong and intelligent advocate of British methods of administration. Sir Hugh Low was appointed resident, a position which he held until 1889, when he was succeeded by Sir Frank Swettenham. Since then the history of Perak has been one of continuous peace and growing prosperity and wealth. Although the federal capital is Kuala Lumpor in Selangor, Perak still enjoys the honour of being the senior and leading state of the federation.

Population.

By the census taken on the 5th of April 1891 the population of Perak was shown to be as follows: Europeans, 366; Eurasians, Jews and Armenians, 293; Malays, 96,719; Chinese, 94,345; Tamils, 13,086; aborigines, 5779; other nationalities, 3666; thus making a grand total of 214,254, of whom 156,408 were males and 57,846 were females. The estimated population in 1905 was 400,000, of whom 200,000 were Chinese and 160,000 were Malays, but owing to the disparity of the proportions between the sexes the deaths in each year largely outnumber the births, and the increase in the population is accounted for solely by the number of immigrants, chiefly from the mainland of China, and to a

lesser extent from India also.

The revenue of Perak in 1874 amounted to $226,333. That for 1905 amounted to $12,242,897. Of this latter sum $4,876,400 was derived from duty on exported tin, $2,489,300 from railway receipts, $505,300 from land revenue and $142,800 from postal and telegraphic revenue. The remainder is mainly derived from the revenue farms, which are leased to Chinese capitalists for a short term of years, conveying to the lessee the right to collect import duties upon opium, wine and spirits, to keep pawnbroking shops, and to keep public licensed gambling-houses for the use of Chinese only. The expenditure for 1905 amounted to $10,141,980. Of this sum $4,236,000 was expended upon railway upkeep and construction and $2,176,100 upon public works. The value of the imports into Perak during 1905 was over $20,000,000, and that of the exports exceeded $40,000,000, making a total of over $60,000,000, equivalent to about seven million sterling. The output of tin from Perak ranged between 18,960 tons, valued at $23,099,506 in 1899, and 26,600 tons, valued at $35,500,000, in 1905. The fluctuating character of the output is due, not to any exhaustion of the mineral deposits of the state—that is not to be anticipated for many years yet to come—but to the uncertainty of the labour supply. The mining population is recruited exclusively from the districts of southern China, and during certain years an increased demand for labourers in China itself, in French Indo-China, in the Dutch colonies, and in South Africa temporarily and adversely affected immigration to the Straits of Malacca. The output has, moreover, been affected from time to time by the price of tin, which was $32.20 per pikul in 1896, rose to $42.96 in 1898, to $74.15 in 1900, and averaged $80.60 in 1905. Exclusive of tin, the principal exports were $108,000 worth of Para rubber, $181,000 of copra, $54,000 of hides, $48,000 of patchouli, and considerable quantities of timber, rattans and other jungle produce. The agricultural development of the state is still in its infancy, but rubber is cultivated in rapidly increasing areas, and the known fertility of the soil, the steady and regular rainfall, the excellent means of communication, and the natural and artificial conditions of the country, justify the expectation that the future of Perak as an agricultural country will be prosperous.

General.

Although so much has been done to develop the resources of Perak, by far the greater portion of the state is still covered by dense and virgin forest. In 1898 it was calculated that only 330,249 acres of land were occupied or cultivated out of a total acreage of 6,400,000. The area of agricultural holdings has notably increased, but a considerable period must yet elapse before it will amount to even one-tenth of the whole. A line of railway connects the port of Teluk Anson with the great mining district of Kinta, whence the line runs, crossing the Perak River at Enggor, to Kuala Kangsar, the residence of the sultan, thence to Taiping, the administrative capital of the state, and via Krian to a point opposite to the island of Penang. A second line runs south from Perak and connects with the railway system of Selangor, which in its turn connects with the Negri Sembilan and Malacca line, thus giving through railway communication between the last-named town and Penang. Perak also possesses some 600 miles of excellent metalled cart-road, and the length of completed road is annually increasing.

For administrative purposes the state is divided into six districts: Upper Perak, Kuala Kangsar and Lower Perak, on the Perak River; Kinta; Batany Padang and Larut and Krian. Of these, Larut and Kinta are the principal mining centres, while Krian is the most prosperous agricultural district. The districts on the Perak River are mostly peopled by Malays. The administrative capital is Taiping, the chief town of Larut. Kuala Kangsar is chiefly memorable as having been the scene of the first federal meeting of native chiefs, who, with the British Residents from each state, met together in 1897 for friendly discussion of their common interests for the first time in history, under the auspices of the high commissioner, Sir Charles H. B. Mitchell. This, in the eyes of those who are acquainted with the character of the Malays and of the relations which formerly subsisted between the rulers of the various states, is perhaps the most signal token of the changes which British influence has wrought in the peninsula.

SELANGOR is situated between the parallels 2° 32′ and 3° 37′ N. and 100° 38′ and 102° E., on the western side of the Malay Peninsula. It is bounded on the N. by the protected native state of Perak, on the S. by the protected states of the Negri Sembilan, on the E. by Pahang and the Negri Sembilan, and on the W. by the Straits of Malacca. The coast-line is about 100 m. in length, greatest length about 104 m., and greatest breadth about 48 m., total area estimated at about 3000 sq. m.

The state consists of a narrow strip of land between the mountain range which forms the backbone of the peninsula and the Straits of Malacca. Compared with other states in the peninsula, Selangor is poorly watered. The principal rivers are the Selangor, the Klang and the Langat. The principal port of the state is Port Swettenham, situated at the mouth of the Klang River, and is connected with the capital, Kuala Lumpor, by a railway. The geology of the state closely resembles that of Perak. The state is possessed of most valuable deposits of alluvial tin, and mining for this metal is the chief industry of the population. Kuala Lumpor is also the federal capital of the Malay States.

History.

According to native tradition, the ruling house of Selangor is descended from a Bugis raja, who, with two of his brothers, settled in the state in 1718, the son of the youngest brother eventually becoming ruler of the country. In 1783 the then sultan of Selangor joined with the Iang-di-per-Tuan Muda of Riau in an unsuccessful attack upon the Dutch who then held Malacca. In retaliation the Dutch, under Admiral Van Braam, invaded Selangor and drove the sultan out of his country. In 1785, aided by the Bendahara of Pahang, Sultan Ibrahim of Selangor reconquered his state; but the Dutch blockaded his ports, and eventually forced him to enter into a treaty whereby he consented to acknowledge their sovereignty. The earliest British political communication with Selangor began in 1818, when a commercial treaty was concluded with the governor of Penang. In 1867 Sultan Abdul Samad of Selangor appointed his son-in-law, Tungku Dia Udin, to be viceroy; and this gave rise to a civil war which lasted almost without intermission till 1873, when the enemies of Tungku Dia Udin were finally vanquished, largely by the agency of the Bendahara of Pahang, who, at the invitation of the governor of the Straits Settlements, sent a warlike expedition to the assistance of the viceroy. In 1874 the occurrence of an atrocious act of piracy off the mouth of the Langat River led to the governor, Sir Andrew Clarke, appointing, at the request of the sultan, a British Resident to aid him in the administration of his kingdom. Since that date there has been no further breach of the peace, and the prosperity of Selangor has increased annually.

By the census taken on the 5th of April 1891 the population of Selangor was given at 81,592 souls, of whom 67,051 were males and only 14,541 were females. The census taken on the 5th of April 1901 gave a total population of 168,789 souls, of whom 136,823 were males and 31,966 females. Of these 108,768 were Chinese, 33,997 were Malays, 16,748 were Tamils, and only 487 were Europeans. The returns deal with nearly

a score of different nationalities. Since 1901 the population has been much increased and now certainly exceeds 200,000 souls. Now, however, that instead of a single port of entry there exist easy means of access to the state by rail both from the north and the south, it is no longer possible to estimate the annual increase by immigration with any approach to accuracy. It will be noted that the inhabitants of this erstwhile Malayan state were, even at the time of the census of 1901, over 64% Chinese, while the Malays were little more than 20% of the population. In Selangor, as elsewhere in the Malay Peninsula, the deaths annually far outnumber the births recorded (*e.g.* in 1905 births 8293, deaths 12,500). The disproportion of the female to the male sections of the population is greater in Selangor than in any other part of the colony or Malay States. The development of planting enterprise in Selangor, and more especially the cultivation of rubber, has led during recent years to the immigration of a considerable number of Tamil coolies, but the Tamil population is still insignificant as compared with the Chinese.

Finance, Trade, &c.

The revenue of Selangor in 1875 amounted to only $115,656; in 1905 it had increased to $8,857,793. Of this latter sum $3,195,318 was derived from duty on tin exported, $1,972,628 from federal receipts, and $340,360 from land revenue. The balance is chiefly derived from the revenue farms, which include the right to collect import duty on opium and spirits. The expenditure for 1905 amounted to $7,186,146, of which sum $3,717,238 was on account of federal charges and $1,850,711 for public works. The value of the imports in 1905 was $24,643,619 and that of the exports was $26,683,316, making a total of $51,326,935, equivalent to £5,988,000. Tin is the principal export. The amount exported in 1905 was 17,254 tons. The total area of alienated mining land at the end of 1905 amounted to 65,573 acres, and it was estimated that over 60,000 Chinese were employed in the mines.

The main trunk line of the Federated Malay States railways passes through Selangor. It enters the state at Tanjong Malim on the Perak boundary, runs southward through Kuala Lumpor and so into the Negri Sembilan. It runs for 81 m. in Selangor territory. A branch line 27 m. long connects Kuala Lumpor with Port Swettenham on the Klang Straits where extensive wharves, capable of accommodating ocean-going vessels, have been constructed. A second branch line, measuring rather more than 4 m. in length, has been opened to traffic. It connects the caves at Batu with Kuala Lumpor. Frequent communication is maintained by steamer between Port Swettenham and Singapore, and by coasting vessels between the former port and those on the shores of the Straits of Malacca. All the principal places in the state are connected with one another by telegraph.

For administrative purposes Selangor is divided into six districts: Kuala Lumpor, in which the capital and the principal tin-fields are situated; Ulu Selangor, which is also a prosperous mining district; Kuala Selangor, which is agricultural, and poorly populated by Malays; Ulu Langat, mining and agricultural; Kuala Langat, the residence of the late sultan Abdul Samad, agricultural; and Klang, the only prosperous port of the state. Much money has been expended upon the capital, Kuala Lumpor, which possesses some fine public buildings, waterworks, &c., and where the principal residence of the Resident-General is situated. In some sort Kuala Lumpor is the capital not only of Selangor, but also of the whole federation. Its scenery is very attractive.

Negri Sembilan (the Nine States) is a federation of small native states which is now treated as a single entity, being under the control of a British Resident, and is situated between parallels 2° 28′ and 3° 18′ N. and 101° 45′ and 102° 45′ E., on the western side of the Malay Peninsula. It is bounded on the N. by the protected state of Pahang, on the S. by the territory of Malacca, on the E. by Pahang and the independent state of Johor, and on the W. by the Straits of Malacca. The coast-line is about 28 m. in length, and the extreme distance from north to south is 55 m., and that from east to west about 65 m. The estimated area is about 3000 sq. m. Port Dickson, or Arang-Arang, is the only port on the coast. It is connected with the capital, Seremban, by a railway 24 m. in length. Most of the states comprising the federation depend largely for their prosperity upon agriculture, but in some of the districts tin is being worked in considerable quantities, with good results.

History.

As is the case with the history of most Malayan states, much rests upon no surer ground than tradition, in so far as the records of the Negri Sembilan are concerned. At the same time the native story that the states which now form the federation of the Negri Sembilan were originally peopled by tribes of Sakai, or aborigines of the peninsula, who descended from the mountains of the interior and peopled the valleys, is supported by much corroborative evidence. Not only does the Malay's contempt for the Sakai make it exceedingly unlikely that the tradition, which is hardly a matter for pride, should have been preserved if it were not true, but also many of the laws and customs in force in these states are wholly foreign to those of the Malays, and can plainly be traced to the aborigines. As an instance, the custom of inheriting rank and property through the mother instead of through the father may be mentioned. Tradition further relates that towards the end of the 18th century a raja of the royal house of Menangkabu 481
came from Sumatra to rule over the federation of small states, each of which continued to be governed in all its local affairs by its own chief and by the village and other councils sanctioned by ancient custom. The Sumatran raja took the title of Iang-di-per-Tuan of Sri Menanti. Although they bore the name of the "Nine States," only six seem to have belonged to the federation during the time of which history speaks. These are Sri Menanti, Johol, Tampin, Rembau, Jelebu, and Sungei Ujong. Later the two latter separated themselves from the confederation. Ancient tradition says that the names of the nine states were originally Klang, Jelebu, Sungei Ujong, Johol, Segamat, Pasir Besar, Naning, Rembau and Jelai. Of these Klang was annexed by Selangor, Segamat and Pasir Besar by Johor, and Naning by Malacca. During the last years of the 18th century the Iang-di-per-Tuan appointed an Iang-di-per-Tuan Muda to rule Rembau, and the state of Tampin was created to provide for the family of the new chief. In 1887 the governor of the Straits Settlements sent Mr Martin Lister to the Negri Sembilan, which had become disintegrated, and by his influence the ancient federal system was revived under the control of a Resident appointed by the governor. The states which formed this new confederation were Johol, Ulu Muar, Jempol, Terachi, Inas, Gunong Pasir, Rembau, Tampin and Gemencheh. Prior to this, in 1873, owing to a civil war in Sungei Ujong, Sir Andrew Clarke sent a military force to that state, put an end to the disturbances, and placed the country under the control of a British Resident. Jelebu was taken under British protection in 1886, and was thenceforth managed by a magistrate under the orders of the Resident of Sungei Ujong. In 1896, when the federation of all the Malayan states under British control was effected, Sungei Ujong and Jelebu were reunited to the confederation of small states from which they had so long been separated and the whole, under the old name of the Negri Sembilan, or Nine States, was placed under one Resident.

The population of the Negri Sembilan, which according to the census taken in April 1891 was only 70,730, had increased to 96,028 by 1901, and was estimated at 119,454 in 1905. Of these 46,500 are Chinese, 65,000 Malays, 6700 Tamils, and 900 Europeans and Eurasians. The births registered slightly exceed the deaths in

number, there being a large Malay population in the Negri Sembilan among whom the proportion of women to men is fair, a condition of things not found in localities where the inhabitants are mostly Chinese immigrants.

Finance and Trade.

The revenue of the Negri Sembilan amounted to only $223,435 in 1888. In 1898 it had increased to $701,334, in 1900 to $1,251,366, and in 1905 to $2,335,534. The revenue for 1905 was derived mainly as follows:—customs $1,268,602, land revenue $145,475, land sales $21,407, while the revenue farms contributed $584,459. The expenditure in 1905 amounted to $2,214,093, of which $1,125,355 was expended upon public works. The trade returns for 1905, which are not, however, complete, show an aggregate value of about $13,000,000. The value of the tin exported during 1905 exceeded $6,900,000, and the value of the agricultural produce, of which gambier represented $211,000 and damar $80,000, amounted to $407,990.

General.

Seremban, the administrative capital of the Negri Sembilan, is connected with Port Dickson by a railway line, owned by the Sungei Ujong Railway Company, which is 24½ m. in length. It is also situated on the trunk line of the Federated Malay States, and is thus joined by rail to Selangor on the north and to Malacca on the south. Frequent steam communication is maintained between Port Dickson and the ports on the Straits of Malacca and with Singapore.

For administrative purposes the Negri Sembilan is divided into five districts, viz. the Seremban District, the Coast District, Jelebu, Kuala Pilah and Tampin. Each of these is under the charge of a European district officer, who is responsible to the Resident. The Iang-di-per-Tuan lives at Kuala Pilah, but the capital of the federation is at Seremban in Sungei Ujong, where the Resident is stationed. The hereditary chiefs of the various states aid in the government of their districts, and have seats upon the state council, over which the Iang-di-per-Tuan presides. The watering-place of Magnolia Bay, where excellent sea-bathing is obtainable, is one of the pleasure resorts of this part of the peninsula.

PAHANG, on the east coast of the peninsula, is situated between parallels 2° 28′ and 3° 45′ N. and 101° 30′ and 103° 30′ E. It is bounded on the N. by the independent native states of Kelantan and Trengganu; on the S. by the Negri Sembilan and Johor; on the E. by the China Sea; and on the W. by the protected states of Perak and Selangor. The coast-line is about 112 m. in length; the greatest length is about 210 m., and greatest breadth about 130 m. The state is the largest in the peninsula, its area being estimated at 15,000 sq. m. The ports on the coast are the mouths of the Endau, Rompin, Pahang and Kuantan rivers, but during the north-east monsoon the coast is not easy of approach, and the rivers, all of which are guarded by difficult bars, are impossible of access except at high tides.

The principal river of the state is the Pahang, from which it takes its name. At a distance of 180 m. from the coast this river is formed by two others named respectively the Jelai and the Tembeling. The former is joined 20 m. farther up stream by the Lipis, which has its rise in the mountains which form the boundary with Perak. The Jelai itself has its rise also in a more northerly portion of this range, while its two principal tributaries above the mouth of the Lipis, the Telom and the Serau, rise, the one in the plateau which divides Perak from Pahang, the other in the hills which separate Pahang from Kelantan. The Tembeling has its rise in the hills which divide Pahang from Kelantan, but some of its tributaries rise on the Trengganu frontier, while the largest of its confluents comes from the hills in which the Kuantan River takes its rise. The Pahang is navigable for large boats as far as Kuala Lipis, 200 m. from the mouth, and light-draught launches can also get up to that point. Smaller boats can be taken some 80 m. higher up the Jelai and Telom. The river, however, as a waterway is of little use, since it is uniformly shallow. The Rompin and Kuantan rivers are somewhat more easily navigated for the first 30 m. of their course, but taken as a whole the waterways of Pahang are of little value. The interior of Pahang is chiefly noted for its auriferous deposits. Gunong Tahan is situated on the boundary between Pahang and Kelantan. Its height is estimated at 8000 ft. above sea-level, but it has never yet been ascended. Pahang, like the states on the west coast, is covered almost entirely by one vast forest, but in the Lipis valley, which formerly was thickly populated, there is a considerable expanse of open grass plain unlike anything to be seen on the western seaboard. The coast is for the most part a sandy beach fringed with *casuarina* trees and there are only a few patches of mangrove-swamp throughout its entire length.

History.

The ancient name of Pahang was Indrapura. It is mentioned in the history of *Hang Tuah*, the great Malacca brave, who flourished in the 16th century, and succeeded in abducting a daughter of the then ruling house of Pahang for his master, the sultan of Malacca. Prior to this, Pahang had been ruled by the Siamese. When Malacca fell into the hands of the Portuguese in 1511 the sultan, Muhammad Shah, fled to Pahang, and the present ruling house claims to have been descended from him. The title of the ruler of Pahang was Bendahara until 1882, when the present (1902) ruler, Wan Ahmad, assumed the title of sultan, taking the name of Sultan Ahmad Maatham Shah. Up to that time the Bendahara had been installed on his accession by the sultan of Riau, and held his office by virtue of that chief's letter of authority. About 1855 the father of the present sultan died at Pekan, and his son Bendahara Korish, who succeeded him, drove Wan Ahmad from the country. After making three unsuccessful attempts to conquer the land and to dethrone his elder brother, Wan Ahmad at last succeeded in 1865 in invading the state and wresting the throne from his nephew, who had succeeded his father some years earlier. From that time, in spite of two attempts to shake his power by invasions from Selangor which were undertaken by his nephews Wan Aman and Wan Da, Bendahara Ahmad ruled his country with a rod of iron. In 1887 he consented to enter into a treaty with the governor of the Straits by which he accepted a consular agent at his court. This treaty was finally signed on the 8th of October 1887. In February of the following year a Chinese British subject was murdered at Pekan in circumstances which pointed to the responsibility of the sultan for the crime, and in October 1888 a Resident was appointed to assist the sultan in the administration of his country, that being, in the opinion of the British government, the only guarantee for the safety of the life and property of British subjects which it could accept. In December 1891 disturbances broke out in Pahang, the nominal leaders of which were certain of the sultan's most trusted chiefs. The sultan himself took no part in the outbreak, but it undoubtedly had his sympathy, even if it was not caused by his direct commands. The rebels were driven to seek safety in flight in November 1892, but in June 1894 they gathered strength for a second disturbance, and raided Pahang from Kelantan, in which state they had been given shelter by the Mahommedan rulers. This event, added to the occurrence of other raids from across the border, led to an irregular expedition being led into Trengganu and Kelantan by the Resident of Pahang (Mr Hugh Clifford) in 1895, and this had the desired result. The rebel chiefs were banished to Siam, and no further breach of the peace has troubled the tranquillity of Pahang since that time. Pahang joined the Federated Malay States by a treaty signed in 1895, and the sultan and his principal chiefs were present at the federal durbar held at Kuala Kangsar in Perak in

1897.

The census taken in April 1901 gave the total population of Pahang at 84,113, of whom 73,462 were Malays, 8695 Chinese, 1227 Tamils and other natives of India, 180 Europeans and Eurasians, and 549 people of other nationalities. The population in 1905 was estimated at 100,000, the increase being due to immigration mainly from the states on the western seaboard. In former days Pahang was far more thickly populated than in modern times, but the long succession of civil wars which racked the land after the death of Bendahara Ali caused thousands of Pahang Malays to fly the country. To-day the valley of the Lebir River in Kelantan and the upper portions of several rivers near the Perak and Selangor boundaries are inhabited by Pahang Malays, the descendants of these fugitives. The Pahang natives are almost all engaged in agriculture. The work of the mines, &c., is performed by Chinese and foreign Malays. In the Lipis valley the descendants of the Rawa Malays, who at one time possessed the whole of the interior in defiance of the Pahang rajas, still outnumber the people of the land.

Population.

The revenue of Pahang in 1899 amounted to only $62,077; in 1900 to $419,150. In 1905 it was $528,368. The expenditure in 1905 amounted to $1,208,176. Of this sum $736,886 was expended on public works. Pahang is still a source of expense to the federation, its progress having been retarded by the disturbances which lasted from December 1891 until 1895, with short intervals of peace, but the revenue is now steadily increasing, and the ultimate financial success of the state is considered to be secure. Pahang owes something over $3,966,500 to Selangor and $1,175,000 to Perak, which have financed it now for some years out of surplus revenue. The value of the imports in 1905 was $1,344,346, that of the exports was $3,838,928, thus making a total trade value of $5,183,274. The most valuable export is tin, the value of which in 1905 amounted to $2,820,745. The value of the gutta exported exceeded $140,000, that of dried and salted fish amounted to nearly $70,000, and that of timber to $325,000.

Finance and Trade.

The geological formation of the states lying to the eastward of the main range of mountains which splits the peninsula in twain differs materially from that of the western states. At a distance of about a dozen miles from the summits of the mountains the granite formation is replaced by slates, which in many places are intersected by fissures of quartz, and in others are overlaid by vast thicknesses of limestone. Those of the quartz fissures which have been exploited are found to be auriferous, and several mining companies have attempted to work the deposits. Their efforts, however, have not hitherto been successful. A magnificent road over the mountains, with a ruling grade of 1 in 30, joins Kuala Lipis, the administrative capital of Pahang, to Kuala Kubu, the nearest railway station in Selangor. The road measures 82 m. in length. Pekan, where the sultan has his residence, was the capital of Pahang until the middle of 1898, when the administrative headquarters were transferred to the interior as being more central. None of these towns is of any size or importance. In the Kuantan valley, which lies parallel to the Pahang River, a European company is working tin lodes with considerable success. These lodes are the only mines of the kind being worked in the Federated Malay States. Pahang is fertile and well suited for agriculture of many kinds. The rainfall is heavy and regular. The climate is cooler than that of the west coast, and the full force of the monsoon is felt from October to February in each year. For administrative purposes Pahang is divided into four districts—Ulu Pahang, in which the present capital is situated; Temerloh, which includes 80 odd miles of the Pahang valley and the Semantan River; Pekan, which includes the coast rivers down to Endau; and Kuantan. Each of these is under the charge of a district officer, who is responsible to the resident. The boundary with Johor and the Negri Sembilan was rectified by a commission which sat in London in 1897-1898.

General.

Authorities.—*Journal of the Eastern Archipelago* (Singapore); *Journal of the Straits Branch of the Royal Asiatic Society* (Singapore); Maxwell, *Proceedings of the Royal Colonial Institute*, vol. xxiii.; Swettenham, ibid. vol. xxvii; Clifford, ibid. vol. xxx. (London, 1892, 1895, 1899); Swettenham, *About Perak* (Singapore, 1893); *Malay Sketches* (London, 1895); *The Real Malay* (London, 1899); *British Malaya* (London, 1906); Clifford, *In Court and Kampong* (London, 1897); *Studies in Brown Humanity* (London, 1898); *In a Corner of Asia* (London, 1899); *Bush-whacking* (London, 1901); *Further India* (London, 1904); De la Croix, *Les Mines d'etins de Perak* (Paris, 1882); Bluebook, C. 9524 (London, 1899); *The Straits Directory* (Singapore, 1906); Skeat, *Malay Magic* (London, 1900); Skeat and Blagden, *Pagan Races of the Malay Peninsula* (London, 1906).

(H. Cl.)

II.—Non-Federated States

In 1909 a treaty was made between Great Britain and Siam, one provision of which was the cession to the former of the suzerain rights enjoyed by the latter over certain territories in the Malay Peninsula. These territories consisted of the four Siamese Malay States: Kelantan, Trengganu, Kedah and Perlis, very ancient dependencies of Siam, all of which except Trengganu, were in a flourishing condition and had been administered by British officers in the service of Siam for some years prior to their transference. Though the four states were loyal to Siam and wished to retain their former allegiance, the change was effected without disturbance of any kind, the British government on assuming the rights of suzerainty placing an adviser at the court of each raja and guaranteeing the continuance of the administration on the lines already laid down by Siam so far as might be compatible with justice and fair treatment for all. The four states lie to the north of the Federated Malay States, two on the east and two on the west side of the peninsula.

Kelantan.—This state on the east coast, bounded N. and N.E. by the China Sea, E. by Trengganu, S. by Pahang and W. by Perak and Ra-ngé, lies between 4° 48′ and 6° 20′ N. and 101° 33′ and 102° 45′ E. The greatest length from north to south is 115 m. and the greatest breadth from east to west 60 m. The area is about 5000 sq. m. The northern part of the state is flat and fertile, but the southern district which comprises more than half the total area, is mountainous and uncultivated.

