Title: Encyclopaedia Britannica, 11th Edition, "Latin Language" to "Lefebvre, François-Joseph"

Author: Various

Release date: December 21, 2012 [EBook #41685]

Language: English

Credits: Produced by Marius Masi, Don Kretz and the Online Distributed Proofreading Team at http://www.pgdp.net



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# THE ENCYCLOPÆDIA BRITANNICA

# A DICTIONARY OF ARTS, SCIENCES, LITERATURE AND GENERAL INFORMATION

## ELEVENTH EDITION

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## VOLUME XVI SLICE III

## Latin Language to Lefebvre, François-Joseph

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## Articles in This Slice

## LATIN LANGUAGE.

1. *Earliest Records of its Area.*—Latin was the language spoken in Rome and in the plain of Latium in the 6th or 7th century B.C.—the earliest period from which we have any contemporary record of its existence. But it is as yet impossible to determine either, on the one hand, whether the archaic inscription of Praeneste (see below), which is assigned with great probability to that epoch, represents exactly the language then spoken in Rome; or, on the other, over how much larger an area of the Italian peninsula, or even of the lands to the north and west, the same language may at that date have extended. In the 5th century B.C. we find its limits within the peninsula fixed on the north-west and south-west by Etruscan (see ETRURIA: *Language*); on the east, south-east, and probably north and north-east, by Safine (Sabine) dialects (of the Marsi, Paeligni, Samnites, Sabini and Picenum, *qq.v.*); but on the north we have no direct record of Sabine speech, nor of any non-Latinian tongue nearer than Tuder and Asculum or earlier than the 4th century B.C. (see UMBRIA, IGUVIUM, PICENUM). We know however, both from tradition and from the archaeological data, that the Safine tribes were in the 5th century B.C. migrating, or at least sending off swarms of their younger folk, farther and farther southward into the peninsula. Of the languages they were then displacing we have no explicit record save in the case of Etruscan in Campania, but it may be reasonably inferred from the evidence of place-names and tribal names, combined with that of the Faliscan inscriptions, that before the Safine invasion some idiom, not remote from Latin, was spoken by the pre-Etruscan tribes down the length of the west coast (see FALISCI; VOLSCI; also ROME: *History*; LIGURIA; SICULI).

2. *Earliest Roman Inscriptions.*—At Rome, at all events, it is clear from the unwavering voice of tradition that Latin was spoken from the beginning of the city. Of the earliest Latin inscriptions found in Rome which were known in 1909, the oldest, the so-called "Forum inscription," can hardly be referred with confidence to an earlier century than the 5th; the later, the well-known *Duenos* (= later Latin *bonus*) inscription, certainly belongs to the 4th; both of these are briefly described below (§§ 40, 41). At this date we have probably the period of the narrowest extension of Latin; non-Latin idioms were spoken in Etruria, Umbria, Picenum and in the Marsian and Volscian hills. But almost directly the area begins to expand again, and after the war with Pyrrhus the Roman arms had planted the language of Rome in her military colonies throughout the peninsula. When we come to the 3rd century B.C. the Latin inscriptions begin to be more numerous, and in them (*e.g.* the oldest epitaphs of the Scipio family) the language is very little removed from what it was in the time of Plautus.