Next to the Pahang, the Kelantan River is the largest on the east coast. It is 120 miles long and is navigable for shallow-draft launches and big country boats for about 80 miles, and for vessels of 8 ft. draft for about six miles. Its principal tributaries are the Galas, Pergau and Lebir. The Golok and Semarak rivers water the west and east parts of the state, falling into the sea a few miles on either side of the mouth of the Kelantan River. The climate of Kelantan is mild and singularly healthy in the open cultivated regions. The population is about 300,000 of which 10,000 are aboriginal tribes (Sakeis and Jakuns), 10,000 Siamese and Chinese and the rest Malays. The Chinese are increasing and natives of different parts of India are resorting to the state for

purposes of trade. Kota Bharu (pop. 10,000) is the only town in the state. It lies on the right bank of the river, about six miles from the sea. Since 1904 it has been laid out with metalled roads and many public and private buildings have been erected. The town is the commercial as well as the administrative centre of the state. Tumpat and Tabar on the coast, with population 4000 and 3000 respectively, are the places next in importance after Kota Bharu. A network of creeks render communication easy in the northern districts, the river and its tributaries afford means of access to all parts of the south; 20 miles of road have been made in the neighbourhood of Kota Bharu. Kelantan is connected by telegraph with Bangkok and Singapore, and maintains regular postal communication with those places. Rice cultivation is the principal industry and is increasing rapidly. Coco-nut and betel-nut growing are also largely practised. Much livestock is raised. About 400,000 acres of land are under cultivation. Though reputed rich in minerals, past misrule prevented mining enterprise in Kelantan until, in 1900, a large concession was given to an Englishman and the country was opened to foreigners. In 1909 three mining syndicates were at work, and several others were in process of formation. Gold, tin and galena have been found in several localities and during the years 1906-1909 28,000 ounces of gold were dredged from the Kelantan River. The Kelantanese are expert fishermen, some 30,000 finding employment in fishing and fish-drying. Silk-weaving is a growing industry. Foreign trade, which in 1909 reached the value of two and a half million dollars, is chiefly with Singapore. Principal exports are copra, rice, fish, cattle and gold; chief imports are cotton goods, hardware and specie. The currency is the Straits Settlements dollar and small silver coin, supplemented by a locally made tin coin of low value.

By virtue of a mutual agreement made in 1902 Siam appointed a resident commissioner to Kelantan and consented, so long as the advice of that officer should be followed, to leave internal affairs to be conducted locally. Under this arrangement a council of state was appointed, departments of government were organized, penal, civil and revenue laws were passed and enforced, courts were established and a police force was raised. Though formerly of an evil reputation, the people were found to be naturally peaceful and law-abiding, and serious crime is rare. The state revenue, which was practically nothing in 1902, amounted to $320,000 in 1907. Islamism was adopted about 300 years ago but the old animistic superstitions are still strong. The state is divided into *mukim* or parishes, but the *imam* no longer exercise temporal authority. There are three schools at Kota Bharu, education in the interior being in the hands of the imam assisted with government grants.

No historical records of Kelantan exist, and the state was not noticed by the European merchants of the 16th and 17th centuries. Consequently little is known of its early history beyond what is to be gathered from brief references in the Malay annals and the old chronicles of Siam. The sites of ancient towns and the remains of former gold diggings are visible here and there, but all knowledge of the men who made these marks has been lost. The present ruling family dates from about 1790. Siam was frequently called upon to maintain internal peace and in 1892 a royal prince was sent to reside in Kelantan as commissioner. Complications brought about by the incapacity of the ruler led to the making of the agreement of 1902 above mentioned, to the fixing of a regular tribute in money to Siam, and ultimately to the merging of the state from chaotic lawlessness into the path of reform. On the 15th of July 1909 the state came under British suzerainty and the commissioner of Siam was replaced by a British adviser, from which date the liability to payment of tribute ceased, though in all other respects the administrative arrangements of Siam remained unaltered.

Trengganu.—This state on the east coast, bounded N. and N.E. by the China Sea, S. by Pahang and W. by Pahang and Kelantan, lies between parallels 4° 4′ and 4° 46′ N. and 102° 30′ and 103° 26′ E. The greatest length from north to south is 120 m., and the greatest breadth from east to west 50 m. It has a coast-line of 130 m. and an estimated area of about 5000 sq. m. There are several islands off the coast, some of which are inhabited. The surface is generally mountainous.

Principal rivers are the Besut, Stiu, Trengganu, Dungun and Kmamun, none of which is navigable for any distance. The climate is mild and fairly healthy. The population numbers about 180,000, almost all Malays, and mostly clusters round the mouths and lower reaches of the rivers. The capital, which is situated at the mouth of the Trengganu River, contains, with its suburbs, not less than 30,000 people. Difficulty of access by river and by land render the interior districts almost uninhabitable. Communication is maintained by boat along the coast. There are no roads and no postal or telegraphic communications.

The majority of the people are sailors and fishermen. Rice is grown, but not in sufficient quantities to supply local needs. Much pepper and gambier were at one time grown and exported, but about the year 1903 agriculture began to fall off owing to prevailing insecurity of life and property. Not much livestock is raised, the few head of cattle exported from Besut being mostly stolen from across the neighbouring Kelantan border. A successful tin mine under European control exists in the Kmamun district, but as everything possible was done in the past to discourage all foreign enterprise, the probable mineral wealth of the country is still practically untouched. Silk-weaving, carried on entirely by the women, is a considerable industry. The silk is imported raw and is re-exported in the form of Malay clothing (*sarongs*) of patterns and quality which are widely celebrated. The manufacture of native weapons and of brassware was at one time brisk but is declining. The trade of Trengganu is not increasing. It is valued roughly at about one and a half million dollars a year, is chiefly with Singapore, and is to a great extent carried in Trengganu-built ships, which latter also do some carrying trade for other states on the east coast.

The Trengganu sultanate is one of the most ancient in the peninsula and ranks with that of Riau. The state was feudatory to Malacca in the 13th century and during the 14th, 15th and 16th centuries its possession was frequently disputed between Malacca and Siam. The present sultan is the descendant of an ancient family, the members of which have quarrelled and fought with each other for the succession from time immemorial. The last serious disturbance was in 1837 when the grandfather of the present sultan stole the throne from his nephew. Until the acquisition of the state by Great Britain a triennial tribute of gold flowers was paid to Siam, and this with occasional letters of instructions and advice, constituted almost the only tangible evidence of Siamese suzerainty. Of government there was practically none. The sultan, having alienated most of his powers and prerogatives to his relatives, passed his life in religious seclusion and was ruler in no more than name. The revenues were devoured by the relatives, a small part of those accruing from the capital sufficing for the sultan’s needs. There were no written laws, no courts and no police. All manner of crime was rampant, the peasantry was mercilessly downtrodden, but the land was full of holy men and the cries of the miserable were drowned in the noise of ostentatious prayer. In fine, Trengganu presented in the beginning of the year 1909 the type of untrammelled Malay rule which had fortunately disappeared from every other state in the peninsula. In July of that year, however, the first British adviser or agent arrived in the state, which was shortly afterwards visited by the governor of the Straits Settlements, who discussed with the sultan the

changed conditions consequent upon the Anglo-Siamese treaty and laid the foundations of future reform.

KEDAH.—This state, on the west coast of the peninsula, lies between parallels 5° 20′ and 6° 42′ N., and is bounded, N. by Palit and Songkla, E. by Songkla and Raman, S. by Province Wellesley and Perak, and W. by the sea. The coast-line is 65 m. long, the greatest distance from north to south is 115 m. and the greatest breadth 46 m. Off the coast lies a group of islands, the largest of which is Langkawi, well peopled and forming a district of the state.

The total area of Kedah is about 4000 sq. m. The land is low-lying and swampy near the coast except towards the south where the height known as Kedah Hill rises from the shore opposite Penang, flat and fertile farther inland, and mountainous towards the eastern border. The rivers are small, the Sungei Kedah, navigable for a few miles for vessels of 50 tons, and the S. Muda, which forms the boundary with Province Wellesley, being the only streams worthy of notice. The plains are formed of marine deposit, and in the mountains limestone and granite preponderate. The population is estimated at 220,000, of whom about 100,000 are Malays, 50,000 Siamese and Samsams and 70,000 Chinese and Madrassis (Klings). There are three towns of importance. Alor Star, the capital, on the Kedah river, 10 miles from the sea, in a flat, unhealthy, but fertile locality, is a well laid out town with good streets, many handsome public and private buildings, and good wharfage for small vessels. The population is about 20,000, of whom more than half are Chinese and the remainder government servants and retainers of the local aristocracy. Kuala Muda (pop. 10,000) and Kulim (pop. 8000) situated in the south, are unimposing collections of small birch houses and thatched bamboo huts; the latter is the centre of the Kedah tin mining industry. The bulk of the population is scattered over the plains in small villages. A good road runs north from Alor Star to the border of the state, a distance of 40 miles, and other roads are being constructed. The state has 185 miles of telegraph line and 75 miles of telephone line. Mails are closed daily at Alor Star for Penang and there is a good internal postal service. The chief industry is rice cultivation. Coco-nut, betel-nut and fruit plantations are many, and the cultivation of rubber has recently been taken up with prospects of success. The estimated area under cultivation is about 300,000 acres. There are rice-mills at Alor Star and at Kuala Muda. The principal exports are rice, cattle and tin. The chief imports are cotton goods, provisions, hardware and raw silk. Accurate trade statistics are not available. The ruler holds the rank of sultan and is assisted in the government by a council and by the British adviser who since the state passed from Siamese to British protection in 1909, has replaced the officer formerly appointed by Siam. The sultan comes of a family long recognized by Siam as having hereditary right to the rulership. The penal and civil laws are administered in accordance with the precepts of Islamism, the official religion of the state. Though much has been done to improve the courts, justice is not easily obtainable. A land registration system is in force but is in a state of confusion, though a land law passed in 1905 gives security of tenure over lands newly acquired. The mining laws are similar to those of Siam. In 1905 the Siamese government advanced two and a half million dollars to Kedah, to pay the debts of the state, which sum was refunded by the British Government on assuming the position of protector. The annual revenue is $1,000,000 and the expenditure about the same. Chief heads of revenue are opium and land tax. Many revenue monopolies, created in the past, have not yet expired; but for this the revenue would be greater than it is. There is no army. In 1906 the police service was reorganized under British officers, resulting in great improvement to this department. The state is divided into a number of administrative districts under Malay officials. Each district comprises several *mukim* or parishes, the *imam* of which exercise both spiritual and temporal control. There are schools in the chief towns, but education has not yet been seriously undertaken.

Kedah was founded by colonists from India in A.D. 1200, about which time the Siamese had subdued Nakhon Sri Tammarat and claimed the whole Malay Peninsula. When the rise of Malacca shook Siamese authority in the peninsula, Kedah oscillated between them, and on the conquest of Malacca by the Portuguese, fell to Siam, though the capital was raided and burnt by the Europeans. The ruler and his people were converted to Islam in the 15th century. In 1768, the Siamese kingdom being disorganized, the sultan of Kedah entered into direct political relations with the Hon. East India Company, leasing the island of Penang to the latter. Further treaties followed in 1791 and 1802, but in 1821 Siam reasserted her control, expelling the rebellious sultan after a sanguinary war. The sultan made several fruitless efforts to recover the state, and at length made full submission, when he was reinstated. In 1868 an agreement between Great Britain and Siam was substituted for the treaties of the East India Company with the sultan. The present sultan succeeded in 1881, and for 14 years governed well, but in 1895 he began to contract debts and to leave the government to his minions. The result was chaos, and in 1905 the Siamese government had to intervene to avert a condition of bankruptcy, adjusting the finances and reorganizing the general administration to such effect that when, four years later, the state became a British dependency, a government was found established on a sound basis and requiring nothing but the presence of a firm and experienced officer as adviser to maintain its efficiency and assist its further advance.

PERLIS (*Palit*).—This small state, consisting of the left bank drainage area of the Perlis River, lies between Setul and Kedah, which bound it on the N. and W. and on the E. respectively. It touches the sea only round the mouth of the river.

The population is about 10,000, Malays and Chinese. The chief town, Perlis, is situated about 12 m. up the river. A good deal of tin is worked, and rice and pepper are grown and exported. In the early part of the 19th century Perlis was a district of Kedah, but during a period of disturbance in the latter state it established itself as a separate chiefdom. In 1897 Siam restored the nominal authority of Kedah, but the measure was not productive of good. In 1905 the Siamese government advanced a loan of $200,000 to Perlis, and appointed an English adviser to assist in the general administration. This money was refunded to Siam and the adviser relieved by a British officer when the state became British in July 1909. The condition of the state has improved, but the revenue, $80,000, is not sufficient for the immediate needs of government.

Authorities.—Norman, *The Far East* (London, 1895); H. Clifford, in the *Geographical Journal* (London, 1896); Carter, *The Kingdom of Siam* (London, 1904); Graham, *Reports on Kelantan* (Bangkok, 1905-1909); Skeat and Blagden, *Pagan Races of the Malay Peninsula* (London, 1906); Hart, *Reports on Kedah* (Calcutta, 1907-1909); Graham, *Kelantan, a Handbook* (Glasgow, 1907).

(W. A. G.)

MALAY STATES (Siamese). The authority of Siam, which at one time covered the whole of the Malay peninsula, now extends southward to an irregular line drawn across the Peninsula at about 6° 30′ N. Between that line and the Isthmus of Kra, usually accepted as the northernmost point of the Malay Peninsula, there lie some 20,000 sq. m. of territory inhabited by a mixed population of Siamese and Malays with here and there a few remnants of the aboriginal inhabitants clinging to the wilder districts, and with a few Chinese settlers engaged in commerce. Formerly this tract was divided into a number of states, each of which was ruled by a chief (Siamese, *Chao Muang*; Malay, *raja*), who held his title from the king of Siam, but, subject to a few restrictions, conducted the affairs of his state in accordance with his own desires; the office of chief, moreover, was hereditary, subject always to the approval of the suzerain. The states formed two groups: a northern, including Langsuan, Chaya, Nakhon Sri Tammarat, Songkla, Renawng, Takoapa, Pang Nga, Tongka and Trang, in which the Siamese element predominated and of which the chiefs were usually Siamese or Chinese; and a southern, including Palean, Satun (Setul), Patani, Raman, Jering, Sai (Teloban), Re Nge (Legeh), Yala (Jalor) and Nong Chik, in which the population was principally Malay and the ruler also Malay. Four other states of the southern group, Kelantan, Trengganu, Kedah and Perlis, of which the population is entirely Malay, passed from Siamese to British protection in 1909.

With the gradual consolidation of the Siamese kingdom all the states of the northern group have been incorporated as ordinary provinces of Siam (*q.v.*), the hereditary *Chao Muang* having died or been pensioned and replaced by officials of the Siamese Civil Service, while the states themselves now constitute provinces of the administrative divisions of Chumpon, Nakhon Sri Tammarat and Puket. The states of the southern group, however, retain their hereditary rulers, each of whom presides over a council and governs with the aid of a Siamese assistant commissioner and with a staff of Siamese district officials, subject to the general control of high commissioners under whom the states are grouped. This southern group, with a total area of about 7000 sq. m. and a population of 375,000, constitutes the Siamese Malay States. A British consul with headquarters at Puket, and a vice-consul who resides at Songkla, watch over the interests of British subjects in the states of the west and east sides of the peninsula respectively. Other foreign powers are unrepresented.

Palean.—This small state on the west coast, bounded N. by the province of Trang, E. by the Songkla division, S. by the state of Setul, and W. by the sea, is about 900 sq. m. in area, and has a population of about 20,000. It is attached for administrative purposes to the province of Trang, and its people are chiefly engaged in the cultivation of pepper, of which about 150 tons are annually exported. A few tin mines are also worked.

Satun (*Setul*).—This small state, bounded N. by Palean, E. by Songkla, S. by Perlis, and W. by the sea, contains about 1000 sq. m. area with a population of about 25,000, Malays, Siamese and a few Chinese. The principal production is pepper, which is exported in junks and in the small Penang steamers which ply on the west coast of the peninsula. In 1897 Setul was placed under the control of Kedah, then a Siamese dependency, but the arrangement was not a success, and in 1907 the Siamese government was forced, owing to prevailing corruption and misrule, to restrict the powers of the chief and, cancelling the authority of Kedah, to place him to some extent under the orders of the high commissioner of Songkla. By the terms of the Anglo-Siamese treaty of 1909 about half of the state of Perlis was added to Satun, an arrangement by which the importance of the latter was considerably increased.

Patani.—The seven Malay states of Nawng Chik, Patani, Jering, Yala (Jalor), Sai (Teloban), Raman and Ra-ngé (Legeh) were constituted from the old state of Patani at the beginning of the 19th century. In 1906 they were reunited to form the Patani administrative division of Siam, but each state retains its Malay ruler, who governs jointly with a Siamese officer under the direction of the Siamese high commissioner, and many of the ancient privileges and customs of Malay government are preserved. The group of States is situated between 5° 34′ and 6° 52′ N. and 100° 54′ and 101° 58′ E. It is bounded N. by the China Sea, E. by the China Sea and Kelantan, S. by Perak, and W. by Kedah. The total area is about 5000 sq. m. The country is mountainous except close to the coast. The principal rivers are the Patani and the Teloban, long, winding and shallow, and navigable for small boats only. The population is about 335,000, of whom the great majority are Malays. Each state has its capital, but Patani (the headquarters of the high commissioner) is the only town of importance. Communications are poor and are chiefly by river, but roads are under construction. Patani and Sai are in telegraphic communication with Bangkok and Singapore, and regular weekly mails are despatched to those places. The area under cultivation is small except round about Patani and in Nawng Chik, where much rice is grown. Tin mining is a growing industry; many Chinese own mines and several European syndicates are at work in Raman, Ra-ngé and Patani, prospecting for, or mining, this metal. Fishing and salt-evaporation occupy a large proportion of the population. The annual export of tin is about 400 tons, and dried fish, salt, cattle and elephants are other exports. Steamers up to 300 tons maintain frequent communication with Bangkok and Singapore, and the Patani roads afford good anchorage at all seasons.

Mahommedan law is followed in the settlement of inherited property disputes and of matrimonial affairs; otherwise the laws of Siam obtain. Efficient law courts have been established in each state, and there is a serviceable force of gendarmerie recruited from amongst Malays and Siamese alike. The revenue amounts to about 600,000 ticals, or £45,000 a year, one-third being payable to the rulers as private income for themselves and their relatives, one-third expended on the administration, and one-third reserved for special purposes, but it is usually found necessary to devote the last-mentioned third to the expenses of administration. Patani has been subject to Siam from the remotest times. It is said that the old state adopted Islamism in the 16th century, the chief, a relative of the kings of Siam, embracing that religion and at the same time revolting to Malacca. It has several times been necessary to send punitive expeditions to recall the state to its allegiance. The present rulers are mostly descended from the ruling families of the neighbouring state of Kelantan, but the chief of Patani itself is a member of the family which ruled there in the days of its greatness. Throughout the 17th century Patani was resorted to by Portuguese, Dutch and English merchants, who had factories ashore and used the place as an emporium for trade with Siam. In 1621 an engagement took place in the Patani roads between three Dutch and two British ships, the latter being taken after the president of the British merchants, John Jourdain, had been killed. In 1899 the border between the state of Perak and Raman was fixed by an agreement between England and Siam, a dispute of old standing being thereby settled, but the question was reopened in the negotiations which preceded the Anglo-Siamese treaty of 1909, when a new

border line was fixed between British and Siamese possessions in the Peninsula.

(W. A. G.)

MALCHIN, a town of Germany, in the grand-duchy of Mecklenburg-Schwerin, on the river Peene, between lakes Malchin and Kummerow, 28 m. by rail N.W. of Neu-Brandenburg. Pop. (1900), 7449. It is, alternately with Sternberg, the place of assembly of the Diet of Mecklenburg. Here are the châteaux of Remplin, Basedow and Schlitz; a church dating from the 14th century, and a fine town-hall. The well-wooded and undulating country, environing the shores of Lake Malchin, is known as the "Mecklenburg Switzerland," and is increasing in favour as a summer resort. A canal unites Lake Kummerow with the Peene. The industries of the town include the manufacture of sugar and bricks, and brewing and malting. Malchin became a town in 1236.

MALCOLM, the name of four kings of the Scots, two of whom, MALCOLM I., king from 943 to 954, and MALCOLM II., king from 1005 to 1034, are shadowy and unimportant personages.

MALCOLM III. (d. 1093), called Canmore or the "large-headed," was a son of King Duncan I., and became king after the defeat of the usurper Macbeth in July 1054, being crowned at Scone in April 1057. Having married as his second wife, (St) Margaret (*q.v.*), a sister of Edgar Ætheling, who was a fugitive at his court, he invaded England in 1070 to support the claim of Edgar to the English throne, returning to Scotland with many captives after harrying Northumbria. William the Conqueror answered this attack by marching into Scotland in 1072, whereupon Malcolm made peace with the English king at Abernethy and "was his man." However, in spite of this promise he ravaged the north of England again and again, until in 1091 William Rufus invaded Scotland and received his submission. Then in 1092 a fresh dispute arose between the two kings, and William summoned Malcolm to his court at Gloucester. The Scot obeyed, and calling at Durham on his southward journey was present at the foundation of Durham Cathedral. When he reached Gloucester Rufus refused to receive him unless he did homage for his kingdom; he declined and returned home in high dudgeon. Almost at once he invaded Northumbria, and was killed at a place afterwards called Malcolm's Cross, near Alnwick, on the 13th of November 1093. Four of Malcolm's sons, Duncan II., Edgar, Alexander I., and David I., became kings of Scotland; and one of his daughters, Matilda, became the wife of Henry I. of England, a marriage which united the Saxon and the Norman royal houses.

MALCOLM IV. (*c.* 1141-1165) was the eldest son of Henry, earl of Huntingdon (d. 1152), son of King David I., and succeeded his grandfather David as king of Scotland in 1153. He is called the "Maiden," and died unmarried on the 9th of December 1165.

See E. A. Freeman, *The Norman Conquest*, vols. iv. and v. (1867-1879), and *The Reign of William Rufus* (1882); W. F. Skene, *Celtic Scotland* (1876-1880); E. W. Robertson, *Scotland under her Early Kings* (1862); and A. Lang, *History of Scotland*, vol. i. (1900).

MALCOLM, SIR JOHN (1769-1833), Anglo-Indian soldier, diplomatist, administrator and author, was born at Burnfoot on the Esk, near Langholm, Dumfriesshire, Scotland, on the 2nd of May 1769. His father was a humble farmer, but three of his sons attained the honour of knighthood. At the age of twelve he received a cadetship in the Indian army, and in April 1783 he landed at Madras, shortly afterwards joining his regiment at Vellore. In 1792, having for some time devoted himself to the study of Persian, he was appointed to the staff of Lord Cornwallis as Persian interpreter, but two years afterwards was compelled by ill health to leave for England. On his return to India in 1796 he became military secretary to Sir Alured Clarke, commander-in-chief at Madras, and afterwards to his successor General Harris; and in 1798 he was appointed by Lord Wellesley assistant to the resident at Hyderabad. In the last-mentioned capacity he highly distinguished himself by the manner in which he gave effect to the difficult measure of disbanding the French corps in the pay of the nizam. In 1799, under the walls of Seringapatam, began his intimacy with Colonel Arthur Wellesley, which in a short time ripened into a lifelong friendship. In the course of the same year he acted as first secretary to the commission appointed to settle the Mysore government, and before its close he was appointed by Lord Wellesley to proceed as envoy to the court of Persia for the purpose of counteracting the policy of the French by inducing that country to form a British alliance. Arriving at Teheran in December 1800, he was successful in negotiating favourable treaties, both political and commercial, and returned to Bombay by way of Bagdad in May 1801. He now for some time held the interim post of private secretary to Lord Wellesley, and in 1803 was appointed to the Mysore residency. At the close of the Mahratta War, in 1804, and again in 1805, he negotiated important treaties with Sindhia and Holkar, and in 1806, besides seeing the arrangements arising out of these alliances carried out, he directed the difficult work of reducing

the immense body of irregular native troops. In 1808 he was again sent on a mission to Persia, but circumstances prevented him from getting beyond Bushire; on his reappointment in 1810, he was successful indeed in procuring a favourable reception at court, but otherwise his embassy, if the information which he afterwards incorporated in his works on Persia be left out of account, was (through no fault of his) without any substantial result. He sailed for England in 1811, and shortly after his arrival in the following year was knighted. His intervals of leisure he devoted to literary work, and especially to the composition of a *History of Persia*, which was published in two quarto volumes in 1815. On his return to India in 1817 he was appointed by Lord Moira his political agent in the Deccan, with eligibility for military command; as brigadier-general under Sir T. Hislop he took a distinguished part in the victory of Mehidpur (December 21, 1817), as also in the subsequent work of following up the fugitives, determining the conditions of peace and settling the country. In 1821 he returned once more to England, where he remained until 1827, when he was appointed governor of Bombay. His influence in this office was directed to the promotion of various economical reforms and useful administrative measures. Leaving India for the last time in 1830, he shortly after his arrival in England entered parliament as member for Launceston, and was an active opponent of the Reform Bill. He died of paralysis on the 30th of May 1833.

Besides the work mentioned above, Sir John Malcolm published *Sketch of the Political History of India since ... 1784* (in 1811 and 1826); *Sketch of the Sikhs* (1812); *Observations on the Disturbances in the Madras Army in 1809* (1812); *Persia, a Poem*, anonymous (1814); *A Memoir of Central India* (2 vols., 1823); and *Sketches of Persia*, anonymous (1827). A posthumous work, *Life of Robert, Lord Clive*, appeared in 1836. See *Life and Correspondence of Sir John Malcolm*, by J. W. Kaye (2 vols., 1856).

MALDA, a district of British India, in the Rajshahi division of Eastern Bengal and Assam. Area, 1899 sq. m.; pop. (1901), 884,030, showing an increase of 8.5 in the decade. The administrative headquarters are at English Bazar (pop. 13,667) near the town of Old Malda. The district is divided into two almost equal parts by the Mahananda river, flowing from north to south. The western tract between the Mahananda and the main stream of the Ganges is an alluvial plain of sandy soil and great fertility. The eastern half is an elevated region broken by the deep valleys of the Tangan and Purnabhaba rivers and their small tributary streams. The soil here is a hard red clay; and the whole is overgrown with thorny tree jungle known as the *kātāl*. Agricultural prosperity centres on the Mahananda, where mango orchards and high raised plots of mulberry land extend continuously along both banks of the river. The Ganges nowhere intersects the district, but skirts it from its north-western corner to the extreme south. The Mahananda flows in a deep well-defined channel through the centre, and joins the Ganges at the southern corner. Its tributaries are the Kalindri on the right, and the Tangan and Purnabhaba on the left bank. The two principal industries are the production of indigo and silk. The first has declined, and so has the second as far as concerns the weaving of piece goods, but the rearing of silkworms and the export of raw silk and silk thread are carried on upon a large scale. No railway touches the district, but the communications by water are good.

Malda supplied two great capitals to the early Mahommedan kings of Bengal; and the sites of Gaur and Pandua exhibit the most interesting remains to be found in the lower valley of the Ganges. (See GAUR.) The connexion of the East India Company with Malda dates from a very early period. As far back as 1676 there was a factory there. In 1770 English Bazar was fixed upon for a commercial residency, the buildings of which at the present day form both the public offices and private residence of the collector.

MALDEN, a city, including several villages, of Middlesex county, Massachusetts, U.S.A., on the Malden river, about 5 m. N. of Boston. Pop. (1890), 23,031, (1900), 33,664, of whom 9513 were foreign-born, 3673 being English Canadians, 870 English, and 617 Swedes; (1910 census) 44,404. Malden had in 1906 a land area of 4.78 sq. m. It is served by the Boston & Maine railroad, and by inter-urban electric railways. Although it is largely a residential suburb of Boston—its post office is a Boston sub-station—it has important manufacturing industries. The most valuable manufactured product is rubber boots and shoes. The capital invested in manufacturing in 1905 was $5,553,432; and the value of the factory product, $11,235,635, was 70.2% greater than the value of the factory product in 1900. Among Malden's institutions are the public library (endowed by Elisha S. Converse), the Malden hospital, the Malden day nursery, a Young Men's Christian Association, and a home for the aged. A fine system of parks is maintained; the best known is possibly Pine Banks. To the north and west is the Middlesex Fells, a state reservation; about 60 acres of this and about 20 acres of the Middlesex Fells Parkway lie within Malden. Malden, when first settled about 1640, was part of Charlestown, and was known for some years as Mystic Side. It was incorporated as a town under the name of "Mauldon" in 1640, and was chartered as a city in 1881. The north part of Malden was set off in 1850 to form Melrose, and the south part in 1870 to form the town of Everett. Malden was the birthplace of Adoniram Judson, the "apostle to Burma." Michael Wigglesworth was pastor here from 1656 until 1705.

See D. P. Corey, *History of Malden* (Malden, 1899); and *Malden, Past and Present* (Malden, 1899).

MALDIVE ISLANDS, an archipelago of coral islets in the Indian Ocean, forming a chain between 7° 6′ N. and 0° 42′ S. It consists of seventeen atolls with an immense number of islands, of which some three hundred are inhabited. In the extreme south are the isolated atolls of Addu and Fua-Mulaku, separated from Suvadiva by the Equatorial Channel, which is itself separated from the main chain of atolls by One-and-a-half-degree Channel.[1] Following the chain northward from this channel, we have Haddumati and Kolumadulu, after which the chain becomes double: to the east the chief atolls are Mulaku, Felidu, South Malé, North Malé, Kardiva (where the channel of the same name, 35 m. broad, partly breaks the chain), and Fadiffolu. To the west are South Nilandu, North Nilandu, Ari, South Mahlos, North Mahlos and Miladumadulu. To the north again are Tiladumati and Ihavandifulu. Finally, to the north of Eight-degree Channel is Minikoi, 71 m. from the nearest point of the Maldives, and 110 m. from that of the Laccadives to the north. The main part of the archipelago, north of One-and-a-half-degree Channel, consists of a series of banks either surrounded or studded all over with reefs (see J. S. Gardiner, "Formation of the Maldives," in *Geographical Journ.* xix. 277 seq.). Mr Gardiner regarded these banks as plateaus rising to different elevations beneath the surface of the sea from a main plateau rising steeply from the great depths of the Indian Ocean.

After the Portuguese, from about 1518 onwards, had attempted many times to establish themselves on the islands by force, and after the Maldivians had endured frequent raids by the Mopla pirates of the Malabar coast, they began to send tokens of homage and claims of protection (the first recorded being in 1645) to the rulers of Ceylon, and their association with this island has continued practically ever since. The hereditary sultan of the archipelago is tributary to the British government of Ceylon. The population of the Maldives is estimated at 30,000. All are Mahommedans. By Messrs. Gardiner and Cooper they are classed in four ethnological divisions. (1) Those of the atolls north of the Kardiva Channel. Here the reefs are generally less perfect than elsewhere, seldom forming complete central lagoons, and as they were formerly exposed to the constant attacks of the Mopla pirates from India, the people are hardier and more vigorous than their less warlike southern neighbours. They annually visited the coasts of India or Ceylon, and often married Indian wives, thus acquiring distinct racial characters of an approximately Dravidian type. (2) Those of the central division, comprising the atolls between North Malé and Haddumati, who are under the direct rule of the sultan, and have been more exposed to Arab influences. They formerly traded with Arabia and Malaysia, and many Arabs settled amongst them, so that they betray a strong strain of Semitic blood in their features. (3 and 4) The natives of Suvadiva, Addu, Mulaku and the other southern clusters, who have had little communication with the Central Malé people, and probably preserve more of the primitive type, approximating in appearance to the Sinhalese villagers of Ceylon. They are an intelligent and industrious people, growing their own crops, manufacturing their own cloth and mats, and building their own boats, while many read Arabic more or less fluently, although still believers in magic and witchcraft. The language is a dialect of Sinhalese, but indicating a separation of ancient date and more or less mahommedanized.

The sultan's residence and the capital of the archipelago is the island of Malé. From the earliest notices the production of coir, the collection of cowries, and the weaving of excellent textures on these islands have been noted. The chief exports of the islands besides coir and cowries (a decreasing trade) are coco-nuts, copra, tortoise-shell and dried bonito-fish.

Minikoi atoll, with the numerous wrecks on its reefs, its lighthouse, and its position on the track of all eastward-bound vessels, is a familiar sight to seafarers in these waters. The atoll, which is pear-shaped and disposed in the direction from S.W. to N.E. is 5 m. long, with an extreme breadth of nearly 3 m., with a large but shallow lagoon approached from the north by a passage two fathoms deep. The atoll is growing outwards on every side, and at one place rises 19 ft. above sea-level. The population, which numbers about 3000, is sharply divided into five castes, of which the three highest are pure Maldivians, the lower two the same as in the Laccadives. All are centred in a small village opposite Mou Rambu Point on the west or lagoon side; but most of the men are generally absent, many being employed with the Lascar crews on board the large liners plying in the eastern seas.

In 1899-1900 Messrs. J. Stanley Gardiner and C. Forster Cooper carried out an expedition to the Maldives and Laccadives, for the important results of which see *The Fauna and Geography of the Maldive and Laccadive Archipelagoes*, ed. J. S. Gardiner (Cambridge, 1901-1905), also *Proceedings of the Cambridge Philosophical Society*, vol. xi. pt. 1 (1900), and the *Geographical Journ.*, *loc. cit.*, &c. A French adventurer, François Pyrard de la Val, was wrecked in the Maldives in 1602 and detained there five years; he wrote an interesting account of the archipelago, *Voyage de F. P. de la Val* (Paris, 1679; previous editions 1611, &c.). See also A. Agassiz, "An Expedition to the Maldives" in *Amer. Journ. Science*, vol. xiii. (1902).

1 These and other channels in the locality are named from their position under parallels of latitude.

MALDON, a market town, municipal borough and port, in the Maldon parliamentary borough of Essex, England, on an acclivity rising from the south side of the Blackwater, 43 m. E.N.E. from London by a branch from Witham of the Great Eastern railway. Pop. (1901), 5565. There are east and west railway stations. The church of All Saints, dating from 1056, but, as it stands, Early English and later, consists of chancel, nave and

aisles, with a triangular Early English tower (a unique form) at the west end surmounted by a hexagonal spire. The tower of St Mary's Church shows Norman work with Roman materials. The other public buildings are the grammar school, founded in 1547; the town-hall, formerly D'Arcy's tower, built in the reign of Henry VI.; and the public hall. There are manufactures of crystallized salt, breweries, an oyster fishery and some shipping. On Osea Island, in the Blackwater estuary, there is a farm colony for the unemployed. A mile west of Maldon are remains of Beeleigh Abbey, a Premonstratensian foundation of the 12th century. They consist of the chapter-house and another chamber, and are of fine Early English work. The borough is under a mayor, 4 aldermen and 12 councillors. Area, 3028 acres.

At Maldon (*Maelduna*, *Melduna*, *Mealdon* or *Meaudon*) palaeolithic, neolithic and Roman remains that have been found seem to indicate an early settlement. It is not, however, an important Roman site. An earthwork, of which traces exist, may be Saxon or Danish. The Anglo-Saxon Chronicle relates that Edward the Elder established a "burh" there about 921, and that Ealdorman Brihtnoth was killed there by the Danes in 991. The position of Maldon may have given it some commercial importance, but the fortress is the point emphasized by the Chronicle. Maldon remained a royal town up to the reign of Henry I., and thus is entered as on *terra regis* in Domesday. Henry II. granted the burgesses their first charter, probably in 1155, giving them the land of the borough and suburb with sac and soc and other judicial rights, also freedom from county and forest jurisdiction, danegeld, scutage, tallage and all tolls, by the service of one ship a year for forty days. This charter was confirmed by Edward I. in 1290, by Edward III. in 1344, and by Richard II. in 1378. In 1403 the bishop of London granted further judicial and financial rights, and Henry V. confirmed the charters in 1417, Henry VI. in 1443, and Henry VIII. in 1525. Maldon was incorporated by Philip and Mary in 1554, and received confirmatory charters from Elizabeth in 1563 and 1592, from Charles I. in 1631, Charles II. and James II. In 1768 the incorporation charter was regranted, with modifications in 1810.

MALEBRANCHE, NICOLAS (1638-1715), French philosopher of the Cartesian school, the youngest child of Nicolas Malebranche, secretary to Louis XIII., and Catherine de Lauzon, sister of a viceroy of Canada, was born at Paris on the 6th of August 1638. Deformed and constitutionally feeble, he received his elementary education from a tutor, and left home only when sufficiently advanced to enter upon a course of philosophy at the Collège de la Marche, and subsequently to study theology at the Sorbonne. He had resolved to take holy orders, but his studious disposition led him to decline a stall in Notre Dame, and in 1660 he joined the congregation of the Oratory. He was first advised by Père Lecointe to devote himself to ecclesiastical history, and laboriously studied Eusebius, Socrates, Sozomen and Theodoret, but "the facts refused to arrange themselves in his mind, and mutually effaced one another." Richard Simon undertook to teach him Hebrew and Biblical criticism with no better success. At last in 1664 he chanced to read Descartes's *Traité de l'homme* (*de homine*), which moved him so deeply that (it is said) he was repeatedly compelled by palpitations of the heart to lay aside his reading. Malebranche was from that hour consecrated to philosophy, and after ten years' study of the works of Descartes he produced the famous *De la recherche de la vérité*, followed at intervals by other works, both speculative and controversial. Like most of the great metaphysicians of the 17th century, Malebranche interested himself also in questions of mathematics and natural philosophy, and in 1699 was admitted an honorary member of the Academy of Sciences. During his later years his society was much courted, and he received many visits from foreigners of distinction. He died on the 13th of October 1715; his end was said to have been hastened by a metaphysical argument into which he had been drawn in the course of an interview with Bishop Berkeley. For a critical account of Malebranche's place in the history of philosophy, see CARTESIANISM.

WORKS.—*De La recherche de la vérité* (1674; 6th ed., 1712; ed. Bouillier, 1880; Latin trans, by J. Lenfant at Geneva in 1685; English trans. by R. Sault, 1694; and T. Taylor, 1694, 1712); *Conversations chrétiennes* (1677, and frequently; Eng. trans., London, 1695); *Traité de la nature et de la grâce* (1680; Eng. trans., London, 1695); *Méditations chrétiennes et métaphysiques* (1683); *Traité de morale* (1684; separate ed. by H. Joly, 1882; Eng. trans, by Sir J. Shipton, 1699); several polemical works against Arnauld from 1684 to 1688; *Entretiens sur la métaphysique et sur la religion* (1688); *Traité de l'amour de Dieu* (1697); *Entretiens d'un philosophe chrétien et d'un philosophe chinois sur l'existence et la nature de Dieu* (1708); *Réflexions sur la prémotion physique* (1715).

A convenient edition of his works in two volumes, with an introduction, was published by Jules Simon in 1842. A full account by Mrs Norman Smith of his theory of vision, in which he unquestionably anticipated and in some respects surpassed the subsequent work of Berkeley, will be found in the *British Journal of Psychology* (Jan. 1905). For recent criticism see H. Joly, in the series *Les Grands philosophes* (Paris, 1901); L. Ollé-Laprune, *La Philosophie de Malebranche* (1870); M. Novaro, *Die Philosophie des Nicolaus Malebranche* (1893).

MALER KOTLA, a native state of India, within the Punjab. It ranks as one of the Cis-Sutlej states, which came under British influence in 1809. The territory lies south of Ludhiana. Area, 167 sq. m. Pop. (1901), 77,506, showing an increase of 2% in the decade. Estimated gross revenue, £30,100. The military force numbers 280 men; and there is no tribute. The town Maler Kotla is 30 m. S. of Ludhiana; pop. (1901), 21,122.

The nawab or chief is of Afghan descent; his family originally came from Kabul, and occupied positions of trust in Sirhind under the Mogul emperors. They gradually became independent as the Mogul Empire sank into decay in the course of the 18th century. In General Lake's campaign against Holkar in 1805 the nawab of Maler Kotla sided with the British. After the subjugation and flight of Holkar, the English government succeeded to the power of the Mahrattas in the districts between the Sutlej and the Jumna; and in 1809 its protection was formally extended to Maler Kotla, as to the other Cis-Sutlej states, against the formidable encroachments of Ranjit Singh. In the campaigns of 1806, 1807 and 1808 Ranjit Singh had made considerable conquests across the Sutlej; in 1808 he marched on Maler Kotla and demanded a ransom of £10,000 from the nawab. This led to the interference of the British, who addressed an ultimatum to Ranjit Singh, declaring the Cis-Sutlej states to be under British protection. Finally the raja of Lahore submitted, and the nawab was reinstated in February 1809. Owing to the mental incapacity of nawab Ibrahim Ali Khan, the state was administered in recent years for some time by the chief of Loharu; but his son, Ahmed Ali Khan, was made regent in February 1905.

See *Maler Kotla State Gazetteer* (Lahore, 1908).

MALESHERBES, CHRÉTIEN GUILLAUME DE LAMOIGNON DE (1721-1794),

commonly known as Lamoignon-Malesherbes, French statesman, minister, and afterwards counsel for the defence of Louis XVI., came of a famous legal family. He was born at Paris on the 6th of December 1721, and was educated for the legal profession. The young lawyer soon proved his intellectual capacity, when he was appointed president of the *cour des aides* in the parlement of Paris in 1750 on the promotion of his father, Guillaume de Lamoignon, to be chancellor. One of the chancellor's duties was to control the press, and this duty was entrusted to Malesherbes by his father during his eighteen years of office, and brought him into connexion with the public far more than his judicial functions. To carry it out efficiently he kept in communication with the literary leaders of Paris, and especially with Diderot, and Grimm even goes so far as to say that "without the assistance of Malesherbes the *Encyclopédie* would probably never have been published." In 1771 he was called upon to mix in politics; the parlements of France had been dissolved, and a new method of administering justice devised by Maupeou, which was in itself commendable as tending to the better and quicker administration of justice, but pernicious as exhibiting a tendency to over-centralization, and as abolishing the hereditary "nobility of the robe," which, with all its faults, had from its nature preserved some independence, and been a check on the royal power. Malesherbes presented a strong remonstrance against the new system, and was at once banished to his country seat at St Lucie, to be recalled, however, with the old parlement on the accession of Louis XVI., and to be made minister of the *maison du roi* in 1775. He only held office nine months, during which, however, he directed his attention to the police of the kingdom, which came under his department, and did much to check the odious practice of issuing *lettres de cachet*. The protest of the *cour des aides* in 1775 is one of the most important documents of the old régime in France. It gives a complete survey of the corrupt and inefficient administration, and presented the king with most outspoken criticism. On retiring from the ministry with Turgot in 1776, he betook himself entirely to a happy country and domestic life and travelled through Switzerland, Germany and Holland. An essay on Protestant marriages (1787) did much to procure for them the civil recognition in France. He had always been an enthusiastic botanist; his avenue at St Lucie was world famous; he had written against Buffon on behalf of the botanists whom Buffon had attacked, and had been elected a member of the *Académie des sciences* as far back as 1750. He was now elected a member of the *Académie française*, and everything seemed to promise a quiet and peaceful old age spent in the bosom of his family and occupied with scientific and literary pursuits, when the king in his difficulties wished for the support of his name, and summoned him back to the ministry in 1787. Lamoignon-Malesherbes held office but a short time, but returned to his country life this time with a feeling of insecurity and disquiet, and, as the troubles increased, retired to Switzerland. Nevertheless, in December 1792, in spite of the fair excuse his old age and long retirement would have given him, he voluntarily left his asylum and undertook with Tronchet and Desèze the defence of the king before the Convention, and it was his painful task to break the news of his condemnation to the king. After this effort he returned once more to the country, but in December 1793 he was arrested with his daughter, his son-in-law M. de Rosambo, and his grandchildren, and on the 23rd of April 1794 he was guillotined, after having seen all whom he loved in the world executed before his eyes for their relationship to him. Malesherbes is one of the sweetest characters of the 18th century; though no man of action, hardly a man of the world, by his charity and unfeigned goodness he became one of the most popular men in France, and it was an act of truest self-devotion in him to sacrifice himself for a king who had done little or nothing for him.

There are in print several scientific works of Malesherbes of varying value, of which the most interesting is his *Observations sur Buffon et Daubenton*, written when he was very young, and published with a notice by Abeille in 1798. There exist also his *Mémoire pour Louis XVI.*, his *Mémoire sur la liberté de la presse* (published 1809) and extracts from his remonstrances, published as *Œuvres choisies de Malesherbes* in 1809. For his life should be read the *Notice historique* (3rd ed., 1806) of Dubois, the *Éloge historique* (1805) of Gaillard, and the interesting *Essai sur la vie, les écrits et les opinions de M. de Malesherbes* (in 2 vols., 1818), of F. A. de Boissy d'Anglas. There are also many éloges on him in print, of which the best-known is that of M. Dupin, which was delivered at the Academy in 1841, and was reviewed with much light on Malesherbes's control of the press by Sainte-Beuve in the 2nd volume of the *Causeries du lundi*. The protest of the *cour des aides* has been published with translation by G. Robinson in the *Translations and Reprints of the University of Pennsylvania* (1900). For his defence of Louis XVI. see Marquis de Beaucourt, *Captivité et derniers moments de Louis XVI.* (2 vols., 1892, Soc. d'hist. contemp.), and A. Tuetey, *Répertoire général des sources manuscrites de l'hist. de Paris pendant la Rev. fr.*, vol. viii. (1908).

MALET, LUCAS, the pen-name of Mary St Leger Harrison (1852-), English novelist. She was the eldest daughter of Charles Kingsley, and was born at Eversley on the 4th of June 1852. She studied at the Slade school and at University College, London, and married in 1876 William Harrison, rector of Clovelly. After her husband's death in 1897 she eventually settled in London. She had already written several books —*Mrs Lorimer* (1882), *Colonel Enderby's Wife* (1885), *Little Peter* (1887), *A Counsel of Perfection* (1888)— when she published her powerful story, *The Wages of Sin* (1891), which attracted great attention. Her *History of Sir Richard Calmady* (1901) had an even greater success. Her other novels include *The Carissima* (1896), *The Gateless Barrier* (1900), *On the Far Horizon* (1906).

MALHERBE, FRANÇOIS DE (1555-1628), French poet, critic and translator, was born at Caen in 1555. His family was of some position, though it seems not to have been able to establish to the satisfaction of heralds the claims which it made to nobility older than the 16th century. The poet was the eldest son of another François de Malherbe, *conseiller du roi* in the magistracy of Caen. He himself was elaborately educated at Caen, at Paris, at Heidelberg and at Basel. At the age of twenty-one, preferring arms to the gown, he entered the household of Henri d'Angoulême, grand prior of France, the natural son of Henry II. He served this prince as secretary in Provence, and married there in 1581. It seems that he wrote verses at this period, but, to judge from a quotation of Tallemant des Réaux, they must have been very bad ones. His patron died when Malherbe was on a visit in his native province, and for a time he had no particular employment, though by some servile verses he obtained a considerable gift of money from Henry III., whom he afterwards libelled. He lived partly in Provence and partly in Normandy for many years after this event; but very little is known of his life during this period. His *Larmes de Saint Pierre*, imitated from Luigi Tansillo, appeared in 1587.

It was in the year parting the two centuries (1600) that he presented to Marie de' Medici an ode of welcome, the first of his remarkable poems. But four or five years more passed before his fortune, which had hitherto been indifferent, turned. He was presented by his countryman, the Cardinal Du Perron, to Henry IV.; and, though that economical prince did not at first show any great eagerness to entertain the poet, he was at last summoned to court and endowed after one fashion or another. It is said that the pension promised him was not paid till the next reign. His father died in 1606, and he came into his inheritance. From this time forward he lived at court, corresponding affectionately with his wife, but seeing her only twice in some twenty years. His old age was saddened by a great misfortune. His son, Marc Antoine, a young man of promise, fell in a duel in 1626. His father used his utmost influence to have the guilty parties (for more than one were concerned, and there are grounds for thinking that it was not a fair duel) brought to justice. But he died before the suit was decided (it is said in consequence of disease caught at the camp of La Rochelle, whither he had gone to petition the king), in Paris, on the 16th of October, 1628, at the age of seventy-three.

The personal character of Malherbe was far from amiable, but he exercised, or at least indicated the exercise of, a great and enduring effect upon French literature, though by no means a wholly beneficial one. The lines of Boileau beginning *Enfin Malherbe vint* are rendered only partially applicable by the extraordinary ignorance of older French poetry which distinguished that peremptory critic. But the good as well as bad side of Malherbe's theory and practice is excellently described by his contemporary and superior Regnier, who was animated against him, not merely by reason of his own devotion to Ronsard but because of Malherbe's discourtesy towards Regnier's uncle P. Desportes, whom the Norman poet had at first distinctly copied. These are the lines:—

"Cependant leur savoir ne s'étend nullement
Qu'à régratter un mot douteuse au jugement,
Prendre garde qu'un *qui* ne heurte une diphthongue,
Epier si des vers la rime est brève ou longue,
Ou bien si la voyelle à l'autre s'unissant
Ne rend point à l'oreille un vers trop languissant.
. . . . . .
C'est proser de la rime et rimer de la prose."

This is perfectly true, and from the time of Malherbe dates that great and deplorable falling off of French poetry in its more poetic qualities, which was not made good till 1830. Nevertheless the critical and restraining tendency of Malherbe was not ill in place after the luxuriant importation and innovation of the *Pléiade*; and if he had confined himself to preaching greater technical perfection, and especially greater simplicity and purity in vocabulary and versification, instead of superciliously striking his pen through the great works of his predecessors, he would have deserved wholly well. As it was, his reforms helped to elaborate the kind of verse necessary for the classical tragedy, and that is the most that can be said for him. His own poetical work is scanty in amount, and for the most part frigid and devoid of inspiration. The beautiful *Consolation à Duperier*, in which occurs the famous line—

Et, rose, elle a vécu ce que vivent les roses—

the odes to Marie de' Medici and to Louis XIII., and a few other pieces comprise all that is really worth remembering of him. His prose work is much more abundant, not less remarkable for care as to style and expression, and of greater positive value. It consists of some translations of Livy and Seneca, and of a very large number of interesting and admirably written letters, many of which are addressed to Peiresc, the man of science of whom Gassendi has left a delightful Latin life. It contains also a most curious commentary on Desportes, in which Malherbe's minute and carping style of verbal criticism is displayed on the great scale.

The chief authorities for the biography of Malherbe are the *Vie de Malherbe* by his friend and pupil Racan, and the long *Historiette* which Tallemant des Réaux has devoted to him. The standard edition is the admirable one of Ludovic Lalanne (5 vols., Paris, 1862-1869). Of the poems only, there is an excellent and handsome little issue in the *Nouvelle collection Jannet* (Paris, 1874). Of modern works devoted to him, *La Doctrine de Malherbe*, by G. Brunot (1891), is not only the most important but a work altogether capital in regard to the study of French language and literature. Others are A. Gasté, *La Jeunesse de Malherbe* (1890); V. Bourrienne, *Points obscurs dans la vie normande de Malherbe* (1895); and the duc de Broglie's "Malherbe" in *Les Grands écrivains français*. On his position in French and general critical history, G. Saintsbury's *History of Criticism*, vol. ii., may be consulted.

(G. Sa.)

MALIBRAN, MARIE FÉLICITÉ (1808-1836), operatic singer, daughter of Manoel Garcia, was born in Paris on the 24th of March 1808. Her father was then a member of the company of the Théâtre des Italiens, and she accompanied him to Italy and London. She possessed a soprano voice of unusual beauty and phenomenal compass, which was carefully cultivated by her father. She was only seventeen when, in consequence of an indisposition of Madame Pasta, she was suddenly asked to take her place in *The Barber of Seville* at Covent Garden. She was forthwith engaged for the remaining six weeks of the season, and then followed her father to New York, where she appeared in *Othello*, *The Barber of Seville*, *Don Juan*, *Romeo and Juliet*, *Tancred*. Her gifts as an actress were on a par with her magnificent voice, and her gaiety made her irresistible in light opera, although her great triumphs were obtained chiefly in tragic parts. She married a French banker of New York, named Malibran, who was much older than herself. The marriage was an unhappy one, and Mme Malibran returned alone to Europe in 1828, when she began the series of representations at the Théâtre des Italiens, which excited an enthusiasm in Paris only exceeded by the reception she received in the principal towns of Italy. She was formally divorced from Malibran in 1835, and married the Belgian violinist, Charles de Beriot; but she died of fever on the 23rd of September 1836.

See *Memoirs of Mme Malibran by the comtesse de Merlin and other intimate friends, with a selection from her correspondence* (2 vols., 1840); and M. Teneo, *La Malibran, d'après des documents inédits*, in *Sammelbände der internationalen Musik-Gesellschaft* (Leipzig, 1906).

MALIC ACID (Hydroxyethylene Succinic Acid), $C_4H_6O_5$, an organic acid found abundantly in the juices of many plants, particularly in mountain-ash berries, in unripe apples and in grapes. The acid potassium salt is also found in the leaves and stalks of rhubarb. Since the acid contains an asymmetric carbon atom, it can exist in three forms, a dextro-rotatory, a laevo-rotatory and an inactive form; the acid obtained in the various synthetical processes is the inactive form. It may be prepared by heating racemic acid (see Tartaric Acid) with fuming hydriodic acid; by heating fumaric acid (*q.v.*) with water at 150-200° C.; by the action of nitrous acid on inactive aspartic acid; and by the action of moist silver oxide on monobromsuccinic acid. It forms deliquescent crystals, which are readily soluble in alcohol and melt at 100° C. When heated for some time at 130° C. it yields fumaric acid (*q.v.*), and on rapid heating at 180° C. gives maleic anhydride and fumaric acid. It yields coumarins when warmed with sulphuric acid and phenols (H. v. Pechmann, *Ber.*, 1884, 17, 929, 1649 et seq.). Potassium bichromate oxidizes it to malonic acid; nitric acid oxidizes it to oxalic acid; and hydriodic acid reduces it to succinic acid. The inactive variety may be split into the component active forms by means of its cinchonine salt (G. J. W. Bremer, *Ber.*, 1880, 13, 352).

MALIGNANT (Lat. *malignus*, evil-disposed, from *maligenus*), wicked, of a malicious or wilfully evil disposition. The word was early applied by the Protestants to the Romanists, with an allusion to the "congregation of evil doers" (Vulgate *Ecclesiam malignantium*) of Psalm xxvi. 5. In English history, during the Great Rebellion, the name was given to the Royalists by the Parliamentary party. In the Great Remonstrance of 1641 occur the words "the malignant partie, wherof the Archbishop (Laud) and the earl of Strafford being heads." The name throughout the period had special reference to the religious differences between the parties. In medical science, the term "malignant" is applied to a particularly virulent or dangerous form which

a disease may take, or to a tumour or growth of rapid growth, extension to the lymphatic glands, and recurrence after operation.

MALIK IBN ANAS (*c.* 718-795), the founder of the Malikite school of canon law, was born at Medina about A.D. 718: the precise date is not certain. He studied and passed his life there, and came to be regarded as the greatest local authority in theology and law. (For his legal system and its history see MAHOMMEDAN LAW.) His life was one of extreme honour and dignity, but uneventful, being given to study, lecturing on law and acting as muftī and judge. Only two episodes stand out in his biography. When Mahommed ibn ʻAbdallāh, the ʻAlid, rose in A.D. 762 at Medina against the ʻAbbāsids, Malik gave a *fatwā*, or legal opinion, that the oath of allegiance to the ʻAbbāsids was invalid, as extorted by force. For this independence he was severely scourged by the ʻAbbāsid governor, who, apparently, did not dare to go beyond scourging with a man of his standing with the people. The second episode gave equal proof of independence. In 795 Hārūn al-Rashīd made the pilgrimage, came with two of his sons to Medina, and sat at the feet of Malik as he lectured in the mosque. The story, legendary or historical, adds that Malik had refused to go to the caliph, saying that it was for the student to come to his teacher. Late in life he seems to have turned to asceticism and contemplation. It is said that he retired from all active, public life and even neglected plain, public duties, replying to reproaches, "Not every one can speak in his own excuse" (Ibn Qutaiba, *Maʻārif*, 250). He is also entered among the early ascetic Sūfis (cf. *Fihrist*, 183). He died in Medina, A.D. 795.

For a description of his principal book, the *Muwaṭṭaʼ*, see Goldziher's *Muhammedanische Studien*, ii. 213 sqq. He wrote also a Koran commentary, now apparently lost, and a hortatory epistle to Hārūn al-Rashīd. See further, de Slane's trans. of Ibn Khallikān, ii. 545 sqq.; von Kremer, *Culturgeschichte*, i. 477 sqq.; Brockelmann, *Gesch. der arab. Litt.*, i. 175 sqq.; Macdonald, *Muslim Theology, &c.*, 99 sqq. and index; *Fihrist*, 198 seq.; Nawawi, 530 sqq.

(D. B. MA.)

MALINES (Flemish, *Mechelen*, called in the middle ages by the Latin name Mechlinia, whence the spelling Mechlin), an ancient and important city of Belgium, and the seat since 1559 of the only archbishopric in that country. Pop. (1904), 58,101. The name is supposed to be derived from *maris linea*, and to indicate that originally the sea came up to it. It is now situated on the Dyle, and is in the province of Antwerp, lying about half-way between Antwerp and Brussels. The chief importance of Malines is derived from the fact that it is in a sense the religious capital of Belgium—the archbishop being the primate of the Catholic Church in that country. The archbishop's palace is in a picturesque situation, and dates from the creation of the dignity. The principal building in the city is the exceedingly fine cathedral dedicated to St Rombaut. This cathedral was begun in the 12th and finished early in the 14th century, and although modified in the 15th after a fire, it remains one of the most remarkable specimens of Gothic architecture in Europe. The massive tower of over 300 ft., which is described as unfinished because the original intention was to carry it to 500 ft., is its most striking external feature. The people of Malines gained in the old distich—"gaudet Mechlinia stultis"—the reputation of being "fools," because one of the citizens on seeing the moon through the dormer windows of St Rombaut called out that the place was on fire, and his fellow-citizens, following his example, endeavoured to put out the conflagration until they realized the truth. The cathedral contains a fine altar-piece by Van Dyck, and the pulpit is in carved oak of the 17th century. Another old palace is that of Margaret of Austria, regent for Charles V., which has been carefully preserved and is now used as a court of justice. In the church of Notre Dame (16th century) is Rubens' masterpiece "the miraculous draught of fishes," and in that of St John is a fine triptych by the same master. Malines, although no longer famous for its lace, carries on a large trade in linen, needles, furniture and oil, while as a junction for the line from Ghent to Louvain and Liège, as well as for that from Antwerp to Brussels and the south, its station is one of the busiest in Belgium, and this fact has contributed to the general prosperity of the city.

The lordship of Malines was conferred as a separate fief by Pippin the Short on his kinsman Count Adon in 754. In the 9th century Charles the Bald bestowed the fief on the bishop of Liége, and after being shared between Brabant and Flanders it passed into the hands of Philip the Bold, founder of the house of Burgundy, in 1384. During the religious troubles of the 16th century Malines suffered greatly, and in 1572 it was sacked by Alva's troops during three days. In the wars of the 17th and 18th centuries it was besieged many times and captured by the French, Dutch and English on several occasions. The French finally removed the fortifications in 1804, since which year it has been an open town.

MALLANWAN, a town in Hardoi district, the United Provinces, India. Pop. (1901), 11,158. Under

native rule the town possessed considerable political importance, and upon the British annexation of Oudh it was selected as the headquarters of the district, but was abandoned in favour of Hardoi after the Mutiny. Saltpetre and brass utensils are manufactured.

MALLARMÉ, FRANÇOIS RENÉ AUGUSTE (1755-1835), French Revolutionist, the son of a lawyer, was born at Nancy on the 25th of February 1755. He was brought up in his father's profession, and was appointed *procureur-syndic* of the district of Pont-à-Mousson. During the Revolution he was elected by the department of Meurthe deputy to the Legislative Assembly and the Convention, where he attached himself to the Mountain and voted for the death of Louis XVI. He was elected president of the Convention on the 30th of May 1793, and by his weakness during the crisis of the following day contributed much to the success of the insurrection against the Girondists. He took an active part in the *levée-en-masse*, and in November 1793 was given the task of establishing the revolutionary government in the departments of Meuse and Moselle, where he gained an unenviable notoriety by ordering the execution of the sentence of death decreed by the revolutionary tribunal on some young girls at Verdun who had offered flowers to the Prussians when they entered the town. After the fall of Robespierre he joined the group of "Thermidorians" and was sent on mission to the south of France, where he closed the Jacobin club at Toulouse and set free a number of imprisoned "suspects." On the 1st of June 1795 he was denounced and arrested, but was soon set at liberty. In 1796 he was appointed by the Directory commissioner for the organization of the departments of Dyle and Mont-Tonnerre. Under the empire he was receiver of the *droits réunis* at Nancy, and lost his money in 1814 in raising a levy of volunteers. Appointed sub-prefect of Avesnes during the Hundred Days, he was imprisoned by the Prussians in revenge for the death of the maidens of Verdun, and lived in exile during the Restoration. He returned to France after the revolution of 1830, and died at Richemont (Seine-Inférieure) on the 25th of July 1835.

MALLARMÉ, STÉPHANE (1842-1898), French poet and theorist, was born at Paris, on the 18th of March 1842. His life was simple and without event. His small income as professor of English in a French college was sufficient for his needs, and, with his wife and daughter, he divided the year between a fourth-floor flat in Paris and a cottage on the banks of the Seine. His Tuesday evening receptions, which did so much to form the thought of the more interesting of the younger French men of letters, were almost as important a part of his career as the few carefully elaborated books which he produced at long intervals. *L'Après-midi d'un faune* (1876) and other fragments of his verse and prose had been known to a few people long before the publication of the *Poésies complètes* of 1887, in a facsimile of his clear and elegant handwriting, and of the Pages of 1891 and the *Vers et prose* of 1893. His remarkable translation of poems of Poe appeared in 1888, "The Raven" having been published as early as 1875, with illustrations by Manet. *Divagations*, his own final edition of his prose, was published in 1897, and a more or less complete edition of the *Poésies*, posthumously, in 1899. He died at Valvins, Fontainebleau, on the 9th of September 1898. All his life Mallarmé was in search of a new aesthetics, and his discoveries by the way were often admirable. But he was too critical ever to create freely, and too limited ever to create abundantly. His great achievement remains unfinished, and all that he left towards it is not of equal value. There are a few poems and a few pieces of imaginative prose which have the haunting quality of Gustave Moreau's pictures, with the same jewelled magnificence, mysterious and yet definite. His later work became more and more obscure, as he seemed to himself to have abolished limit after limit which holds back speech from the expression of the absolute. Finally, he abandoned punctuation in verse, and invented a new punctuation, along with a new construction, for prose. Patience in the study of so difficult an author has its reward. No one in our time has vindicated with more pride the self-sufficiency of the artist in his struggle with the material world. To those who knew him only by his writings his conversation was startling in its clearness; it was always, like all his work, at the service of a few dignified and misunderstood ideas.

See also Paul Verlaine, *Les Poètes maudits* (1884); J. Lemaître, *Les Contemporains* (5th series, 1891); Albert Moekel, *Stéphane Mallarmé, un héros* (1899); E. W. Gosse, *French Profiles* (1905) and A. Symons, *The Symbolist Movement in Literature* (1900). A complete bibliography is given in the *Poètes d'aujourd'hui* (1880-1900, 11th ed., 1905) of MM. A. van Bever and P. Léautaud.

(A. Sy.)

MALLECO, a province of southern Chile, once a part of the Indian territory of Araucania (*q.v.*), lying between the provinces of Bio-Bio on the N. and E., Cautin on the S. and Arauco on the W. Area, 2973 sq. m. Pop. (1895), 98,032. It belongs to the rainy, forested region of southern Chile, and is thinly populated, a considerable part of its population being Araucanian Indians, who occupy districts in the Andean foothills.

Gold placer mining has attracted some attention, but the output is small. The principal industries are cattle and wheat raising and timber-cutting. The capital is Angol (pop., 7056 in 1895; estimated at 7638 in 1902), a small town in the northern part of the province, on the Malleco river, and a station on the Traiguen branch of the state railway. Traiguen (pop., 5732 in 1895; estimated at 7099 in 1902) in the southern part of the province is the second town in importance, and Victoria (pop., 6989 in 1895; estimated at 10,002 in 1902), about 20 m. E. of the last-named town, was for a time the terminal station of the main line of the railway.

MALLEMUCK, from the German rendering of the Dutch *Mallemugge* (which originally meant small flies or midges that madly whirl round a light), a name given by the early Dutch Arctic voyagers to the Fulmar (*q.v.*), of which the English form is nowadays most commonly applied by our sailors to the smaller albatrosses, of about the size of a goose, met with in the Southern Ocean—corrupted into "molly mawk," or "mollymauk." A number of species have been identified. *Diomedea irrorata* of West Peru is sooty-brown with white mottlings and a white head; *D. migripes* of the North Pacific is similar in colour but with white only near the eye and at the base of the tail and bill; *D. immutabilis* of Japan is darker but has a white head. *D. melanophrys* of the southern oceans has been found in summer both in California, in England, and as far north as the Faeroes. According to J. Gould the latter is the commonest species of albatross inhabiting the Southern Ocean, and its gregarious habits and familiar disposition make it well known to every voyager to or from Australia, for it is equally common in the Atlantic as well as the Pacific. The back, wings and tail are of a blackish-grey, but all the rest of the plumage is white, except a dusky superciliary streak, whence its name of black-browed albatross, as also its scientific epithet, are taken. The bill of the adult is of an ochreous-yellow, while that of the young is dark. This species breeds on the Falkland Islands. *D. bulleri* of the New Zealand seas is greyish-brown, with white underparts and rump and ashy head. *Diomedea* (or *Thalassogeron*) *culminata* and *chlororhyncha* of the southern seas, *D.* (or *T.*) *cauta* of Tasmania, *salvini* of New Zealand and *layardi* of the Cape resemble *D. bulleri*, but have a strip of naked skin between the plates of the maxilla towards its base. H. N. Moseley (*Notes of a Naturalist*, 130) describes *D. culminata* as making a cylindrical nest of grass, sedge and clay, with a shallow basin atop and an overhanging rim—the whole being about 14 in. in diameter and 10 in height. The bird lays a single white egg, which is held in a sort of pouch, formed by the skin of the abdomen, while she is incubating. The feet of *D. bulleri* are red, of *D. chlororhyncha* flesh-coloured, of the others yellow.

(A. N.)

MALLESON, GEORGE BRUCE (1825-1898), Indian officer and author, was born at Wimbledon, on the 8th of May 1825. Educated at Winchester, he obtained a cadetship in the Bengal infantry in 1842, and served through the second Burmese War. His subsequent appointments were in the civil line, the last being that of guardian to the young maharaja of Mysore. He retired with the rank of colonel in 1877, having been created C.S.I. in 1872. He died at Kensington, on the 1st of March 1898. He was a voluminous writer, his first work to attract attention being the famous "Red Pamphlet," published at Calcutta in 1857, when the Mutiny was at its height. He continued, and considerably rewrote the *History of the Indian Mutiny* (6 vols., 1878-1880), which was begun but left unfinished by Sir John Kaye. Among his other books the most valuable are *History of the French in India* (2nd ed., 1893) and *The Decisive Battles of India* (3rd ed., 1888).

MALLET (or MALLOCH), DAVID (?1705-1765), Scottish poet and dramatist, the son of a Perthshire farmer, was born in that county, probably in 1705. In 1717 he went to the high school at Edinburgh, and some three years later to the university, where he made the friendship of James Thomson, author of *The Seasons*. As early as 1720 he began to publish short poems in the manner of the period, a number of which appeared during the next few years in collections such as the *Edinburgh Miscellany* and Allan Ramsay's *Tea Table Miscellany*, in which his ballad "William and Margaret" was published in 1724. For some years from 1723 he was private tutor to the duke of Montrose's sons, with whom he travelled on the Continent in 1727. His real name was Malloch; but this he changed to Mallet in 1724. In 1735 he took the M.A. degree at Oxford. He had already made the friendship of Pope, whose vanity he flattered in a poem on *Verbal Criticism*, in 1733; and through Pope he became acquainted with Bolingbroke and other Tory politicians, especially those attached to the party of the prince of Wales, who in 1742 appointed Mallet to be his paid secretary. After Pope's death, in 1744, Mallet, at the instigation of Bolingbroke and forgetful of past favours and friendship, vilified the poet's memory, thereby incurring the resentment of Pope's friends. For his services as a party pamphleteer, in which character he published an attack on Admiral Byng, Mallet received from Lord Bute a lucrative sinecure in 1760. He died on the 21st of April 1765. Mallet was a small man, in his younger days something of a dandy and inordinately vain. He was twice married; by his first wife he had a daughter, Dorothy, who married Pietro

Paolo Celesia, a Genoese gentleman, and was the author of several poems and plays, notably *Almida*, produced by Garrick at Drury Lane in 1771.

Mallet's own works included several plays, some of which were produced by Garrick, who was Mallet's personal friend. *Eurydice*, a tragedy, with prologue and epilogue by Aaron Hill, was produced at Drury Lane in 1731; *Mustapha*, also a tragedy, had considerable success at the same theatre in 1739; in 1740, in collaboration with Thomson, he produced the masque *Alfred*, of which he published a new version in 1751, after Thomson's death, claiming it to be almost entirely his own work. This masque is notable as containing the well-known patriotic song, "Rule Britannia," the authorship of which has been attributed to Mallet, although he allowed it to appear without protest in his lifetime with Thomson's name attached. His other writings include *Poems on Several Occasions* (1743); *Amyntor and Theodora, or the Hermit* (1747); another volume of *Poems* (1762).

In 1759 a collected edition of Mallet's *Works* was published in three volumes; and in 1857 his *Ballads and Songs* were edited by F. Dinsdale with notes, and a biographical memoir of the author.

MALLET, PAUL HENRI (1730-1807), Swiss writer, was born on the 20th of August 1730, in Geneva. After having been educated there, he became tutor in the family of the count of Calenberg in Saxony. In 1752 he was appointed professor of *belles lettres* to the academy at Copenhagen. He was naturally attracted to the study of the ancient literature and history of his adopted country, and in 1755 he published the first fruits of his researches, under the title *Introduction à l'histoire du Danemarck où l'on traite de la religion, des mœurs, des lois, et des usages des anciens Danois*. A second part, more particularly relating to the ancient literature of the country, *Monuments de la mythologie et de la poesie des Celtes, et particulièrement des anciens Scandinaves*, was issued in 1756, and was also translated into Danish. A translation into English, with notes and preface, by Bishop Percy, was issued in 1770 under the title of *Northern Antiquities* (republished with additions in 1847). The book had a wide circulation, and attracted much attention on account of its being the first (though a very defective) translation into French of the *Edda*. The king of Denmark showed his appreciation by choosing Mallet to be preceptor of the crown prince. In 1760 he returned to Geneva, and became professor of history in his native city. While there he was requested by the czarina to undertake the education of the heir-apparent of Russia (afterwards the czar Paul I.), but declined the honour. An invitation more congenial to his tastes led to his accompanying Lord Mountstuart in his travels through Italy and thence to England, where he was presented at court and commissioned to write the history of the house of Brunswick. He had previously received a similar commission from the landgrave of Hesse-Cassel for the preparation of a history of the house of Hesse, and both works were completed in 1785. The quietude of a literary life was rudely broken by the shock of the Revolution, to which he was openly hostile. His leanings to the unpopular side were so obnoxious to his fellow-citizens that he was obliged to quit his native country in 1792, and remained in exile till 1801. He died at Geneva, on the 8th of February 1807.

A memoir of his life and writings, by Sismondi, was published at Geneva in 1807. Besides the *Introduction to the History of Denmark*, his principal works are: *Histoire du Danemarck* (3 vols., Copenhagen, 1758-1777); *Histoire de la maison de Hesse* (4 vols., 1767-1785); *Histoire de la maison de Brunswick* (4 vols., 1767-1785); *Histoire de la maison et des états du Mecklenbourg* (1796); *Histoire des Suisses ou Helvétiens* (4 vols., Geneva, 1803) (mainly an abridgment of J. von Müller's great history); *Histoire de la ligue hanséatique* (1805).

MALLET, ROBERT (1810-1881), Irish engineer, physicist and geologist, was born in Dublin, on the 3rd of June 1810. He was educated at Trinity College in that city, and graduated B.A. in 1830. Trained as an engineer, he was elected M.Inst.C.E. in 1842; he built in 1848-1849 the Fastnet Rock lighthouse, south-west of Cape Clear, and was engaged in other important works. Devoting much attention to pure science, he became especially distinguished for his researches on earthquakes, and from 1852-1858 he was engaged (with his son John William Mallet) in the preparation of his great work, *The Earthquake Catalogue of the British Association* (1858). In 1862 he published two volumes, dealing with the *Great Neapolitan Earthquake of 1857* and *The First Principles of Observational Seismology*. He then brought forward evidence to show that the depth below the earth's surface, whence came the impulse of the Neapolitan earthquake, was about 8 or 9 geographical miles. One of his most important essays was that communicated to the Royal Society (*Phil. Trans.* clxiii. 147; 1874), entitled *Volcanic Energy: an Attempt to develop its True Origin and Cosmical Relations*. He sought to show that volcanic heat may be attributed to the effects of crushing, contortion and other disturbances in the crust of the earth; the disturbances leading to the formation of lines of fracture, more or less vertical, down which water would find its way, and if the temperature generated be sufficient volcanic eruptions of steam or lava would follow. He was elected F.R.S. in 1854, and he was awarded the Wollaston medal by the Geological Society of London in 1877. He died at Clapham, London, on the 5th of November 1881.

MALLET DU PAN, JACQUES (1749-1800), French journalist, of an old Huguenot family, was born near Geneva in 1749, the son of a Protestant minister. He was educated at Geneva, and through the influence of Voltaire obtained a professorship at Cassel. He soon, however, resigned this post, and going to London joined H.S.N. Linguet in the production of his *Annales politiques* (1778-1780). During Linguet's imprisonment in the Bastille Mallet du Pan continued the *Annales* by himself (1781-1783); but Linguet resented this on his release, and Mallet du Pan changed the title of his own publication to *Mémoires historiques* (1783). From 1783 he incorporated this work with the *Mercure de France* in Paris, the political direction of which had been placed in his hands. On the outbreak of the French Revolution he sided with the Royalists, and was sent on a mission (1791-1792) by Louis XVI. to Frankfort to try and secure the sympathy and intervention of the German princes. From Germany he travelled to Switzerland and from Switzerland to Brussels in the Royalist interest. He published a number of anti-revolutionary pamphlets, and a violent attack on Bonaparte and the Directory resulted in his being exiled in 1797 to Berne. In 1798 he came to London, where he founded the *Mercure britannique*. He died at Richmond, Surrey, on the 10th of May 1800, his widow being pensioned by the English government. Mallet du Pan has a place in history as a pioneer of modern political journalism. His son John Lewis Mallet (1775-1861) spent a useful life in the English civil service, becoming secretary of the Board of Audit; and J. L. Mallet's second son, Sir Louis Mallet (1823-1890) also entered the civil service in the Board of Trade and rose to be a distinguished economist and a member of the Council of India.

Mallet du Pan's *Mémoires et correspondance* was edited by A. Sayous (Paris, 1851). See *Mallet du Pan and the French Revolution* (1902), by Bernard Mallet, son of Sir Louis Mallet, author also of a biography of his father (1900).

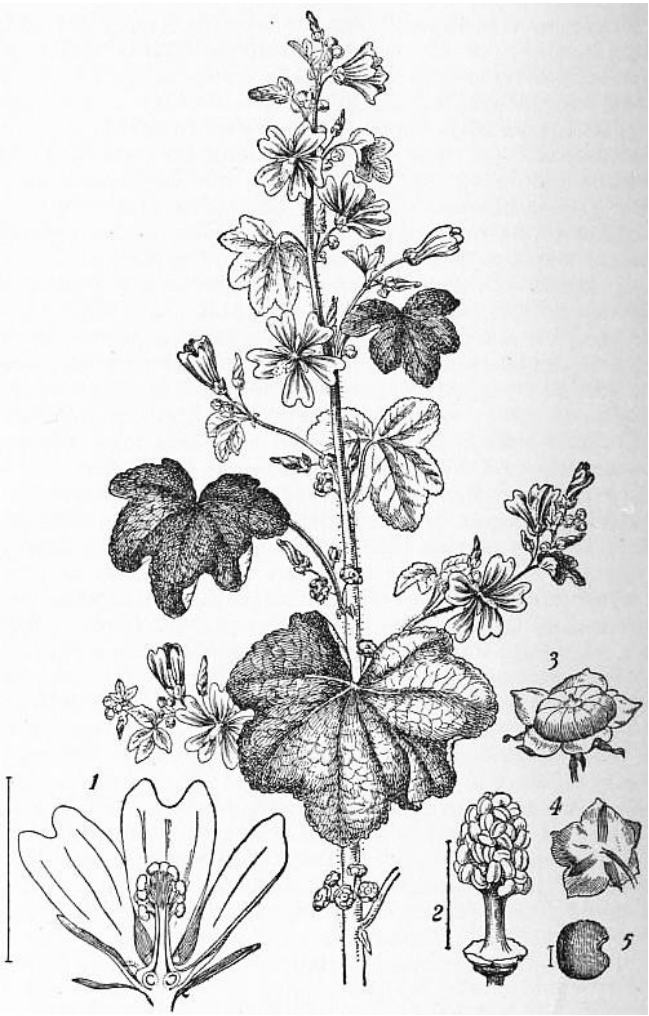
MALLING, EAST and **WEST**, two populous villages in the Medway parliamentary division of Kent, England, respectively 5 and 6 m. W. by N. of Maidstone, with a station on the South-Eastern and Chatham railway. Pop. (1901), East Malling, 2391; West Malling, 2312. They are situated in a rich agricultural district on the western slope of the valley of the Medway, and East Malling has large paper mills. At West Malling are remains of Malling Abbey, a Benedictine nunnery founded in 1090 by Gundulf, bishop of Rochester. The remains, which are partly incorporated in a modern building, include the Norman west front of the church, the Early English cloisters, the chapter-house, gate-house (the chapel of which is restored to use), and other portions. About Addington near West Malling are considerable prehistoric remains, including mounds, single stones, stone circles and pits in the chalk hills; while at Leybourne are the gateway and other fragments of the castle held by the Leybourne family from the 12th to the 14th century.

MALLOCK, WILLIAM HURRELL (1849-), English author, was born at Cockington Court, Devonshire. He was educated privately, and at Balliol College, Oxford. He won the Newdigate prize in 1872, and took a second class in the final classical schools in 1874. He attracted considerable attention by his satirical story *The New Republic* (2 vols., 1877), in which he introduced characters easily recognized as prominent living men, Mark Pattison, Matthew Arnold, W. K. Clifford and others. His keen logic and gift for acute exposition and criticism were displayed in later years both in fiction and in controversial works. In a series of books dealing with religious questions he insisted on dogma as the basis of religion and on the impossibility of founding religion on purely scientific data. In *Is Life Worth Living?* (1879) and *The New Paul and Virginia* (1878) he attacked Positivist theories, and in a volume on the intellectual position of the Church of England, *Doctrine and Doctrinal Disruption* (1900), he advocated the necessity of a strictly defined creed. Later volumes on similar topics were *Religion as a Credible Doctrine* (1903) and *The Reconstruction of Belief* (1905). He published several brilliant works on economics, directed against Radical and Socialist theories: *Social Equality* (1882), *Property and Progress* (1884), *Labour and the Popular Welfare* (1893), *Classes and Masses* (1896) and *Aristocracy and Evolution* (1898); and among his anti-socialist works should be classed his novel, *The Old Order Changes* (1886). His other novels include *A Romance of the Nineteenth Century* (1881), *A Human Document* (1892), *The Heart of Life* (1895) and *The Veil of the Temple* (1904). He published a volume of *Poems* in 1880, and in 1900 *Lucretius on Life and Death* in verse.

MALLOW, a market town and watering place of Co. Cork, Ireland, on the Blackwater, 144½ m. S.W. from Dublin, and 21 N. from Cork by the Great Southern and Western railway. Pop. (1901), 4542. It is a junction for lines westward to Killarney and Co. Kerry, and eastward to Lismore and Co. Waterford. The town

owes its prosperity to its beautiful situation in a fine valley surrounded by mountains, and possesses a tepid mineral spring, considered efficacious in cases of general debility and for scorbutic and consumptive complaints. A spa-house with pump-room and baths was erected in 1828. The parish church dates from 1818, but there are remains of an earlier building adjoining it. There are manufactures of mineral water and condensed milk, corn-mills and tanneries. Mallow received a charter of incorporation from James I. Its name was originally Magh Allo, that is, Plain of the Allo (the old name used by Spenser for this part of the river), and the ford was defended by a castle, built by the Desmonds, the ruins of which remain. A bridge connects the town with the suburb of Ballydaheen. Mallow is a centre for the fine salmon fishing on the Blackwater. The climate is very mild. The town was a parliamentary borough till 1885. It is governed by an urban district council.

MALLOW, botanically *Malva*, the typical genus of the natural order Malvaceae, embracing about sixteen species of annual and perennial herbaceous plants, widely distributed throughout the northern hemisphere. The mallows possess the reniform one-celled anthers which specially characterize the *Malvaceae* (*q.v.*). The petals also are united by their base to the tube formed by the coalesced filaments of the stamens. The special characters which separate the genus *Malva* from others most nearly allied to it are the involucre, consisting of a row of three separate bracts attached to the lower part of the true calyx, and the numerous single-seeded carpels disposed in a circle around a central axis, from which they become detached when ripe. The flowers are mostly white or pinkish, never yellow, the leaves radiate-veined, and more or less lobed or cut. Three species are natives of Britain. The musk mallow (*Malva moschata*) is a perennial herb with five-partite, deeply-cut leaves, and large rose-coloured flowers clustered together at the ends of the branched stems, and is found growing along hedges and borders of fields, blossoming in July and August. It owes its name to a slight musky odour diffused by the plant in warm dry weather when it is kept in a confined situation. The round-leaved dwarf mallow (*Malva rotundifolia*) is a creeping perennial, growing in waste sandy places, with roundish serrate leaves and small pinkish-white flowers produced in the axils of the leaves from June to September. It is common throughout Europe and the north of Africa, extending to western and northern Asia. The common mallow (*Malva sylvestris*), the *mauve* of the French, is an erect biennial or perennial plant with long-stalked roundish-angular serrate leaves, and conspicuous axillary reddish-purple flowers, blossoming from May to September. Like most plants of the order it abounds in mucilage, and hence forms a favourite domestic remedy for colds and sore throats. The aniline dye called mauve derives its name from its resemblance to the colour of this plant.



Mallow (*Malva sylvestris*), ⅓ nat. size.

1. Flower in section.
2. Stamens showing the union of the filaments into a common tube (monadelphous).
3. Fruit with persistent calyx. 1, 2 and 5 enlarged.
4. Same seen from the back showing the 3-leaved epicalyx.
5. Seed.

The marsh mallow (*Althaea officinalis*), the *guimauve* of the French, belongs to another genus having an involucre of numerous bracts. It is a native of marshy ground near the sea or in the neighbourhood of saline springs. It is an erect perennial herb, with somewhat woody stems, velvety, ovate, acute, unequally serrate leaves, and delicate pink showy flowers blooming from July to September. The flowers are said to yield a good deal of honey to bees. The marsh mallow is remarkable for containing asparagin, $C_4H_8N_2O_3$, H_2O, which, if the root be long kept in a damp place, disappears, butyric acid being developed. The root also contains about 25% of starch and the same quantity of mucilage, which differs from that of gum arabic in containing one molecule less of water and in being precipitated by neutral acetate of lead. It is used in *pâte de guimauve* lozenges. *Althaea rosea* is the hollyhock (*q.v.*).

The mallow of Scripture, Job xxx. 4, has been sometimes identified with Jew's mallow (*Corchorus olitorius*), a member of the closely allied order Tiliaceae, but more plausibly (the word מלוח implying a saline plant) with *Atriplex Halimus*, or sea orache. In Syria the *Halimus* was still known by the name *Mallūh* in the time of Ibn Beitar. See Bochart, *Hieroz.* iii. 16.

MALMEDY, a town of Germany, in the Prussian Rhine Province, lying in a wild and deep basin, on the Warche, 20 m. S. of Aix-la-Chapelle by rail via Eupen. It contains two Roman Catholic churches, a modern town-hall and a classical school. Its industries include tanning, dyeing and paper-making. Pop. (1900), 4680. Malmedy was famous for its Benedictine abbey, founded about 675, which was united with that of Stablo, the abbot of the joint house being a prince of the empire. In 1802 the lands of the abbey passed to France, and in 1815 they were divided between Prussia and Netherlands.

See Kellen, *Malmedy und die preussische Wallonie* (Essen, 1897).

MALMESBURY, JAMES HARRIS, 1st Earl of (1746-1820), English diplomatist, was born at Salisbury on the 21st of April 1746, being the son of James Harris (*q.v.*), the author of *Hermes*. Educated at Winchester, Oxford and Leiden, young Harris became secretary in 1768 to the British embassy at Madrid, and was left as *chargé d'affaires* at that court on the departure of Sir James Grey until the arrival of George Pitt, afterwards Lord Rivers. This interval gave him his opportunity; he discovered the intention of Spain to attack the Falkland Islands, and was instrumental in thwarting it by putting on a bold countenance. As a reward he was appointed minister *ad interim* at Madrid, and in January 1772 minister plenipotentiary to the court of Prussia. His success was marked, and in 1777 he was transferred to the court of Russia. At St Petersburg he made his reputation, for he managed to get on with Catherine in spite of her predilections for France, and steered adroitly through the accumulated difficulties of the first Armed Neutrality. He was made a knight of the Bath at the end of 1778, but in 1782 he returned home owing to ill-health, and was appointed by his friend Fox to be minister at the Hague, an appointment confirmed after some delay by Pitt (1784). He did very great service in furthering Pitt's policy of maintaining England's influence on the Continent by the arms of her allies, and held the threads of the diplomacy which ended in the king of Prussia's overthrowing the republican party in Holland, which was inclined to France, and re-establishing the prince of Orange. In recognition of his services he was created Baron Malmesbury of Malmesbury (Sept. 1788), and permitted by the king of Prussia to bear the Prussian eagle on his arms, and by the prince of Orange to use his motto "Je maintiendrai." He returned to England, and took an anxious interest in politics, which ended in his seceding from the Whig party with the duke of Portland in 1793; and in that year he was sent by Pitt, but in vain, to try to keep Prussia true to the first coalition against France. In 1794 he was sent to Brunswick to solicit the hand of the unfortunate Princess Caroline for the prince of Wales, to marry her as proxy, and conduct her to her husband in England. In 1796 and 1797 he was at Paris and Lille vainly negotiating with the French Directory. After 1797 he became partially deaf, and quitted diplomacy altogether; but for his long and eminent services he was in 1800 created earl of Malmesbury, and Viscount Fitzharris, of Heron Court in the county of Hants. He now became a sort of political Nestor, consulted on foreign policy by successive foreign ministers, trusted by men of the most different ideas in political crises, and above all the confidant, and for a short time after Pitt's death almost the political director, of Canning. Younger men were also wont to go to him for advice, and Lord Palmerston particularly, who was his ward, was tenderly attached to him, and owed many of his ideas on foreign policy directly to his teaching. His later years were free from politics, and till his death on the 21st of November 1820 he lived very quietly and almost forgotten. As a statesman, Malmesbury had an influence among his contemporaries which is scarcely to be understood from his writings, but which must have owed much to personal charm of manner and persuasiveness of tongue; as a diplomatist, he seems to have deserved his reputation, and shares with Macartney, Auckland and Whitworth the credit of raising diplomacy from a

profession in which only great nobles won the prizes to a career opening the path of honour to ability. He was succeeded as 2nd earl by his son James Edward (1778-1841), under-secretary for foreign affairs under Canning; from whom the title passed to James Howard, 3rd earl of Malmesbury (*q.v.*).

Malmesbury did not publish anything himself, except an account of the Dutch revolution, and an edition of his father's works, but his important *Diaries* (1844) and *Letters* (1870) were edited by his grandson.

MALMESBURY, JAMES HOWARD HARRIS, 3RD EARL OF (1807-1889), English statesman, son of the 2nd earl, was born on the 25th of March 1807, and educated at Eton and Oriel College, Oxford. He led a life of travel for several years, making acquaintance with famous people; and in 1841 he had only just been elected to the House of Commons as a Conservative, when his father died and he succeeded to the peerage. His political career, though not one which made any permanent impression on history, attracted a good deal of contemporary attention, partly from his being foreign secretary in 1852 and again in 1858-1859 (he was also lord privy seal in 1866-1868 and in 1874-1876), and partly from his influential position as an active Tory of the old school in the House of Lords at a time when Lord Derby and Mr Disraeli were, in their different ways, moulding the Conservatism of the period. Moreover his long life—he survived till the 17th of May 1889—and the publication of his *Memoirs of an Ex-Minister* in 1884, contributed to the reputation he enjoyed. These *Memoirs*, charmingly written, full of anecdote, and containing much interesting material for the history of the time, remain his chief title to remembrance. Lord Malmesbury also edited his grandfather's *Diaries and Correspondence* (1844), and in 1870 published *The First Lord Malmesbury and His Friends: Letters from 1745 to 1820*. He was succeeded as 4th earl by his nephew, Edward James (1842-1899), whose son, James Edward (b. 1872) became the 5th earl in 1899.

MALMESBURY, a market town and municipal borough in the Chippenham parliamentary division of Wiltshire, England, 94½ m. W. of London by the Great Western railway. Pop. (1901), 2854. It lies on a ridge surrounded on all sides except the north-west by the river Avon and a small tributary. The church of St Mary and St Aldhelm, standing high, is a majestic fragment consisting of the greater part of the nave (with aisles) of a Benedictine abbey church. The ruined skeleton of the great tower arches now terminates the building eastward. The nave is transitional Norman, with a Decorated superstructure including the clerestory. The south porch is one of the finest Norman examples extant, both the outer and the inner doorways (especially the first) exhibiting the typical ornament of the period in remarkable exuberance. With the exception of a crypt, the monastic buildings have disappeared. In the market square stands a fine market cross of the 16th century, borne upon an octagonal battlemented basement. Early English fragments of a hospital of St John of Jerusalem appear in the corporation almshouse. Malmesbury has an agricultural trade, with breweries, tanneries and manufactures of silk and pillow lace. It is governed by a mayor, 4 aldermen and 12 councillors. Area, 178 acres.

Maildulphus, a Scottish or Irish monk, who came into England about 635, built a hermitage near the site of the modern Malmesbury (*Maildulphi-urbs*, *Maldelmesburh*, *Malmesbiri*) and gathered disciples round him, thus forming the nucleus of the later abbey of which Aldhelm his pupil became the first abbot. Æthelstan, who was buried here (though his tomb in the church only dates from the 16th century), rebuilt and endowed the monastery. Round the abbey the town of Malmesbury grew up, and by the time of the Domesday Survey it had become one of the only two Wiltshire boroughs. The first charter, said to be a forgery, purports to have been given by Æthelstan. It granted to the burgesses all privileges and free customs such as they held in the time of Edward the Elder, with many additional exemptions, in return for help rendered against the Danes. The castle built at Malmesbury during the reign of Henry I. gave a further impetus to the growth of the town during the 12th and 13th centuries. It was not incorporated, however, until 1645, when it was made a free borough under the title of "aldermen and burgesses of the borough of Malmesbury, County Wilts." By this charter it was governed until 1885. The borough returned two members to parliament from 1295 to 1832 when the number was reduced to one. Finally in 1885 its representation was merged in that of the county. A grant of a yearly fair on the 31st of March, the feast of St Aldhelm, was obtained from William II., and another for three days from the 25th of July from John. In 1792 fairs were held on the 28th of March, the 28th of April and the 29th of June, but in 1891 they had ceased entirely. John also granted a weekly market on Thursday. In the 16th and 18th centuries it was held on Saturday, and in 1891 on the third Wednesday in each month. In the middle ages Malmesbury possessed a considerable cloth manufacture, and at the Dissolution the abbey was bought by a rich clothier and fitted with looms for weaving. The trade in wool still flourished in 1751.

See *Victoria County History: Wiltshire*; and *Registrum malmesburiense* (1879-1880).

MALMÖ, a seaport of Sweden, chief town of the district (*län*) of Malmöhus, on a small bay of the Sound, 384 m. S.S.W. of Stockholm by rail. Pop. (1800), 38,054; (1900), 60,857. It is connected with Copenhagen, 17¼ m. W. by N., by steam-ferry, the Sound being kept open in winter by an ice-breaker. It is also the first important station in Sweden on the Berlin-Stockholm route, which crosses the sea between Sassnitz in Rügen and Trelleborg, 20 m. S.E. of Malmö. The town, which stands upon a level plain, formerly had strong fortifications, of which only the citadel (Malmöhus) remains; in it the earl of Bothwell was imprisoned by Frederick II. of Denmark for some time after his departure from Scotland in 1567. The town-hall (1546, largely restored in 1864) contains a handsome chamber, the Knutssal, formerly used by the council of the gild of Canute. The hall fronts the central square (*Stortorg*) which is planted with trees and contains a colossal statue of Charles X. by Johan Helenus Börjeson (b. 1835) erected in 1896. The most notable church is that of St. Peter (*Peterkyrka*), dating in part from 1319. Malmö is second to Stockholm as an industrial centre. There are breweries and large works for the manufacture of machinery, among which may be mentioned the Kockum mechanical works, with yards for the construction of vessels of war, and others; of cotton and woollen goods, gloves, chocolate, sweetmeats and tobacco. A large export trade is carried on in butter and other agricultural produce, and matches. Coal is the chief import. The harborage includes an outer harbour of 22 ft. depth, and two inner basins admitting vessels of 21 ft. draught, with dry dock and patent slip. Malmö returns four members to the second chamber of the Riksdag (parliament).

Malmö (Malmhauge, Malmey, Malmöye, Malmoughe), sometimes called *Ancona Scanorum* or *Ellenbogen*, first appears in history about the middle of the 13th century. During the Hanseatic period it was the most important commercial town on the Sound, but in the 16th and 17th centuries greatly lost ground owing to the decay of its herring fisheries and the rise of its rival, Copenhagen. Its modern prosperity is largely due to the enterprise of Frans Snell, one of its merchants in the second half of the 18th century, who first constructed the harbour.

MALMSEY, a strong sweet wine, originally made at Monemvasia (Gr. Μονεμβασία), Napoli di Malvasia, in the Morea, Greece. The name of the place was corrupted in Med. Lat. into *malmasia*, whence the English form of the word. The corruption malvasia gives the O. Fr. *malvesie*, from which comes the alternative English form “malvoisie.” The wine is now made not only in Greece but also in Spain, Madeira and the Azores.

MALOCELLO, LANCILOTO (“Lanzarote, the ‘Lancelot Maloisiel’ of the French”), leader of the first of modern European oceanic enterprises. This was a Genoese expedition, which about 1270 seems to have sailed into the Atlantic, re-discovered the “Fortunate Islands” or Canaries, and made something of a conquest and settlement in one of the most northerly isles of this archipelago, still known (after the Italian captain) as Lanzarote. According to a Spanish authority of about 1345, the anonymous Franciscan’s *Conosçimiento de todos los reinos*, “Lancarote” was killed by the Canarian natives; but the castle built by him was standing in 1402-1404, when it was utilized for the storage of grain by the French conquerors under Gadifer de la Salle. To Malocello’s enterprise, moreover, it is probable that Petrarch (born 1304) alludes when he tells how, within the memory of his parents, an armed fleet of Genoese penetrated to the “Fortunatae”; this passage some would refer, without sufficient authority, to the expedition of 1291. Malocello’s name and nationality are certainly preserved by those early *Portolani* or scientific charts (such as the “Dulcert” of 1339 and the “Laurentian Portolano” of 1351), in which the African islands appear, for the first time in history, in clear and recognizable form. Thus Dulcert reads *Insula de Lanzarotus* and *Marocelus*, the Laurentian map *I. de Lanzarote*, against Lanzarote Island, which is well depicted on both designs, and marked with the cross of Genoa. The *Conosçimiento* (as noticed above) explicitly derives the island-name from the Genoese commander who perished here. Malocello’s enterprise not only marks the beginning of the oversea expansion of western Europe in exploration, conquest and colonization (after the age of Scandinavian world-roving had passed); it is also probably not unconnected with the great Genoese venture of 1291 (in search of a waterway to India, which soon follows), with which this attempt at Canarian discovery and dominion has been by some unjustifiably identified.

See the *Conosçimiento*, p. 100, as edited by Marcos Jimenez de la Espada in the *Boletin de la sociedad geográfica de Madrid*, (February 1877); *Le Canarien* in P. Margry, *Conquête des ... Canaries*, p. 177; M. A. P. d’Avezac in vol. vi., part ii., of *L’Univers*, pp. 1-41 (*Îles africaines de l’océan atlantique*); C. R. Beazley, *Dawn of Modern Geography*, iii. 411-413, 449, 451.

MALOLOS, a town and the capital of the province of Bulacán, island of Luzon, Philippine Islands, on a branch of the Pampanga Grande river. Pop. (1903), after the annexation of Barasoain and Santa Isabel, 27,025. There are thirty-eight villages, or barrios, of which eight had, in 1903, 1000 inhabitants or more. The principal language is Tagalog, but Spanish is spoken to some extent. Malolos is served by the Manila & Dagupan railway, and is a trade centre of considerable importance. The cultivation of rice is an important industry. In 1898-99, during the Filipino revolt, Malolos was the seat of the rebel government, but it was captured and reduced to desolation in March 1899. In 1904 a new municipal school building, a municipal market and a provincial building were erected.

MALONE, EDMOND (1741-1812), Irish Shakespearian scholar and editor, was born in Dublin, on the 4th of October 1741, the son of a barrister and a member of the Irish House of Commons. He was educated at Trinity College, Dublin, and was called to the Irish bar in 1767. The death of his father in 1774 assured him a competency, and he went to London, where he frequented literary and artistic circles. He frequently visited Dr Johnson and was of great assistance to Boswell in revising and proofreading his *Life*, four of the later editions of which he annotated. He was intimate with Sir Joshua Reynolds, to whom he sat for a portrait now in the National Portrait Gallery. He was one of Reynolds' executors, and published a posthumous collection of his works (1798) with a memoir. Horace Walpole, Burke, Canning, Lord Charlemont, and, at first, George Steevens, were among Malone's friends. Encouraged by the two last he devoted himself to the study of Shakespearian chronology, and the results of his "Attempt to ascertain the Order in which the Plays of Shakespeare were written" (1778) are still largely accepted. This was followed in 1780 by two supplementary volumes to Steevens's version of Dr Johnson's *Shakespeare*, partly consisting of observations on the history of the Elizabethan stage, and of the text of doubtful plays; and this again, in 1783, by an appendix volume. His refusal to alter some of his notes to Isaac Reed's edition of 1785, which disagreed with Steevens's, resulted in a quarrel with the latter. The next seven years were devoted to Malone's own edition of Shakespeare in eleven volumes, of which his essays on the history of the stage, his biography of Shakespeare, and his attack on the genuineness of the three parts of Henry VI., were especially valuable. His editorial work was lauded by Burke, criticized by Walpole and damned by Joseph Ritson. It certainly showed indefatigable research and proper respect for the text of the earlier editions. Malone published a denial of the claim to antiquity of the Rowley poems (see Chatterton), and in this (1782) as in his branding (1796) of the Ireland MSS. (see Ireland, William Henry) as forgeries, he was among the first to guess and state the truth. His elaborate edition of Dryden's works (1800), with a memoir, was another monument to his industry, accuracy and scholarly care. In 1801 the university of Dublin made him an LL.D. At the time of his death, on the 25th of April 1812, Malone was at work on a new octavo edition of Shakespeare, and he left his material to James Boswell the younger; the result was the edition of 1821—generally known as the Third Variorum edition—in twenty-one volumes. Lord Sunderlin (1738-1816), his elder brother and executor, presented the larger part of Malone's splendid collection of books, including dramatic varieties, to the Bodleian Library, which afterwards bought many of his MS. notes and his literary correspondence. The British Museum also owns some of his letters and his annotated copy of Johnson's *Dictionary*.

A memoir of Malone by James Boswell is included in the *Prolegomena* to the edition of 1821. See also Sir J. Prior's *Life of Edmond Malone* (1860).

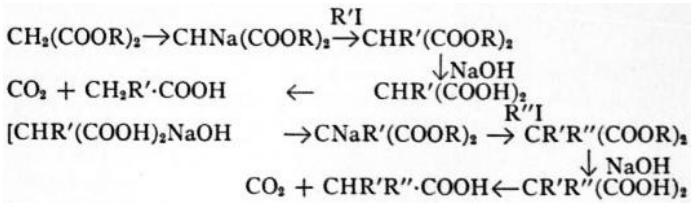
MALONE, a village and the county-seat of Franklin county, in the township of Malone, in the N.E. part of New York, U.S.A., about 60 m. E.N.E. of Ogdensburg. Pop. (1890), 4986; (1900), 5935 (910 foreign-born); (1905, state census), 6478; (1910), 6467. It is served by the New York Central & Hudson River and the Rutland (N.Y. Central Lines) railways. The village has a Memorial Park, Arsenal Green, on the site of an arsenal and parade-ground sold by the state in 1850, a state armoury, the Northern New York Institute for Deaf Mutes, Franklin Academy, St Joseph's Ursuline Academy, and a detention-house for Chinamen entering the state from Canada. From Malone tourists visit the Great North Woods, in the Adirondack foothills, about 15 m. distant. Iron ore and Potsdam sandstone are found near Malone. In the surrounding region hops, potatoes, &c., are grown, and there are dairying and livestock interests. The village is a centre for the collection of hides and pelts. It manufactures woollen goods, paper and pulp, &c., and has foundry and machine shops and car repair shops. Malone, being on the line of communication between lakes Champlain and Ontario, was of strategic importance in the war of 1812, and later was twice the rendezvous of Fenians for attacks on Canada. The township of Malone was settled and erected from Chateaugay in 1805. The village was first known as Harison, was named Ezraville, in honour of Ezra L'Hommedieu, in 1808, received its present name in 1812, and was incorporated in 1853.

MALONIC ACID, $C_3H_4O_4$ or $CH_2(COOH)_2$, occurs in the form of its calcium salt in the sugar beet. It was first prepared in 1858 by V. Dessaignes, who obtained it by oxidizing malic acid (*Ann.*, 1858, 107, p. 251). It may also be obtained by oxidizing allylene and propylene with cold potassium permanganate solution, by the hydrolysis of barbituric acid (malonyl urea) with alkalis (A. Baeyer, *Ann.*, 1864, 130, p. 143); by the hydrolysis of cyanacetic acid (H. Kolbe, *Ann.*, 1864, 131, p. 349; H. Muller, *Ann.*, 1864, 131, p. 352), and by the action of silver oxide on β-di-chloracrylic ester at 125° C. (O. Wallach, *Ann.*, 1878, 193, P. 25)

$$CCl_2{:}CH{\cdot}COOC_2H_5 + Ag_2O + H_2O = 2AgCl + HOOC{\cdot}CH_2{\cdot}COOC_2H_5.$$

It crystallizes in monoclinic tables, and is readily soluble in water, alcohol and ether. The acid melts at 132° C., and at a higher temperature it rapidly decomposes into acetic acid and carbon dioxide. When heated with bromine and water to 100° C. it forms tribromacetic acid, some bromoform being produced at the same time. Malonic acid, as well as its esters, is characterized by the large number of condensation products it can form. In the presence of a dehydrating agent (such as acetic anhydride), it combines with aldehydes to form compounds of the type $R{\cdot}CH{:}C(COOH)_2$, or their decomposition products (formed by loss of CO_2) $R{\cdot}CH{:}CH{\cdot}COOH$.

Many salts of the acid are known and, with the exception of those of the alkali metals, they are difficultly soluble in water. Many esters of malonic acid have been prepared, the most important being the *diethyl ester* (*malonic ester*), $CH_2(COOC_2H_5)_2$, which is obtained by dissolving monochloracetic acid in water, neutralizing the solution with potassium carbonate, and then adding potassium cyanide and warming the mixture until the reaction begins. When the reaction has finished, the whole is evaporated and heated to about 130°-140° C. and then allowed to cool. The mass is then covered with two-thirds of its weight of alcohol, and saturated with hydrochloric acid gas. The whole is then poured into ice-cold water, extracted by ether and the ethereal solution distilled (L. Claisen, *Ann.*, 1883, 218, p. 131). It is a colourless liquid boiling at 197°.7-198°.2 C. (W. H. Perkin). It is a most important synthetic reagent; with sodium or sodium ethylate it forms sodio-malonic ester, which reacts readily with alkyl halides, forming alkyl malonic esters, which are again capable of forming sodium derivatives, that by further treatment with alkyl halides yield the di-alkyl malonic esters. These esters are readily hydrolysed and yield the mono- and di-alkyl malonic acids which, on heating, are readily decomposed, with evolution of carbon dioxide and the formation of mono- and di-alkyl acetic acids. The scheme of reactions is shown thus:



When sodio-malonic ester is heated to 145° C., it undergoes condensation, with elimination of alcohol and formation of the benzene derivative, *phloroglucin tricarboxylic ester*. The addition of urea to an alcoholic solution of sodio-malonic ester results in the formation of barbituric acid (A. Michael, *Jour. pr. Chem.*, 1887 [2], 35, p. 456) The half nitrile of malonic acid is *cyanacetic acid*, $CN{\cdot}CH{\cdot}_2$ COOH, which, in the form of its ester, may be obtained by the action of a solution of potassium cyanide on monochloracetic acid. The solution obtained is neutralized, concentrated on the water-bath, acidified by sulphuric acid and extracted with ether. It is then converted into the lead salt, which is decomposed by sulphuretted hydrogen and the solution is carefully concentrated (Th. Meves, *Ann.*, 1867, 143, p. 201). It melts at 70° C. and at higher temperatures decomposes, with evolution of carbon dioxide and formation of aceto-nitrile, $CH_3{\cdot}CN$. The true nitrile of malonic acid is *methylene cyanide*, $CH_2(CN)_2$, which is obtained by distilling a mixture of cyanacetamide and phosphorus pentoxide. It is a crystalline solid, which melts at 29°-30° C. and boils at 218°-219° C., and is readily soluble in alcohol and ether.

MALORY, SIR THOMAS, translator and compiler of the famous English classic, the *Morte d'Arthur*. Previous to the publication of Professor Kittredge's monograph, *Who was Sir Thomas Malory?* the identity of this writer remained an unsolved problem. Mr. Sidney Lee, in the *Dictionary of National Biography*, was compelled to admit that he could find no one of that name fulfilling the necessary conditions. Of direct evidence we have very little; in the concluding passage of the book the author asks the prayers of the reader for "Syr Thomas Maleore knyght," and states that the book was ended "the ix. yere of the reygne of Kyng Edward the fourth." Caxton, in his preface, says that he printed the book "after a copye unto me delivered whyche copye Syr Thomas Malorye dyd take oute of certeyn bookes of frensshe and reduced it in to Englysshe"; in his colophon he repeats this statement, adding that he himself is responsible for the division of the work into books and chapters, and that it was printed in 1485. It will be noted that Caxton does not say that he received the book from Malory, only that he had received a copy made by Malory; from this Professor Kittredge draws the conclusion that the compiler was no longer living. The problem then is to find a Thomas Malory who was (*a*) a knight, (*b*) alive in the ninth year of King Edward IV. (Mar. 4, 1469-Mar. 3, 1470), and (*c*) who was no longer living in July (or June) 1485.

All these conditions Professor Kittredge finds fulfilled in the life of Sir Thomas Malory, knight, of Newbold Revell (or Fenny Newbold), M.P. for Warwickshire in 1445. The date of Sir Thomas's birth is uncertain, but he

succeeded his father, Sir John, in 1433 or 1434. Previously to this he had served in France, in the retinue of the earl of Warwick, most probably during the time that that nobleman held the office of captain of Calais. It seems probable that he is also to be identified with a "Thomas Malorie, miles," who in 1468 was, on account of the part played by him in the Wars of the Roses, excluded with several others from the operation of a pardon issued by Edward IV. As, however, on the death of Sir Thomas on the 14th of March 1470, there was no difficulty as to inheritance, his estates passing to his grandson, he must, if this identification be correct, have come under the general amnesty of 1469. It will be seen, therefore, that so far as it is in our power to state the question this Sir Thomas Malory fulfils all the necessary conditions.

It is interesting to note that the career of the earl of Warwick in France was marked by certain picturesque and chivalric features which might well impress the imagination of a young retainer. John Rous, in his *Life of Richard Earl of Warwick*, tells us that at a certain tourney held near Calais at Christmastide, Earl Richard appeared three days running in different armour, overthrowing his adversary on each occasion—an exploit obviously imitated from the chivalric romances of the period.

The work with which Malory's name is connected is an abridged compilation of the great body of Arthurian romance in its latest form. The *Merlin* (Vulgate and Suite), *Tristan*, *Lancelot*, *Queste* and *Mort Artus* are all represented, the only branch omitted is that dealing with the "early history" of the Grail, the *Joseph of Arimathea* and *Grand S. Graal*. Thanks mainly to the labours of Dr Oskar Sommer, we can now assign the majority of the books to their separate sources, although certain stories, such as the adventures of Sir Gareth under the pseudonym of Beaumains, the handling of Sir Urre of Hungary, and the details of the abduction of Guenevere by Meleagaunt, still remain unidentified. But we do not yet know whether Malory himself was responsible for this selection, or whether he found it ready to hand in a MS., the "Frensshe Booke" to which he often refers. To make such a compilation at first hand, considering the extent of the ground covered, would involve an enormous amount of study and selection, and the access to a very large library—conditions which scarcely seem to fit in with the social position and activities of Sir Thomas. On the other hand it is undeniable that the medieval copyists, at the instance of their patrons, did make compilations from the various romances within their reach, such as *e.g.* the enormous codex 112 (*fonds Franç.*) of the Bibliothèque Nationale, which includes large sections of the *Tristan*, the *Lancelot*, and the *Merlin* Suite. Taking into consideration alike what Malory retains and what he omits, it seems most probable that he was in possession, not of complete copies of the romances, but of one or more volumes of compilations from these sources.

From the point of view of matter it must be admitted that the *Morte d' Arthur* does not represent the Arthurian cycle at its best, but rather in the period of its decadence; nor does Malory in any way endeavour to overcome the difficulties caused by the juxtaposition of a number of independent (and often contradictory) versions. This is especially noticeable in his treatment of Gawain; in the section derived from the *Lancelot* and *Mort Artus* he is a good and valiant knight, "a ful noble knyghte as ever was borne," in those derived from the *Tristan* and the *Queste*, he is treacherous, dissolute, and a murderer of good knights.

The great charm of Malory's work lies in his style; stately, earnest and dignified, it has lent to the relations between Lancelot and Guenevere a character of truth and vitality in which the French original is wholly lacking. Malory achieved a remarkable feat—he took the Arthurian story in its worst and weakest form and he imparted to it a moral force and elevation which the cycle, even in its earlier and finer stage, had, save in the unique case of Von Eschenbach's *Parzival*, never possessed. While genuine lovers of the Arthurian cycle must regret that the romances should only be known to the great majority of English readers through the versions of Malory and Tennyson, it is impossible to withhold from the *Morte d' Arthur* the admiration due to an imperishable monument of English language and literature.

See *Who was Sir Thomas Malory?* G. L. Kittredge (*Harvard Studies and Notes*, vol. v., 1896); *Morte d' Arthur*, ed. by Dr Oskar Sommer (an exact reproduction of the original text in 2 vols.)—vol. iii. a study on "*The Sources of Malory.*" The sections on *Lancelot* and *Queste* are unfortunately very inadequate; for these cf. *The Legend of Sir Lancelot*, Grimm Library, vol. xii.

(J. L. W.)

MALOT, HECTOR HENRI (1830-1907), French novelist and man of letters, the son of a notary, was born at La Bouille (Seine Inférieure) on the 20th of May 1830. He studied law at Rouen and Paris, but literature early absorbed his attention. He collaborated in the *Biographie générale* of Didot, became literary critic of *L'Opinion Nationale*, and dramatic critic of the *Lloyd français*. He is the author of a long series of popular novels dealing with contemporary life, including: a trilogy of domestic novels entitled *Victimes d'amour* (1859, 1865, 1866); *Un Beau frère* (1869); *Madame Obernin* (1870); *Le Docteur Claude* (1879); *Justice* (1889). *Les Aventures de Romain Kalbris* (1869) and *Sans famille* (1888) are excellent stories for children. A complete edition of Hector Malot's works appeared in 1894-1897. He died at Vincennes in July 1907.

MALOU, JULES ÉDOUARD XAVIER (1810-1886), Belgian statesman, one of the leaders of the clerical party, was born at Ypres on the 19th of October 1810. He was a civil servant in the department of

justice when he was elected to the Chamber of Deputies by his native constituency in 1841, and was for some time governor of the province of Antwerp. He was minister of finance in the coalition ministry of J. B. Nothomb in 1844, and formed with B. T. de Theux a Catholic cabinet in 1846, which was overthrown in the Liberal victory of 1847. Malou then became a member of the senate, and his party only regained ascendancy in 1870. The extreme clerical ministry of Baron d'Anethan retired in December 1871 after serious rioting in Brussels, and Malou was the real, though not the nominal, head of the more moderate clerical administrations of de Theux and Aspremont-Lynden (1870-1878). He was wise enough to disavow the noisy sympathy of Belgian Ultramontane politicians with the German victims of the *Kulturkampf*, and, retaining in his own hands the portfolio of finance, he subordinated his clerical policy to a useful administration in commercial matters, including a development of the railway system. It was only after the fall of the ministry in 1878 that he adopted a frankly clerical policy, and when he became chief of a new government in June 1884 he proceeded to undo the educational compromise of his predecessors in the Frère-Orban ministry. His legislation in favour of the Catholic schools caused rioting in Brussels, and in October the king demanded the retirement of MM. Jacobs and Woeste, the members of the cabinet against whom popular indignation was chiefly directed. Malou followed them into retirement, and died at Woluwe Saint Lambert, in Brabant, on the 11th of July 1886. He was a financier of great knowledge and experience, and his works (of which a long list is given in Koninck's *Bibliographie nationale de Belgique*) include three series (1874-1880) of memoirs on financial questions, edited by him for the Chamber of Deputies, besides pamphlets on railroad proposals, mining and other practical questions. His brother Jean Baptiste Malou (1809-1864) was a well-known divine.

MALOUET, PIERRE VICTOR,, Baron (1740-1814), French publicist and politician, was born at Riom (Puy-de-Dôme) on the 11th of February 1740, the son of a lawyer. He entered the civil service and was employed successively at the French embassy in Lisbon, in the administrative department of the duc de Broglie's army, as commissary in San Domingo from 1767-1774, and, after his return to France, as commissary-general of the marine. In 1776 he was entrusted to carry out plans of colonization in French Guiana, but was superseded in 1779. On his return to France he was well received at court, and the execution of his plans in Guiana was assured. He became intendant of the port of Toulon, and in 1789 was returned to the states-general, where he soon became well known as a defender of the monarchical principle. He emigrated to England in September, 1792, but shortly afterwards sought in vain permission to return to assist in the defence of Louis XVI. His name was erased from the list of emigrants in 1801 by Napoleon, who restored him to his position in the service and sent him to Antwerp as commissioner-general and maritime prefect to superintend the erection of defence works, and the creation of a fleet. He entered the council of state in 1810, but, having offended the emperor by his plainness of speech, he was disgraced in 1812. At the Restoration, Louis XVIII. made him minister of marine; and he died on the 7th of September 1814.

The most important documents for his domestic and colonial policy are a *Collection de ses opinions à l'Assemblée Nationale* (3 vols., 1791-1792); and *Collection de mémoires et correspondances officielles sur l'administration des colonies et notamment sur la Guiane française et hollandaise* (5 vols., 1802).

MALPIGHI, MARCELLO (1628-1694), Italian physiologist, was born at Crevalcuore near Bologna, on the 10th of March 1628. At the age of seventeen he began the study of philosophy; it appears that he was also in the habit of amusing himself with the microscope. In 1649 he started to study medicine; after four years at Bologna he graduated there as doctor. He at once applied to be admitted to lecture in the university, but it was not till after three years (1656) that his request was granted. A few months later he was appointed to the chair of theoretical medicine at Pisa, where he enjoyed the friendship and countenance of G. A. Borelli. At the end of four years he left Pisa, on the ground of ill-health, and returned to Bologna. A call to be professor primarius at Messina (procured for him through Borelli, who had in the meantime become professor there) induced him to leave Bologna in 1662. His engagement at Messina was for a term of four years, at an annual stipend of 1000 scudi. An attempt was made to retain him at Messina beyond that period, but his services were secured for his native university, and he spent the next twenty-five years there. In 1691, being then in his sixty-fourth year, and in failing health, he removed to Rome to become private physician to Pope Innocent XII., and he died there of apoplexy three years later, on the 30th of November 1694. Shortly before his death, he drew up a long account of his academical and scientific labours, correspondence and controversies, and committed it to the charge of the Royal Society of London, a body with which he had been in intimate relations for more than twenty years. The autobiography, along with some other posthumous writings, was published in London in 1696, at the cost of the Society. The personal details left by Malpighi are few and dry. His narrative is mainly occupied with a summary of his scientific contributions and an account of his relations to contemporary anatomists, and is entirely without graces of style or elements of ordinary human interest.

Malpighi was one of the first to apply the microscope to the study of animal and vegetable structure; and his discoveries were so important that he may be considered to be the founder of microscopic anatomy. It was his practice to open animals alive, and some of his most striking discoveries were made in those circumstances. Although Harvey had correctly inferred the existence of the capillary circulation, he had never seen it; it was reserved for Malpighi in 1661 (four years after Harvey's death) to see for the first time the marvellous

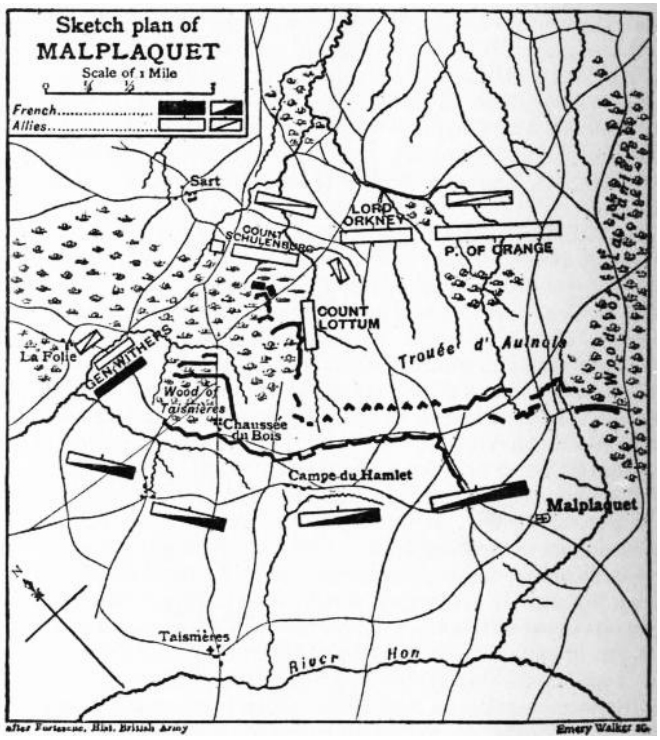
spectacle of the blood coursing through a network of small tubes on the surface of the lung and of the distended urinary bladder of the frog. We are enabled to measure the difficulties of microscopic observation at the time by the fact that it took Malpighi four years longer to reach a clear understanding of the corpuscles in the frog's blood, although they are the parts of the blood by which its movement in the capillaries is made visible. His discovery of the capillary circulation was given to the world in the form of two letters *De Pulmonibus*, addressed to Borelli, published at Bologna in 1661 and reprinted at Leiden and other places in the years following; these letters contained also the first account of the vesicular structure of the human lung, and they made a theory of respiration for the first time possible. The achievement that comes next both in importance and in order of time was a demonstration of the plan of structure of secreting glands; against the current opinion (revived by F. Ruysch forty years later) that the glandular structure was essentially that of a closed vascular coil from which the secretion exuded, he maintained that the secretion was formed in terminal acini standing in open communication with the ducts. The name of Malpighi is still associated with his discovery of the soft or mucous character of the lower stratum of the epidermis, of the vascular coils in the cortex of the kidney, and of the follicular bodies in the spleen. He was the first to attempt the finer anatomy of the brain, and his descriptions of the distribution of grey matter and of the fibre-tracts in the cord, with their extensions to the cerebrum and cerebellum, are distinguished by accuracy; but his microscopic study of the grey matter conducted him to the opinion that it was of glandular structure and that it secreted the "vital spirits." At an early period he applied himself to vegetable histology as an introduction to the more difficult study of the animal tissues, and he was acquainted with the spiral vessels of plants in 1662. It was not till 1671 that he wrote his *Anatome plantarum* and sent it to the Royal Society, who published it in the following year. An English work under a similar title (*Anatomy of Vegetables*) had been published in London a few months earlier, by Nehemiah Grew; so that Malpighi's priority as a vegetable histologist is not so incontestable as it is in animal histology. The *Anatome plantarum* contained an appendix, *Observations de ovo incubato*, which gave an account (with good plates) of the development of the chick (especially of the later stages) in many points more complete than that of Harvey, although the observations were needlessly lessened in value by being joined to the metaphysical notion of "praedelineation" in the undeveloped ovum.

He also wrote *Epistolae anatomicae Marc. Malpighii et Car. Fracassati* (Amsterdam, 1662) (on the tongue, brain, skin, omentum, &c.); *De viscerum structura: exercitatio anatomica* (London, 1669); *De structura glandularum conglobatarum* (London, 1689); *Opera posthuma, et vita a seipso scripta* (London, 1697; another edition, with preface and additions, was published at Amsterdam in 1700.). An edition containing all his works except the last two was published in London in 1687, in 2 vols. folio, with portrait and plates.

MALPLAQUET, a village of France in the department of the Nord, close to the Belgian frontier and about 10 miles S. by E. of Mons, famous as the scene of the battle, September 1709, between the Allies under the duke of Marlborough and Prince Eugène and the French commanded by Marshal Villars, in which the former were victorious. The country to the west and south of Mons is enclosed by a semicircular wall of woods and broken ground, through which there are only two important gaps—that of Jemappes (famous in 1792) to the west, and that of Aulnois, in which stands the village of Malplaquet, to the south. In the latter gap and the woods on either side Villars took up his position facing north-eastwards, on August 29/September 9. The forces in presence, over 90,000 on each side, were exceptionally large, and the French army in particular represented the spirit of its nation to a degree unusual in the armies of that time. Villars was the best general in the service of Louis XIV. and the veteran Marshal Boufflers, though senior to him, had volunteered to serve as his second in command. Marlborough and Eugène lay with their army between Mons and the French camps, which were almost within cannon shot. Marlborough's own wish was for an immediate battle, but he was opposed by the Dutch deputies at his headquarters, and even by Eugène, so that it was only on August 31/September 11 that the attack actually took place. Villars had made full use of his respite. The French right stood at the fringe of the wood of Lanière, the left was strongly posted in the midst of the wood of Taisnière, and across the two and a half miles of open ground between the woods the position was entrenched with several successive lines of works. The troops were almost equally distributed along the whole line as usual, and the cavalry was massed in rear of the infantry. In the Allied army the mounted troops were also kept back, but for the most part distributed to the various infantry commands.

The intention of Marlborough and Eugène, when on the morning of the battle they examined this formidable position, was to deliver the main attack upon the French left wing, combining the assaults of several columns on its front and flanks. In this quarter the French not only held the interior of the wood but also were thrown forward so as to occupy the edges of its north-eastern salient, and upon the two faces of this salient Count Lottum (1650-1719) with the Prussians, and Count von der Schulenburg (1661-1747) with the Austrian infantry were to deliver a double attack, while farther to the Allied right a column under the English General Withers was detached to make a wide turning movement through the woods. Marlborough took command on the right, Eugène on the left. The centre, which was intended only to observe the enemy until the decision had been forced at the wood of Taisnière, consisted of Lord Orkney's British corps and the prince of Orange's Dutch contingent. These extended across the Trouée d'Aulnois as soon as the combined attack of Lottum and Schulenburg opened. The general advance was covered by a heavy cannonade, and the salient of the Taisnière wood was duly attacked on its two faces by the Prussians and Austrians about 9 a.m. They encountered a sterner resistance than in any of the battles and combats of the past seven campaigns, for on this field the defenders were fighting, not as hitherto for the interests of their king, but to defend their country, and the regiments of Picardie and Champagne which held the salient were the oldest and most famous of the French line. Lottum attacked the works on the eastern edge, again and again without success, until three British battalions had to be sent to reinforce him, and Marlborough placed himself with a corps of cavalry in close support. At last the entrenchments were stormed. Schulenburg, with the Austrians, had by this time fought his way through the woods and undergrowth, and the united force pressed back the French farther and farther

into the wood. Still, so stubborn was the defence and so dense the wood that the impetus of the assault died away and the troops on both sides broke up into small disconnected bodies, fighting too fiercely to be amenable to superior control.



After Hon. J. W. Fortescue, *History of the British Army*, by permission of Macmillan & Co., Ltd.

But the French were not reinforced from their right wing as Villars expected. The prince of Orange, far from merely observing the hostile right as he had been ordered to do, committed his corps, very early in the battle, to a serious assault upon it, which Boufflers repulsed with enormous loss. The Dutch infantry never recovered from its casualties on this day, and the memory of Malplaquet was strong even at Fontenoy nearly forty years afterwards. Some Hanoverian troops which took part in this futile attack suffered equally heavily. The only advantage to the Allies—an advantage which, as it happened, counted for much—was that Boufflers did not dare to send reinforcements to the hard-pressed left wing. Thanks to this the Austrians and Prussians, with the English detached to their aid, made steady progress in the wood of Taisnière. Villars launched the “Irish brigade” to check the advance of the Allies, and this famous corps charged into the forest. Villars, Eugène and Marlborough personally led their troops in the encounter which followed. Eugène was wounded, but refused to quit the field. Villars was more seriously hurt, and after trying in vain to direct the fighting from a chair was carried insensible from the field. At this crisis General Withers, who commanded the force that had been ordered to turn the French extreme left, and had fought his way through the forest, appeared on the scene. The British 18th regiment (Royal Irish), encountering the French *Royal Irlandais*, put it to the rout, and Villars’s counterstroke was at an end. The French maintained themselves on this side only by the aid of troops drawn from the centre and right, and this gave the Allied centre the opportunity which the prince of Orange had so rashly anticipated. The great attack over the open was carried out, in spite of the previous repulse, with the greatest determination. Preceded by forty guns, the corps of the prince of Orange and Lord Orkney swiftly carried the first line of works. The Allied cavalry then pushed out to the front, and horse, foot and artillery were combined in the last advance. Boufflers’s cavalry masses, coming into play for the first time, fought hard, and the struggle fluctuated with the arrival of successive reserves on either side, but in the end, shortly before 3 p.m., Boufflers (who had been in command since Villars’s fall) decided to retreat. The Allies had no troops left intact for the pursuit, and those engaged had expended their last efforts. Moreover Boufflers, experienced soldier as he was, drew off his men before they had lost their order and discipline.

Thus this “very murdering battle” as Marlborough called it—the last and greatest pitched battle of the war— 499
was almost barren of results. The Allies lost not less than twenty thousand men, or nearly a quarter of the whole force, the thirty battalions of the Dutch infantry losing half their numbers. On the French side there were some twelve thousand casualties. If further evidence were necessary to prove that the French fought their hardest, it could be found in the fact that whereas in almost every other battle, from 1660 to 1792, there were deserters and prisoners by the thousand, at Malplaquet only 500 of the French fell into the hands of the victors unwounded.

MALSTATT-BURBACH, a town of Germany, in the Prussian Rhine province on the right bank of the Saar (Sarre), which separates it from Saarbrücken. Pop. (1900), 31,195. It lies in the midst of an important coal-mining and industrial district, and is itself little more than a long and narrow row of manufactories and workmen’s houses. The largest factories are engaged in the production of iron, steel and cement. There is a large wharf on the river for the export of coal.

Malstatt received municipal rights in 1321. These, however, were afterwards resigned to the newer town of Saarbrücken, and in 1818 Malstatt and Burbach were two small villages with a joint population of only about 800. About the middle of the century the population began to increase rapidly, in consequence of the development of the mining industry of the district and the extension of the railway system, and in 1874 the two villages were united to form a town.

MALT (O. Eng., *mealt*; O. Sax., *malt*; O. Teut., *maltos*; Mod. Ger., *Malz*; Scand., *malt*; probably derived from the Sanskrit *mrdu*, soft, thus having reference to the fact that malt is raw grain rendered soft or tender), the name given to grain in which germination has been caused to proceed to a certain stage and has then been arrested by the removal of water and the application of heat. During this limited germination enzymes are developed (see FERMENTATION), and the constituents of the grain modified so that the finished malt, when ground and submitted to the mashing process (see BREWING), differs from the original raw grain in that the greater portion dissolves. This solubility is, however, a direct one to a slight extent only; it is due for the most part to the action of the malt enzymes, diastase, &c. on the constituents of the grain, the main portion of which are of themselves insoluble. Thus starch, the main constituent of all graminaceous seeds, probably exists in the same condition in raw grain and in malt. When however the malt is mashed, the starch is attacked by the enzyme diastase, and converted by the process of hydrolysis into a mixture of soluble compounds, *e.g.* the crystalline sugar, maltose, and a number of gummy substances known as maltodextrins. But to a certain extent starch and other carbohydrate substances are rendered directly soluble and diffusible during the malting process, some of the products serving the respiratory needs of the growing germ, others being assimilated by the plantlet and reconverted into reserve carbohydrates in the tissues of the germ and rootlets, whilst the remaining portions are retained as such in the finished malt. Similarly certain of the nitrogenous constituents of the grain, the proteïns, are broken down and rendered soluble by proteolytic enzymes, the products being assimilated to a certain extent by the germ and rootlets, by the cells of which they are again built up into complex proteïns, whilst others remain in their simplified form. It is now known that proteolytic enzymes exist in finished malt, and that, when the mashing process is conducted under certain conditions, these are able to degrade and render soluble some of the higher proteïns present in the malt. When germination is allowed to proceed as it does when the grain is planted in the soil, the whole of the contents are rendered soluble by degrees and in turn assimilated by the growing plantlet. By the limited germination which constitutes the malting process, however, the balance of soluble compounds left in the finished malt is from 15 to 25% of the total weight of the corn.

Although other seeds of the natural order Gramineae are occasionally malted, the greater portion of malt is made from the various species of *Hordeum*, known by the name of barley (*q.v.*), bigg, or bere. Indeed ordinary beer derives its characteristic flavour to the greatest extent from barley malt. A small proportion of malted oats or malted wheat is sometimes used in conjunction with barley malt for certain kinds of beer, whilst rye, maize, and even rice are occasionally malted. Barley is, however, the grain best adapted for making malt intended for brewing beer, and accordingly some space will be devoted to a description of those varieties of this grain which are used by the brewer.

Barley belongs to the genus Hordeum, of which there are numerous species and varieties. Linnaeus and the earlier botanists recognized six species of cultivated barleys, but modern botanists usually consider all cultivated barleys as belonging to one species to which the name *H. sativum* has been given. Körnicke regards *H. spontaneum*, a very long thin-grained two-rowed barley (see below) which grows in the East, as being the parent form; but E. S. Beaven inclines to the view that wild species of more than one form were originally used as food and subsequently cultivated. The last-named author has drawn up a scheme of classification for the varieties and races of cultivated barleys.

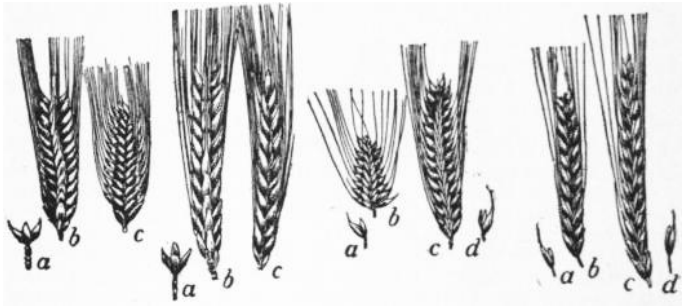


FIG. 1. FIG. 2. FIG. 3. FIG. 4.

Six-rowed barleys.	FIG. 1.—*H. hexastichum.* *a*. Three spikelets *in situ* on the rachis, showing short internodes. *b*. Spike. Median spikelets uppermost, and with lower awns removed. *c*. Spike. Lateral spikelets uppermost, and with lower awns removed. FIG. 2.—*H. vulgare.* *a*. Three spikelets *in situ* on the rachis, showing long internodes. *b*. Spike. Median spikelets uppermost. *c*. Spike. Lateral spikelets uppermost.
	FIG. 3.—*H. zeocriton.*

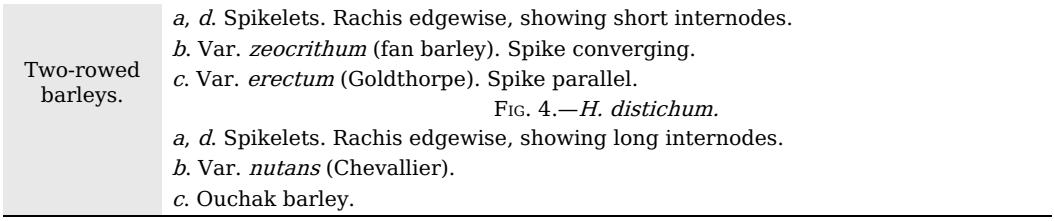


FIG. 4.—*H. distichum.*

Figures 1-4 redrawn from a paper by E. S. Beaven in *Journ. Fed. Inst. Brewing* (1902), 8. 542.

In an ear of barley the primary axis or rachis is divided into internodes of which there may be any number up to forty. Each internode bears three single-flowered spikelets arranged alternately on either side of the rachis. In the six-rowed varieties the whole of these spikelets attain maturity, whilst in the two-rowed varieties only one on each side of the rachis, viz. the median, develops. British beer is brewed principally from the malt made from home-grown two-rowed barleys. Of late years, however, it has been found advantageous to employ a proportion of malt made from the thinner and more husky foreign barleys, mostly six-rowed varieties. The corns of two-rowed barleys are as a rule plumper than those of six-rowed barleys.

The most favourite barley for malting purposes grown in the United Kingdom is the narrow-eared two-rowed *H. distichum*, commonly known as Chevallier, from the name of the original cultivator, the Rev. John Chevallier. Of late years the quantity of barley of the so-called Goldthorpe type (*H. zeocriton*), used for malting, has increased. The paleae or outer coverings of the corns of this variety are somewhat “greasy” in appearance, and do not adhere so closely to the corn as in the Chevallier. The corns of Goldthorpe barley possess a small dimple or transverse furrow near the basal end. Further the basal bristle or rachilla (the prolongation of the axis or point from which the corn was originally developed) is invariably covered with long hairs, whilst in the case of Chevallier it has generally very short hairs. In the variety of Chevallier known as Archer, however, the rachilla has somewhat long hairs. Further the corns of Chevallier barley lie nearly vertical, that is almost parallel to the rachis, whereas in Goldthorpe they are spread out at a greater angle, hence the name fan or peacock barley given to that variety commonly known as sprat. It is believed by some brewers that Goldthorpe barleys never yield malt of so high a quality as do Chevallier barleys. On the other hand, when well matured, Goldthorpes work evenly and freely on the malting floors; and from an agricultural point of view they have the advantage of standing up better against unfavourable weather conditions on account of their stouter straws. Numerous fresh varieties of barley are continually being introduced as a result of artificial cross-fertilization, but cross-fertilization rarely if ever occurs naturally.

Hungarian two-rowed barleys are excellent as regards quality, and command a high price. The so-called Californian Chevallier and Chilean Chevallier contain a certain admixture of the six-rowed *H. vulgare*.

Of the imported thin barleys may be mentioned Brewing Californian, Brewing Chilean, Danubian and Smyrna (Yerli), all for the most part six-rowed varieties; also Ouchak, consisting principally of a two-rowed variety. For the manufacture of grain spirit a malt of high diastatic activity is required, and this is largely made from a very thin barley shipped from Odessa.

In the common six-rowed English barley or Scottish bere (*H. vulgare*), the two lateral rows of spikelets springing from one side of the rachis, either partially or entirely intersect and overlap the alternate lateral spikelets which spring from the opposite side of the rachis. This has given rise to the term “four-rowed barley.” Figs. 1-4 show some typical barleys in the ear.

The production of new varieties by cross-fertilization has of late years attained a degree of almost mathematical precision by the application of the law of inheritance first discovered by Gregor Mendel in 1865, and brought to light in 1901 independently by de Vries, Correns and Tschermak.

Constitution of Barley.—A grain of barley is shuttle-shaped; the end containing the germ which was originally attached to the rachis is known as the proximal end, whilst the opposite end of the corn is called the distal end. A deep furrow runs down the more convex side, which is accordingly denoted the ventral side, the opposite side being distinguished as the dorsal side. Within the ventral furrow at the proximal end is the rachilla already referred to. The skin or husk of a barleycorn consists of two paleae, one adhering to the dorsal side (the palea inferior) and the other to the ventral side (the palea superior); the former overlaps the edges of the latter. The awn or beard is merely an elongation of the palea inferior. If the two paleae are removed from a barleycorn after soaking it in water, it will be seen that there are other skins completely enveloping the embryo and endosperm. These are the true skins, and are known as the pericarp and the testa respectively. It may here be mentioned that A. J. Brown has shown recently that the embryo and endosperm of a barleycorn are enclosed in a semi-permeable membrane, *i.e.* one which allows the passage of water to the interior of the corn, but not of certain salts and acids. This property appears to be associated with one of the layers of the testa. Next to these skins will be seen the triple layer of thick-walled square-shaped aleurone cells.

The histology of the barleycorn is best studied by the examination of sections under the microscope. The grain consists of two main portions, the embryo or germ, and the endosperm, the storehouse of reserve materials for the growing plant.

The accompanying illustrations show portions of longitudinal sections of a barleycorn magnified to different degrees.

On examining fig. 5, which represents a section of the germ end of a grain of barley cut through the ventral furrow, it will be noticed that the rudimentary leaves, stem and roots are distinguishable. The embryo lies embedded in a mass of cells, the part dividing it from the endosperm being known as the scutellum. Special note should be taken of the elongated cells known as the absorptive epithelial layer, which has certain very important functions to fulfil during the process of germination, notably in feeding the embryo when it begins to develop into a young plant. Next to this, actually between the scutellum and the endosperm, will be seen a layer of empty cells. These at one time in the history and the development of the corn contained starch granules, but this starch was absorbed during its later development by the embryo. It will be observed further that the endosperm is filled with a network of thin-walled cells closely packed with starch granules, and

smaller granules of proteïn matter (fig. 6). Nearest the skin will be seen the triple layer of aleurone cells already referred to (fig. 7).

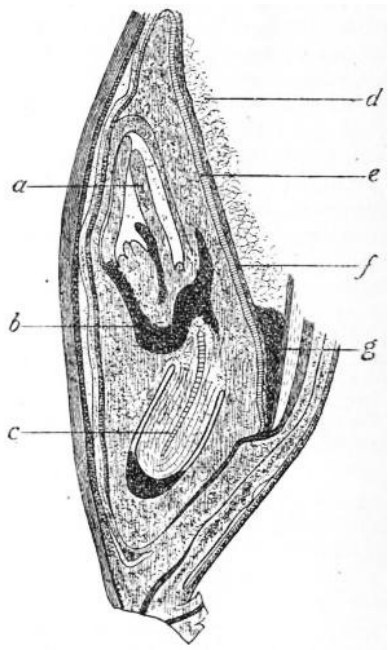


FIG. 5.—Median longitudinal section of a barleycorn showing the germ and its appendages.

a, Rudimentary leaves or plumules;
b, Rudimentary stem;
c, Rudimentary root;
d, Empty starch cells of the endosperm;
e, Absorptive epithelial layer;
f, Compressed layer of empty cells;
g, Starch cells (filled).

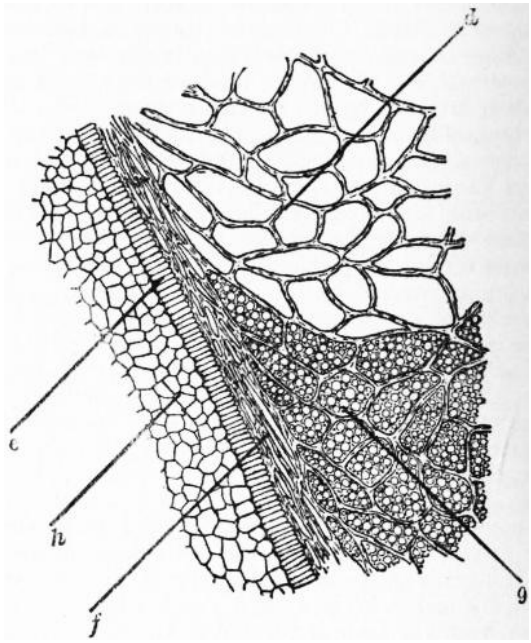


FIG. 6.—Section showing absorptive epithelial layer more highly magnified.

d, Walls of starch cells;
e, Epithelial layer;
f, Compressed layer of empty cells;
g, Cells filled with starch granules;
h, Cells of the scutellum.

Germination.—The barleycorn in its resting stage is in a state which may be described as one of dormant vitality; it respires very slowly and thus loses weight during storage. The best and driest barleys are said to lose 1.3% of their weight in the first year, 0.9% in the second, and 0.5% in the third. The loss is considerably more with coarse and damp samples. When the grain is steeped this dormant vitality gives place to that complicated series of processes comprised under the general term germination. When germination begins, enzymes are secreted, and these act on the reserve materials, starch and proteïns of the endosperm,

converting them into simpler compounds, capable of diffusing to various parts of the growing germ. Following this, starch and proteïns are re-formed, the former being deposited in the tissues of the germ and in the cells of the scutellum, which previously were almost free from starch; the proteïn matter deposited in the latter disappears to a considerable extent, and the protoplasmic content of the cells assumes a very granular appearance. The pointed mass of cells constituting the root-sheath is pushed forward by the root which protrudes through the base of the grain. It is at this stage that the barley is said by the maltster to “chit.” After the first rootlet has broken through the ends of the sheath, it is followed by others. The cotyledonary sheath begins to elongate on the third or fourth day of germination and ruptures the true covering of the seed; it then grows upwards between this and the husk and forms the acrospire or “spire” of the maltster.

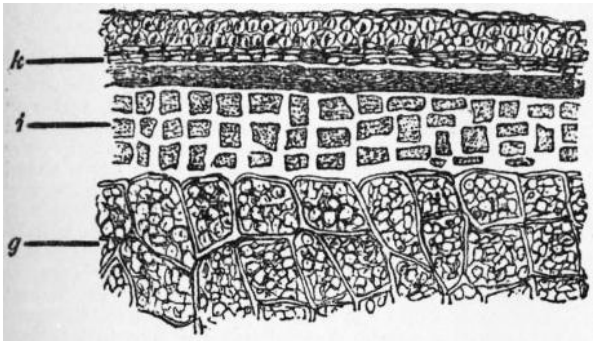


FIG. 7.—Section showing the aleurone layer.

g, Starch cells;
i, Aleurone layer;
k, Layers which collectively constitute the husk.

[Figs. 5-7 from Sykes & Ling, *Principles and Practice of Brewing* (1907), Charles Griffin & Co., Ltd.]

According to Brown and Morris, when the first rootlet is breaking through the sheath, starch begins to appear in the tissues of the grain, also in the protoplasm of those cells which are nearest the epithelial layer, and it gradually invades the deeper-seated cells. Further the cellulose walls of the endosperm, situated immediately above the secretory layer, are partially dissolved, the dissolved matter passing into the scutellum, there to be transformed into starch. Brown and Morris state that this process gradually extends to the cellulose walls of the endosperm, and until these are affected there is no evidence of any solvent action on the starch granules themselves. Thus according to these authors the first enzyme to be formed is one which dissolves cell walls, and it was consequently termed by them a “cytohydrolyst.” They assert further that the so-called mealy or modified condition, which the maltster desires to bring about to the fullest degree, depends on the extent to which the cell walls have been affected, and they enter into a minute description of the entire disappearance of these during the malting process. On the other hand, J. Grüss has pointed out that the action which takes place on the cell walls of the endosperm during germination does not consist in their complete solution. Schulze has shown that these cell walls consist of two carbohydrates, an araban and a xylan. Grüss states that the araban is completely dissolved, whilst the xylan is more or less unattacked. The cell walls become, however, transparent so that they can only be seen in sections which have been stained; Brown and Morris examined unstained sections. The writer (A. R. Ling) has proved that the cell wall is present in the most friable and well modified finished malt.

Condition.—Barley is bought in the open market solely on the evidence of certain external signs, and judgment can only be acquired by long experience. The corns should be plump, even in size, and the colour should be uniform from end to end. The sample should have a sweet odour, and it should be dry to the touch. The presence of light or weevilled corns may be detected by the fact that they float in water. Careless threshing or dressing is responsible for much damage done to barley. In this way many of the corns may be broken, have the palcae partly stripped off or portions removed along with the awn. All broken and dead corns are prone to become mouldy on the malting floors, the contagion thus presented becoming general. E. R. Moritz drew attention in 1895 to the ill effects of close dressing, and more recently (1905) the matter has been brought before the Highland and Agricultural Society, chiefly through Montagu Baird, who with C. H. Babington was instrumental in inducing the Board of Agriculture to publish a leaflet recommending more careful methods of threshing barley. Close dressing was at one time practised as a means of raising the bushel weight, and thus giving a fictitious value to the barley. Immature barley feels cold to the hand, has a greenish-yellow colour, and, when dry, a starved wrinkled appearance. Over-ripeness in barley is distinguished by a white dead appearance of the corn. Mature or dry grains slip through the fingers more readily than unripe or damp ones. The contents of the endosperm should present a white friable or mealy appearance when the corns are bitten or cut in two with a penknife. The condition of the grain may be determined by means of a mechanical cutter, which cuts a certain number of corns (fifty or more) at one time. Some cutters are constructed to cut the corns transversely, others to cut them longitudinally. The so-called transparency test may be used for the same purpose. It is carried out in an apparatus known as the diaphanoscope, which consists of a box fitted with a sliding tray, furnished with a certain number of shuttle-shaped holes (usually 500), each of such a size as just to hold a barleycorn longitudinally. Into the portion of the box below this tray an electric lamp is placed, and the corns are looked at from above. Thoroughly mealy corns are opaque, whilst steely corns are transparent. When certain portions of a corn are steely, these present the appearance of lakes. By this means the percentage of mealy, steely, or half steely corns in a sample may readily be estimated.

E. Prior points out that steeliness of barley is of two kinds, one of which disappears after the grain has been steeped and dried, and therefore does not necessarily influence the malting value of the sample, and the other which is permanent, and therefore retards the modification of the corn. He proposed to determine what he called the coefficient of mellowness of a sample of barley by means of the formula:—

$$(M_1 - M)\ 100$$

$$A = \frac{M_1 - M}{100 - M} + M,$$

in which A is the degree of mellowness, M is the percentage of mealy corns in the original barley, and M_1 is the percentage of mealy corns after steeping and drying the barley. Prior points out that, generally speaking, the degree of mellowness varies inversely as the proteïn content.

The physical differences between steely and mealy grains were first investigated by Johansen, who arrived at the conclusion that mealiness is always accompanied by the presence of air spaces in the endosperm. Munro and Beaven confirmed and extended this. Their conclusions are as follow: "Mealy grains have a lower specific gravity than steely grains, and contain a larger amount of interstitial air. The total nitrogen content of mealy grains is less than that of steely grains. Steely grains contain a relatively high proportion of nitrogenous substances soluble (*a*) in 5% salt solution, and (*b*) in alcohol of specific gravity 0.9. Mealy barley modifies better than steely during germination. The process of drying damp and under-matured barley intact at 100° F. produced an apparent mellowing or maturation. Other things being equal, maturation, which is physiologically a post-ripening process, is correlated with the mealy appearance of the endosperm." H. T. Brown and his collaborators point out that thin sections of steely corns when examined under the microscope no longer exhibit a translucent appearance, but show the mealy properties as completely as if they had been cut from a mealy grain, and they suggest that in a steely corn the whole of the endosperm is under a state of tensile stress which cannot be maintained in the thin sections. If, however, a thin section of a steely barley be cemented to a slide with Canada balsam and then pared away with a razor, steeliness and translucency may be preserved even in the thinnest sections. The mealy appearance in the endosperm of barley is assumed to be a direct consequence of the formation of interspaces around the cell-contents and within the cell walls. Under ordinary conditions it is conjectured that these interspaces are filled with air, but it is pointed out that they can also be produced under circumstances which suggest that they are at times vacuous or partly so. According to the last-mentioned authors they appear to originate from a system of stresses and strains induced within the endosperm by its gradual loss of water, a break of continuity taking place which gives rise to these interspaces when the cohesive power of the heterogeneous cell-contents falls below a certain point. It is further suggested by them that the most important factor in producing the stresses and strains is probably the shrinkage of the starch granules as their water content is reduced from, say, 40 to about 15%. It is pointed out, however, that actual discontinuity in the cell-contents can only take place when the tensile strength of the protoplasmic matrix in which the starch granules are embedded has been surpassed, and this being so it might be anticipated that those cells which contain the larger amount of proteïn material would probably best resist the internal stresses and strains, a deduction in close agreement with observed facts, steely grains being as a rule richer in proteïn than mealy grains. Brown and his co-workers determine the coefficient of mealiness of a barley as follows: Five hundred corns are cut transversely in a corn cutter and the percentage of mealy, half mealy and steely corns is noted. The number 100 is taken to represent complete mealiness, 1 complete steeliness, and 50 the intermediate class. If the percentage of each class be multiplied by its special value, and the sum of the products divided by 100, the result is the coefficient of mealiness. By steeping and drying a very steely Scottish barley, the coefficient of mealiness was raised from 29.7 to 87.1, whilst concurrently the specific gravity fell from 1.417 to 1.289.

Barley even of the same kind varies widely in its chemical composition, but on an average the proximate constituents of British malting barleys be within the following limits:—

Moisture	18	—12	per cent.
Nitrogenous matters expressed as proteïns	8	—15	”
Fat	2	— 2.5	”
Starch	60	—65	”
Sugars	1.5	— 2.0	”
Gums	1.7	— 2.0	”
Fibre (cellulose)	5	— 7	”
Ash	2	— 2.5	”

Any sample of barley which contains more than 20% of moisture would be considered damp. The late Professor Lintner expressed the view several years ago that a good malting barley should not contain more than 10% of proteïn, but R. Wahl asserts that in America six-rowed barleys containing a far higher percentage of proteïn are used successfully, indeed preferably, for malting purposes. The only precise knowledge we possess of the proteïn compounds of barley is due to the researches of T. B. Osborne. According to this observer, barley contains the under-mentioned compounds of this class in the following proportions:—

Soluble in water	Leucosin (albumin) Proteose	0.30	per cent.
Soluble in salt solution:	Edestin (globulin)	1.95	”
Soluble in 75% alcohol	Hordeïn	4.00	”
	Insoluble proteïn	4.50	”
Total		10.75	”

It should be pointed out here that the above are only average values for the particular samples of barley investigated. Undoubtedly the nitrogenous constituents of different barleys vary widely in nature as well as in amount.

Raw barley contains enzymes, thus diastase of translocation, so called by Horace T. Brown and G. H. Morris, and catalase (H. van Laer). Proteolytic enzymes appear only to arise with the beginning of germination; but it has been asserted that raw barley contains proenzymes (zymogens), which can be rendered active by treatment with dilute lactic acid at an appropriate temperature. The action of the diastase of raw barley on starch has been studied by Julian L. Baker.

Barley should not be cut until it is properly ripe, but over-ripeness is much more to be guarded against by the maltster than premature cutting, as it is accompanied by a loss in germinative power. Moreover, unripe corn may to a certain extent be matured in stack, whilst a great improvement in germinative capacity is frequently produced by sweating. Very wet seasons are prejudicial to the ripening of the grain, and when the

latter is stacked in too moist a condition it is apt to become what is known as mow burnt. Especially is this the case with barleys containing large percentages of nitrogen and of high enzymatic activities. Such barleys are denoted “warm” by M. Delbrück from their tendency to heat when stored in a moist condition. The effect of this heating is exhibited in the corns becoming black and discoloured at the tips; they are then said to be magpied. Even in an otherwise dry season a large amount of rain during harvest causes the corns to become “weathered,” whilst some of them begin germinating and rot. At the same time heavy dews at night whilst the barley lies cut in the field, or even a sprinkling of rain, assists in mellowing the grain, which often in consequence works the more freely on the malting floors. Properly harvested barley is all the better for remaining in stack for two or three months, as was the practice in former years; if, however, it has been stacked too wet the sooner it is broken down the better.

It is difficult to give any specific test for ripeness, but a series of observations has been made by H. T. Brown and F. Escombe. Samples of barley were taken from the field on the 20th, 24th and 29th of July, and on the 2nd, 6th and 10th of August, and preserved in spirit so that they remained in the same state as when they were gathered. Sections were then cut of these corns, when it was found that the progress of maturation is attended by deformation and ultimate disintegration of the cell nuclei. The change which is denoted by the term nuclear senescence is said to begin in the starch-containing cells, near the periphery of the corn, immediately underlying the layer next to the aleurone layer. This deformation is followed by complete disintegration of the nucleus, and at the end of seven or eight days nearly the whole of the endosperm has been involved. Brown and Escombe state that when this nuclear test is properly applied it stamps as immature those corns in a sample which are manifestly unripe owing to premature desiccation as well as those in which the ratio of nitrogen to carbohydrate is unduly high, owing to an excess of nitrogenous manure in the soil, or to sparser sowing with its consequent reduction of root competition. This method, interesting though it be, is not fitted for practical use, and the agriculturist must rely as heretofore upon empirical methods for deciding whether or not the grain has attained ripeness or maturity.

The bushel weight is a useful criterion in arriving at an opinion regarding the value of a sample of barley; but in basing judgment upon this factor regard must be paid to the fact already mentioned that if the grains be dressed closely the bushel weight is increased. The reason of this is that with the removal of the awns the corns pack more closely together. The best British malting barleys should weigh 52-56 lb per bushel, the standard weight for malting barleys being 56 lb.

During the storage of barley access of air is necessary, otherwise the grain dies from asphyxiation. Sound barley after being kiln-dried retains its vitality for a number of years; but the statement that the corns found in the Egyptian mummy cases, in which they had remained for several thousands of years, were still capable of germination, is contrary to modern experience. Moisture must also be carefully excluded, as it initiates germination in a few cells only of the endosperm and causes heating. A constant repetition of wetting such as may take place on account of alterations of the atmospheric temperature, which causes moisture to be deposited, in the form of dew, may ultimately destroy the vitality and foster the growth and development of mould fungi which usually grow on broken and damaged corns. In this connexion the advantage of screening and sweating of barley before storing it will be apparent (see below).

An immense amount of damage is caused to the grain, during storage, by various insects, one of the most destructive of these being the common weevil (*Calandra granaria*). When fully developed this insect measures $\frac{1}{6}$th to $\frac{1}{8}$th of an inch in length, and is of a bright chestnut colour. The larvae are fleshy legless grubs, shorter than the perfect insect, with a series of tubercles along each side of the body; the head is round with strong jaws. The pupa is white, clear and transparent, showing the form of the future weevil. The female bores a hole in the grain with her snout and deposits an egg. The larva when hatched lives on the contents of the grain and undergoes its changes therein. Windisch asserts that only barley which has ripened in the granary is attacked by weevil. Grain which is only slightly attacked should be kilned at a temperature of 122° F., which destroys the weevil in all stages of development. To detect weevil in a sample of barley, the grain should be spread out on a sheet of white paper in bright sunlight. If weevils are present they soon appear, and betake themselves to a position outside the sunlight, to which they are averse. Treatment of the grain with carbon bisulphide has been suggested as a means of destroying weevil; even if efficacious, however, such a process could not be recommended on account of its danger, carbon bisulphide being highly inflammable. The only practical means of ridding a granary or shop of weevil is to clear out all the grain and leave it empty for a year or more.

The vitality of barley may be determined by causing a sample to germinate in any of the well-known forms of apparatus devised for that purpose, and counting the percentage of germinating and idle corns. The germinative capacity of a sample of barley may frequently be raised by sweating (see below), which, as already mentioned, brings about a kind of artificial maturation.

Malting.—There are two systems of malting used in England: floor malting and pneumatic or drum malting. These systems will be described separately.

A floor malting consists of a rectangular building of several storeys, having the cisterns at one end and the kilns at the other. The uppermost floor is devoted to barley.

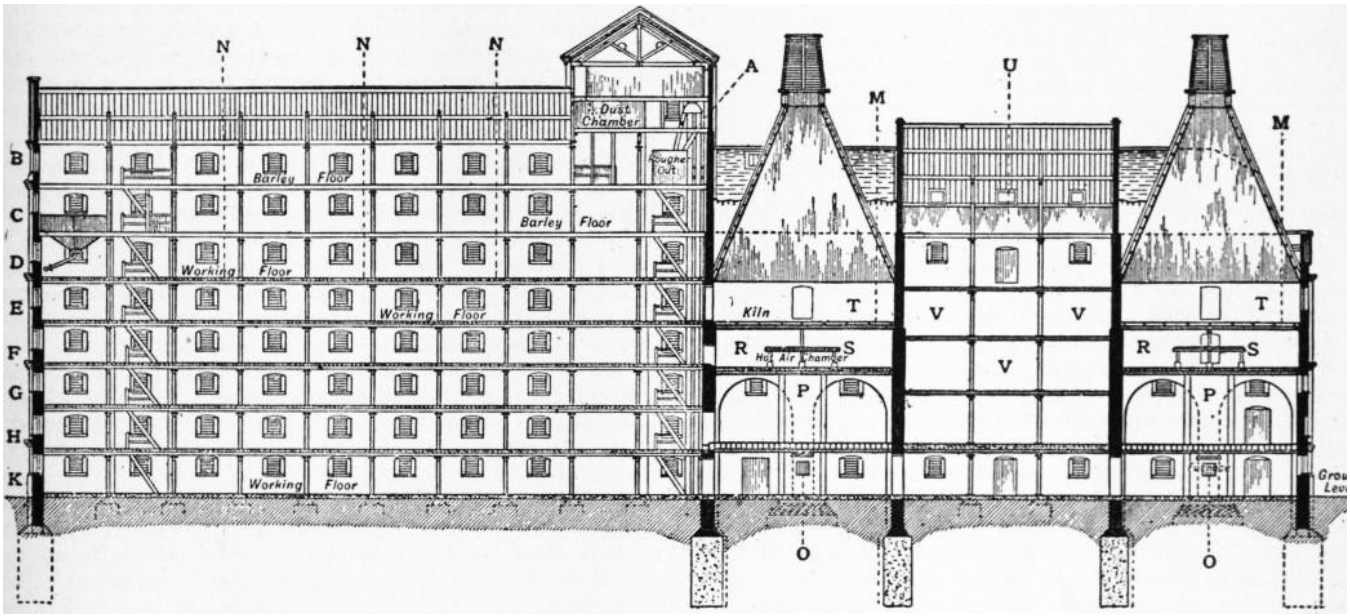


FIG. 8.—Longitudinal section of 200 quarter malting at Mortlake. (Julian L. Baker, architect.)

Figure 8 shows a longitudinal section of Messrs Watney, Combe, Reid & Co.'s 200 quarter malting at Mortlake. The barley is carried to the top of the building by the elevator A, where the screening and dressing machinery is situated. After leaving these machines the grain is conveyed on bands to the barley floors B and C. The floor C contains also the steeping cisterns. The six working floors are D, E, F, G, H, K. The floors are ventilated by louvres, N, N, N. The cisterns are connected to the floors by means of plugs. The "pieces," as they are termed, of germinating barley are gradually worked along the floors to the kilns M, M, on to which they are loaded by rotary bands. The fire-places O, O, are arranged so that the draught may be easily controlled. The hot air and products of combustion pass up the shafts P, P, to the hot-air chamber R, R, where they strike the baffle plates S, S. These plates disperse the hot air and gases evenly beneath the kiln floors T, T, through the green malt. After drying and curing, the malt is allowed to cool and is then carried by bands to the floor U, where by suitable machinery the coombs or rootlets are removed. The finished malt is stored in the bins V, V, V.

On arrival at the malting the barley has to be put through the following operations seriatim: receiving, hoisting and weighing, rough screening, drying and sweating, storing until required for use, screening, grading and removing broken corns, steeping, couching, flooring, withering, drying and curing, dressing and polishing, storing, weighing, sacking and discharging the finished malt.

In sweating barley the temperature should not be allowed to rise above 120° F.; it is usually conducted at 100° F.; and subsequently the barley should be stored for some weeks before it is steeped.

The capacity of a malting is described by the number of quarters which are put through it every four days. A fifty quarter malting does not merely mean that the cisterns have a capacity of fifty quarters, but that this quantity of barley goes through the house every four days. The average time the germinating barley is on the floors is twelve days, and, as a rule, kilning occupies four days. If, as sometimes happens, the malt has to be kept on the floors thirteen, fourteen, fifteen days, or even longer, the malting is not being worked at the capacity under which it is described, and the kilns may remain unused for a day or more. Conversely, when the malt is loaded at less than twelve days, a day or two has to be missed in steeping. In the former case when the kilns are not being used for drying and curing malt, advantage may be taken to utilize them for sweating barley.

Steeping cisterns were formerly rectangular vessels, of slate, brick or cement, from which the barley had to be discharged by shovelling it out. The forms approved most at the present day are conical and constructed of iron; they have arrangements at the apex of the cone, the lower portion, for discharging the grain by gravitation. The steeping period ranges from 48 to 70 hours; it varies according to the kind of barley, and the time of the year. In some of the older maltings there are no arrangements for heating the steep water, and in the winter steeping has occasionally to be performed with water at a temperature near its freezing-point. Steeping should be carried out at a temperature as near as possible to 55° and not higher than 60° F. The usual practice is to fill the cistern up to a certain height with water and throw the barley into it, stirring it until it is about level; the heavy corns will then sink directly to the bottom, whilst the light corns and refuse float on the surface and may be skimmed off. During the time the barley remains in the cistern it is usual to change the steep water two or three times, generally at intervals of twelve hours or tides. The advantage of this is not merely to keep the grain fresh and sweet, but to bring it into contact with the air during the time it is taking up water. Aëration of the steep has long been recognized in Germany as promoting germination, and several arrangements are on the market enabling air to be passed through the grain while it is in the cistern. It has been recommended by Graham, Stopes, Moritz and Morris, and experimental evidence as to its beneficial effects has been published by Windisch, Bleisch, Will, and Baker and Dick. When the corn is steep ripe it contains some 60% of water. Steeping does not consist, however, merely in the imbibition of a certain amount of water; in order to bring about germination this water must remain within the corn a certain length of time. Thus, although it is quite possible to force the necessary amount of water into the grain in less than the 48-70 hours usually taken up by the steeping process, the grain is not steep-ripe until certain changes initiated by the water have taken place, and these require time for their completion. The following average data are useful to remember in connexion with the steeping process:—

Amount of water in steep-ripe barley (about) 60%.

Matter removed from barley during steeping (about) 1.5%.

Increase in volume of barley due to water absorption (about) 18-20%.

There has been much discussion as to the influence of saline matters in water on the steeping process. The late Professor Lintner stated that common salt in water tended to extract the nitrogenous constituents of the grain, but impeded its germination. Mills and Pettigrew found that waters containing calcium salts extracted a minimum of nitrogenous compounds from the barley; they also came to the conclusion that the esteem in which the Lichfield water is held for steeping purposes is due to the presence of nitrates which, they assert, have a stimulating effect on the subsequent germination of the grain. The writer has added lime-water to the extent of one-third of the total volume of water at the first change, believing it to promote regularity of germination. Bearing in mind, however, the observations of Adrian J. Brown, that the barleycorn is enclosed in a membrane permeable to water but impermeable to most salts, it is difficult to see how the saline constituents of water can have any effect except in removing matter from the external portions of the grain and on those corns which are broken. The apparent beneficial effect of lime-water in the steep is probably entirely due to the removal of matters from the husks or paleae.

Malting floors may be constructed of cement, tiles or slate, the two former being preferable to the latter. Ford, in 1849, recommended 200 sq. ft. per quarter of barley steeped as the area of the working floors, and he was quite convinced of the necessity of allowing ample floor room, so that the grain could be worked on the slow, cool system. Subsequently, however, maltsters reduced their floor area, and put the grain rapidly through the malting, thus producing what is termed “forced” malt. This kind of malt was, however, condemned by practical brewers, and a chemical test whereby forcing could be detected having been devised by E. R. Moritz and G. H. Morris, maltsters have been compelled again to increase the area of their working floors. At the present time the approved area may be placed at 175-200 sq. ft. per quarter of barley steeped. The area is, however, largely ruled by the kind of barley to be malted.

After the barley has been thrown out of the cistern it is made up in a rectangular heap 16-20 in. deep, called the “couch”; the object of this is to enable it to gather heat and so start germinating. It usually remains in couch for 12-24 hours, until in fact the interior portion of the heap registers a temperature of about 60° F. During the days of the malt tax the exciseman gauged the quantity of the barley while it was in the couch. After couching the barley is spread thinly and evenly on the floor, forming what is known as the young floor or No. 1 piece. The first visible sign of germination is the sprouting of the rootlet, termed “chitting,” and this occurs either while the grain is on the couch or on the young floor. As already mentioned, it may be quickened by aerating the grain in the cistern. From the time the barley is first cast out of the cistern up to the stage of the young floor, or No. 1 piece, it has a pleasant ethereal odour resembling apples. Drs Thomson, Hope and Coventry stated in the earlier part of the 19th century that they distilled “spirits” from germinating barley at this stage. In the light of our present knowledge it would not be surprising if alcoholic fermentation were proved to occur within the grain at this stage, since intramolecular or anaerobic respiration in certain vegetables has been found to be due to alcoholic fermentation.

The thickness at which the young floor is spread depends upon the outside temperature and the nature of the barley. If the weather be warm, or if there be a tendency for the barley to heat, the piece must be spread all the thinner. At this stage the grain loses its external wet appearance. When spread too thickly the grain will begin to sweat, and the rootlets will be thrown out suddenly and unevenly. As a rule, under these circumstances, the rootlets will be long and thin, when they are said to be “wild.” A piece which has been allowed to get into this condition must at once be spread thinner. If the sweating has not continued long, the harm done may be confined to increased loss by respiration. The young floor is usually turned with a plough twice during twelve hours, and it may be forked between whiles, but no hard and fast rule can be laid down as to when this is necessary; it must be left to the maltster’s judgment, as it depends entirely on what is going on within the grain. The object of turning is in the first place to aerate the grain and freshen it, secondly to check excessive rise of temperature, and thirdly to promote evenness of growth. Too frequent turning is not to be advised. After remaining four days on the young floor three or four rootlets should have appeared, and the acrospire should have begun to grow up the back of the corn. The apple-like odour of the piece then gives place to one resembling that of the common rush, and this should continue the whole time that the malt remains on the floor. On the fifth day the piece is next moved to No. 2 position, a stage nearer the kiln. It is here that sprinkling is resorted to when necessary. The amount of sprinkling and the time it is given cannot be exactly prescribed. The amount may vary from two to five gallons per quarter, and it should only be given when the rootlets, which ought to be short and curly, and five or more in number, show signs of losing their freshness. If an excessive amount of sprinkling be given forced growth ensues. It is preferable not to add the whole of the water at one time, but to divide it over two lots; and immediately after the piece has been sprinkled it should be thoroughly and carefully mixed, otherwise some of the grain will receive an undue proportion of water. When all the sprinkling water has been given to the piece, which as a rule should not be done later than at the sixth or seventh day of flooring, the temperature should be kept down to about 55° F. by turning. Too frequent turning may, however, detach the rootlet, and it may cause the grain to lose its vitality prematurely, so that growth of the acrospire stops.

By about the eighth day of flooring the acrospire should be about three-quarters up the corn. After this the germinating corn is moved forward to No. 3 piece, which is at first spread as thinly on the floors as in the previous pieces. Here it gradually dries and incipient withering of the rootlets sets in. The only treatment which is now given to the grain is to heap it up thicker and thicker by degrees until it is ready for loading on the kiln. This increase in thickness of the piece (now called the old piece) should not be too sudden, especially if the grain be fresh in appearance and contain a large quantity of water. When the piece is thickened up to say 10 in. in depth, while it is in a very moist condition, heating and sweating take place, with additional growth of acrospire and rootlet. Under such forcing conditions a large production of sugar and degradation of the proteïns will take place. When, however, the moisture has been gradually reduced before thickening up, the rootlet dies off; and although increase of temperature may occur, this is accompanied by little or no further growth of the acrospire, action being confined to the mellowing of the grain by the enzymes. When the malt is ready for loading on the kiln it should be possible to break down the contents of each corn between the thumb and finger. Opinions differ as to what the final temperature on the withering floor should be. If the

moisture content of the malt be about 50%, the piece must be kept thin to avoid sweating. But under these conditions mellowing does not occur, hence the necessity of reducing the moisture content gradually after the last sprinkling water has been given. When the process has been conducted properly the temperature of the old piece may be allowed to rise as high as 70° F. during the six hours previous to loading. The moisture content of the green malt when loaded should not be much above 40%.

The endosperm of green malt which is ready for the kiln should be soft and mealy, and should not exude moisture when pressed between the thumb-nails, but should crumble and disintegrate to a chalky mass having little or no adhesiveness.

The foregoing observations are not to be regarded as hard and fast rules, but they are simply intended to give some indications of the malting process when it proceeds on normal lines; it may be that on account of the presence of damaged corns the piece begins to develop mould by about the tenth day, and it then has to be kept thin and sometimes even loaded on kiln prematurely.

The malt made for grain distillers, in which a high diastatic activity is required, is manufactured on quite different lines from those above indicated. It is often sprinkled late, and loaded on kiln often in a sodden condition. In some cases sprinkling on kiln is resorted to, but it is doubtful if this leads to the desired object. Other things being equal, the smaller the corns—*i.e.* the greater number of embryos in a given weight—the higher the diastatic activity of the malt. In selecting a barley for the production of highly diastatic malt, the diastatic power of the original raw grain is a factor of great importance.

Kilning.—When loaded on kiln, malt intended for brewing ale and stout is, if properly withered, in a moribund condition; nevertheless, during the first stages of the kilning process a certain amount of vital activity is manifested, and the malt undergoes mellowing by the action of enzymes on the contents of the endosperm. If the malt be loaded while the rootlets appear fresh on account of the presence of too much moisture, rapid growth of the acrospire ensues, giving rise to overshot corns, known in Germany as “hussars.” To check this the moisture must be rapidly removed by the passage of large volumes of air through the malt. But under such circumstances mellowing does not occur. The ideal conditions of kilning are when the malt has been properly withered on the floors before loading, and, assuming that drying and curing occupy four days, that 25-30% of the moisture be removed very gradually, this occupying the first three days, at the end of which the malt is said to be hand-dry. The thickness at which the malt is spread on the kiln should not exceed 7-8 in., and until hand-dry (that is to say, reduced to a moisture content of 12-15%) it should not be turned; if moved at all (and that only is necessary when reek occurs), it should only be lightly forked. The rate at which the temperature is raised depends largely on the kind of malt to be made and the construction of the kiln. If high flavour and colour are required, these are produced by keeping the malt for several hours near a temperature of 160° F. while it still contains 12-15% of moisture. If more than this amount of moisture be present when the temperature reaches the limit just mentioned, the conditions known as stewing would obtain, with the result that “forced” malt would be produced. A certain amount of colour is produced at the final temperature to which the malt is raised; but when such means are relied upon for the production of the greater part of the colour, reduction of extract and deficiency of flavour follow, the colour being then almost exclusively the result of caramelization of the carbohydrates.

The so-called curing stage constitutes the last part of the kilning process, and the malt must then be turned frequently to ensure uniformity of action. Mechanical turners are exceedingly useful for this purpose. Curing in a drum, as in the so-called pneumatic malting process (see below), also effects satisfactory curing.

The following table will give an idea of the kilning temperatures usually employed for the three kinds of malt mentioned, but it must be remembered that these temperatures are largely regulated by the construction of the kiln and the amount of draught available. In this connexion it may be mentioned that the final curing temperature is not necessarily a criterion of the tint of the malt. A malt may have been finished off at a very high temperature and still be a pale malt, provided the moisture percentage has been sufficiently reduced in the initial stages of kilning.

Running	Pale Malt.	Ale Malt.	Amber Malt.
1st day temp.	90-100° F.	90-100° F.	90-100° F.
2nd ” ”	100-120	100-120	100-130
3rd ” ”	120-130 (10 hrs.)	120-130 (6 hrs.)	130-150 (6 hrs.)
3rd ” ”	130-180 (8 ”)	130-150 (12 ”)	150-160 (12 ”)
3rd ” ”	180-190 (6 ”)	150-180 (6 ”)	160-180 (6 ”)
4th ” ”	drop to 170 (12 ”)	180-190 (12 ”)	180-200 (12 ”)
4th ” ”		190-200 (6 ”)	200-220 (6 ”)
4th ” ”		drop to 180 (6 ”)	drop to 190 (6 ”)

The average laboratory values obtained from malts of the descriptions after about two months’ storage should be as follows:—

Running	Pale Malt.	Ale Malt.	Amber Malt.
Extract per standard quarter of 336 ℔	95-98 ℔	94-96 ℔	94-96 ℔
Moisture	about 2.0% in each case		
Diastatic activity (Lintner)	30-35	20-30	8-10
Tint (Lovibond 52 series neutral)	3-5	6-8	20-25

Metabolic Changes.—All through the malting process metabolic changes are proceeding, in which both carbohydrates and proteïns are concerned. In its resting stage the embryo of a barleycorn is generally free from starch; as soon as germination sets in, however, starch appears in the scutellum, while the amount of sucrose there present increases, these being apparently formed from maltose originating from the action of

diastase on the starch of the endosperm. Sucrose also augments in the aleurone layer, but starch is never formed in the aleurone cells. These changes occur when the malt is first loaded on kiln; indeed, at no part of the malting process is there greater physiological activity.

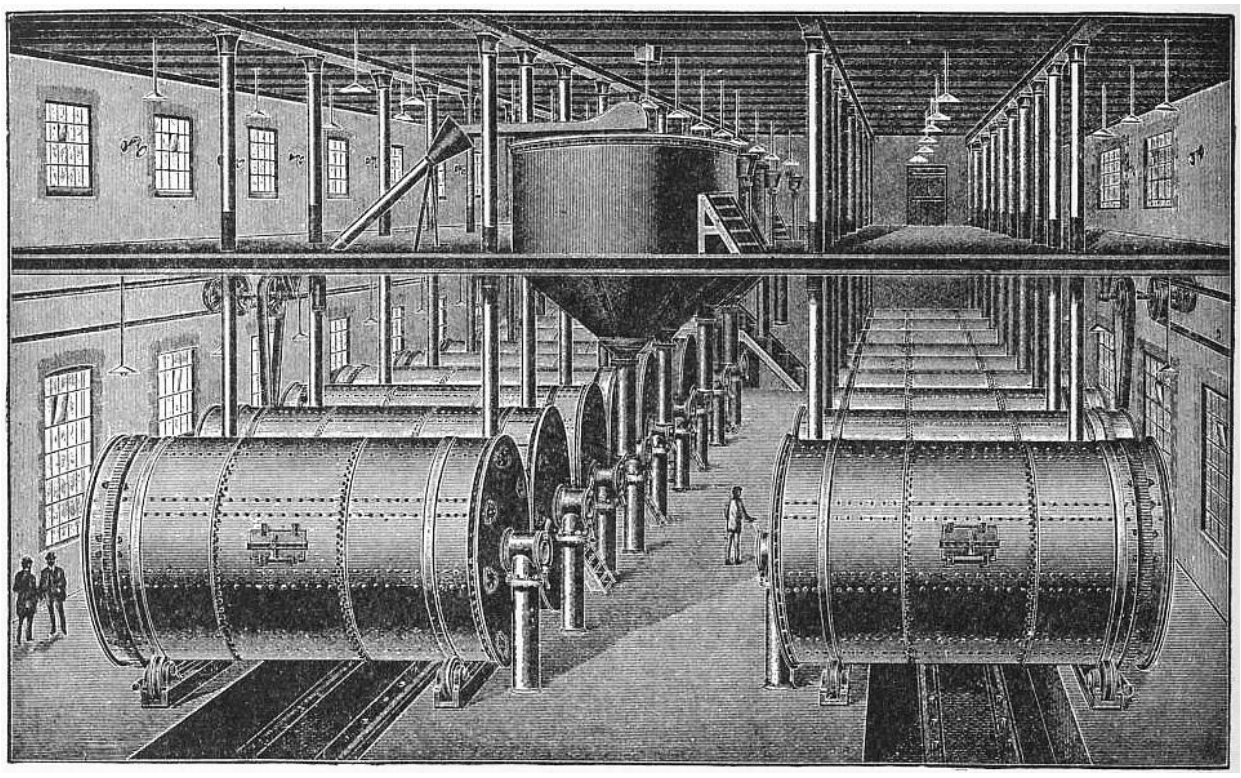
Kilning has been specially studied by J. Grüss, who divides the process into four stages, the first being that at which the temperature limit is 113° F. It is characterized by a continuation of the living processes, especially growth of the acrospire, which, as already stated, proceeds too far if the malt be loaded too wet. In any case the rootlet dies away. The metabolism of the carbohydrates already mentioned is accompanied by that of the nitrogenous constituents, the reserve proteïn of the sub-aleurone layer being attacked by proteolytic enzymes and broken down into simpler compounds. This is a most important matter from the point of view of the brewing value of barley, for the degradation products of the proteïns are necessary constituents of wort as yeast food. Moreover, unless proper modification of these proteïn bodies occurs it is impossible to produce tender malt. A barley which contains a high percentage of reserve proteïn is as a rule unfitted for malting purposes, and indeed, the higher the proteïn content the greater the difficulty the maltster experiences in dealing with it. Proteïn hydrolysis requires the presence of a certain amount of moisture, and if this be removed too rapidly by a forced draught at the early stages of kilning the proteolytic enzymes cannot perform their function. If, on the other hand, the grain be loaded in too moist a condition, and the temperature be raised too quickly, the proteolytic enzymes lose their activity and the proteïns remain for the most part unattacked. When germination is allowed to proceed on the kiln too great degradation of the proteïn occurs, and the malt is liable to produce fretty beers, on account of the presence of an excessive amount of nitrogenous nutritive matter, which leads to the development of disease organisms.

The second stage of the kilning process, according to Grüss, is that at which the temperatures range from 113° to 167° F. The life of the corn is now suspended, but enzymatic processes continue. The starch is further saccharified, and the dividing line of the aleurone layer at the furrow is attacked, as are also the cell walls of the endosperm, which are still intact, these being partially converted into gummy substances. This change, however, also requires the presence of a certain amount of moisture. If too much air be passed through the malt at this stage the above-named dividing partition of the cell walls is not attacked. The air may expand the grain to some extent and produce malt of a low bushel weight, which, however, is not properly modified and cannot give satisfactory results in practice.

During the third stage of kilning, an enzyme, which Grüss claims to have recognized, and which he denotes spermoxidase, is said to exert its activity.

Schönfeld has confirmed the discoveries of Grüss by practical experiments.

Fuel.—The fuel used for drying and curing malt is either anthracite or coke, and the greatest care is necessary in selecting it on account of its liability to contain arsenic, which is to a greater or less extent an invariable constituent of all coal. The fuel used for malting purposes should not contain more arsenic than $\frac{1}{20}$th grain per lb. Gas coke should on no account be used, unless it has been proved to be sufficiently free from arsenic; but the best oven coke frequently contains so little arsenic that it may be employed with perfect safety, especially if it be mixed with a proportion (*e.g.* 5%) of milk of lime, which retains the arsenic as calcium arsenate. In Germany malt is, as a rule, dried and cured with hot air, whilst in Great Britain the products of combustion are passed through the malt, as it is believed that they exert a beneficial influence on the flavour. The proportion of fuel used for drying and curing malt varies according to the quality of the fuel and the construction of the kiln, but on an average it may be placed at 50-80 lb per quarter.



[From Sykes & Ling, *Principles and Practice of Brewing* (1907), Charles Griffin & Co., Ltd.]

FIG. 9.—Diagrammatic view of pneumatic malting, showing pneumatic washing and steeping cisterns.

Storing.—After the malt has passed through the curing stage it is generally heaped up for a few hours. This is believed to increase its flavour. The malt is then stripped from the kiln, and the rootlets, technically known

as the coombs, are removed. Formerly this was effected by workmen treading the malt, who wore heavy boots for the purpose. At the present time, however, the rootlets are usually removed by machinery, special forms of which have been devised for this as well as for dressing and polishing the malt. It is the custom of some maltsters to store malt with the rootlets still attached; but this is an objectionable practice, since malt coombs attract moisture, and the presence of more than 3% of moisture in malt produces the condition known as "slackness." When the malt is packed in bin it is often covered with a layer of coombs, which then prevent access of atmospheric moisture. Malt, to preserve its good qualities intact, should be stored in bins made as nearly as possible air-tight, and it should never be placed in bin until it is quite cool. It is probably wrong to store malt in bins adjacent to the kilns, where it is kept at a higher temperature than that of the surrounding atmosphere. During storage of the malt a kind of mellowing occurs, the mechanism of which is not understood. It is, however, known by practical brewers that the best results cannot be obtained when new malt is used.

Premature Malting.—Several years ago Galland suggested germinating barley in a drum, his idea being to do away with handling of the grain, and also to be independent of changes of atmospheric temperature. The latest development of this system, the so-called Galland-Henning process of pneumatic malting, has been improved by Mr R. Blair Robertson, and a diagrammatic view of the interior of one of these maltings, showing the drums and conical steeping cisterns, is shown in fig. 9.

The drums are provided with a perforated channel for the passage of air through the malt, which is packed in the annular space between this channel and outside wall of the drum. Each drum is capable of revolving on its axis, and there are arrangements for passing either moist, saturated or dry air through the malt. The system as now improved is capable of producing some of the best malt, especially if, after germination has been completed in the drums, the green malt is loaded on an ordinary kiln and the initial stages of kilning (see above) conducted in the usual way; the curing, however, may be carried out successfully in a special form of drum.

Yield and Weight.—The malting process is attended with a certain amount of loss of dry substance of the barley, as follows:—

In the steep	1.5	to	2.0%
By respiration on floors and on kilns	3.0	”	5.0%
Coombs	3.0	”	4.0%
	—		——
Total	7.5	”	11.0%

In addition to this, barley, as already mentioned, contains from 15 to 20% of moisture, whereas finished malt contains 1 to 2%. The total loss in weight which barley undergoes in the malting process may be put down at from 17 to 28%. Since, however, malt is lighter than barley (and the quantity of both was in former years measured exclusively by volume), it frequently happens that a given number of quarters of barley yields a larger number of quarters of finished malt. When this happens it is usual to speak of an increase having been obtained. At the present time weight replaces measure for both barley and malt, and although it is usual to speak of the quantity of grain in terms of quarters, what is meant is not the measured quarter, but so many weighed standard quarters. The standard quarter for English malting barley is 448 lb and for malt 336 lb. From this it will be seen that when a given number of weighed quarters of barley yields the same number of quarters of finished malt, the actual yield is 75%, and there is then said to be neither increase nor decrease. As a rule, in practical working the yield of malt varies from a 4% decrease to a 10% increase, corresponding to an actual yield on the original barley of 72 to 82.5%.

J. Baverstock, an old writer, says that finished malt should weigh one-fifth less than the barley from which it is produced. This corresponds to a malting increase of about 7%, which is a high yield. As a rule, foreign barley will give a greater malting increase than English barley, because, on the one hand, the former usually contains less moisture than the latter, and, further, because there is less loss on the floors by respiration and rootlet growth.

The yield of malt from barley may be determined in the laboratory in an extremely simple manner. Since every grain of barley must yield a grain of malt, if we know the respective weights of a definite number of barley and malt grains, provided that this number is large enough to represent the average, then obviously this gives the data requisite for calculating the yield of malt from barley. The number of corns the weight of which is determined for this purpose is usually 1000, and if the weight of this number be determined on several different 1000 corns, the average will closely approximate to the truth. Instead of counting the corns by hand, an instrument may be used for this purpose.

If 1000 corns of a barley were found to weigh 42 grammes, and 1000 corns of a finished malt from the same barley 32 grammes, then the yield of malt is (32 × 100)/42 = 76.1, this corresponding to a 1% increase. Assuming that the moisture content of the barley was 15% and that of the finished malt 2%, 100 grammes of malt will contain 2 grammes of moisture, and 76.1 grammes will contain (76.1 × 2)/100 = 1.5 grammes moisture; therefore 76.1 grammes of malt contain 76.1 − 1.5 = 74.6 grammes of dry matter. This was obtained from 100 − 15 = 85 grammes of barley dry substance. Hence 100 parts of barley dry substance will yield (74.6 × 100)/85 = 87.7 corresponding with a loss of dry substance equal to 12.5% of the dry substance of the barley, or with a loss of 10.7% on the barley containing 15% of moisture.

The results obtained by this method of laboratory control when it is accurately carried out agree very closely with those deduced from the practical results of weighing the barley, malt and coombs in the malting.

Special Malts.—In addition to the kinds of malt considered in what precedes, there are others mostly used for imparting specific flavours and colour to beers and stout. These are crystal malt, imperial malt, brown or blown malt, and black or roasted malt. Crystal malt is grown for a shortened period on the floors, and then placed in a wire cylinder, which is rotated over a fire so that it is dried at a very high temperature. The weight per quarter is from 250 to 280 lb. Imperial malt is dried off on an ordinary kiln at a final temperature of 240-270° F., but it is not allowed the usual length of time on the withering floor. It is placed on the drying kiln in a layer not exceeding one inch and a half in thickness. A moderate heat from burnt wood is first applied until the bulk of the moisture has been driven off, when the temperature is suddenly raised so that the grains swell some 25% and the malt takes up a strong empyreumatic flavour from the products of combustion. This kind of

malt weighs 270-300 lb per quarter. Black or roasted malt is prepared by roasting malt in a cylinder. Ford states that perfectly malted corn gives a colour of less intensity and permanence than does partially malted corn, and this has been confirmed by other observers. A certain quantity of the so-called black malt is actually made from raw barley, but this gives a product of inferior flavour. The weight per quarter of black malt varies as much as from 215 to 290 lb.

Valuation.—For the valuation of malt the following determinations are usually carried out: Extract per standard quarter, moisture, diastatic activity by the Lintner process, tint, and matters soluble in cold water. The physical examination of malt is also a matter of importance, inasmuch as direct evidence is obtained thereby of the modification of the malt. Among the methods adopted for this purpose may be mentioned counting the percentage of corns in which the acrospire has grown up to one-half, two-thirds and three-fourths the entire length of the corn. In properly made malt the modification of the endosperm should proceed *pari passu* with the growth of the acrospire. The sinker test is also useful when carried out in an intelligent manner. Those corns which sink in water and lie flat are improperly modified. Normal malt has a specific gravity less than water and the corns have equal density throughout; consequently they float horizontally in water. In forced samples the proximal ends are frequently lighter than the distal ends, and the corns float horizontally in water, with the germ directed upwards. The latter, however, may in some cases fill with water, and the corns lie flat or sink. This is a characteristic of over-modified malt. It will be seen from these remarks that it is essential to carry out the sinker test under standard conditions. The modification of the malt may also be determined by means of the diaphanoscope already referred to under Barley.

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