3. *The Italic Group of Languages.*—For the characteristics and affinities of the dialects that have just been mentioned, see the article ITALY: *Ancient Languages and Peoples*, and to the separate articles on the tribes. Here it is well to point out that the only one of these languages which is not akin to Latin is Etruscan; on the other hand, the only one very closely resembling Latin is Faliscan, which with it forms what we may call the Latinian dialect of the Italic group of the Indo-European family of languages. Since, however, we have a far more complete knowledge of Latin than of any other member of the Italic group, this is the most convenient place in which to state briefly the very little that can be said as yet to have been ascertained as to the general relations of Italic to its sister groups. Here, as in many kindred questions, the work of Paul Kretschmer of Vienna (*Einleitung in die Geschichte der griechischen Sprache*, Göttingen, 1896) marked an important epoch in the historical aspects of linguistic study, as the first scientific attempt to interpret critically the different kinds of evidence which the Indo-European languages give us, not in vocabulary merely, but in phonology, morphology, and especially in their mutual borrowings, and to combine it with the non-linguistic data of tradition and archaeology. A certain number of the results so obtained have met with general acceptance and may be briefly treated here. It is, however, extremely dangerous to draw merely from linguistic kinship deductions as to racial identity, or even as to an original contiguity of habitation. Close resemblances in any two languages, especially those in their inner structure (morphology), may be due to identity of race, or to

long neighbourhood in the earliest period of their development; but they may also be caused by temporary neighbourhood (for a longer or shorter period), brought about by migrations at a later epoch (or epochs). A particular change in sound or usage may spread over a whole chain of dialects and be in the end exhibited alike by them all, although the time at which it first began was long after their special and distinctive characteristics had become clearly marked. For example, the limitation of the word-accent to the last three syllables of a word in Latin and Oscan (see below)—a phenomenon which has left deep marks on all the Romance languages—demonstrably grew up between the 5th and 2nd centuries B.C.; and it is a permissible conjecture that it started from the influence of the Greek colonies in Italy (especially Cumae and Naples), in whose language the same limitation (although with an accent whose actual character was probably more largely musical) had been established some centuries sooner.

4. *Position of the Italic Group.*—The Italic group, then, when compared with the other seven main "families" of Indo-European speech, in respect of their most significant differences, ranges itself thus: 

(i.) *Back-palatal and Velar Sounds.*—In point of its treatment of the Indo-European back-palatal and velar sounds, it belongs to the western or *centum* group, the name of which is, of course, taken from Latin; that is to say, like German, Celtic and Greek, it did not sibilate original *k* and *g*, which in Indo-Iranian, Armenian, Slavonic and Albanian have been converted into various types of sibilants (Ind.-Eur.* *kṃtom* = Lat. *centum*, Gr. (ἑ)-κατόν, Welsh *cant*, Eng. *hund*-(*red*), but Sans. *śatam*, Zend *satƏm*); but, on the other hand, in company with just the same three western groups, and in contrast to the eastern, the Italic languages labialized the original velars (Ind.-Eur. * *qod* = Lat. *quod*, Osc. *pod*, Gr. ποδ-(απός), Welsh *pwy*, Eng. *what*, but Sans. *kás*, "who?").

(ii.) *Indo-European Aspirates.*—Like Greek and Sanskrit, but in contrast to all the other groups (even to Zend and Armenian), the Italic group largely preserves a distinction between the Indo-European *mediae aspiratae* and *mediae* (*e.g.* between Ind.-Eur. *dh* and *d*, the former when initial becoming initially regularly Lat. *f* as in Lat. *fēc-ī* [cf. Umb. *feia*, "*faciat*"], beside Gr. ἔ-θηκ-α [cf. Sans. *da-dhā-ti*, "he places"], the latter simply *d* as in *domus*, Gr. δόμος). But the *aspiratae*, even where thus distinctly treated in Italic, became fricatives, not pure aspirates, a character which they only retained in Greek and Sanskrit.

(iii.) *Indo-European ŏ.*—With Greek and Celtic, Latin preserved the Indo-European *ŏ*, which in the more northerly groups (Germanic, Balto-Slavonic), and also in Indo-Iranian, and, curiously, in Messapian, was confused with *ă*. The name for olive-oil, which spread with the use of this commodity from Greek (ἔλαιϝον) to Italic speakers and thence to the north, becoming by regular changes (see below) in Latin first **ólaivom*, then **óleivom*, and then taken into Gothic and becoming *alēv*, leaving its parent form to change further (not later than 100 B.C.) in Latin to *oleum*, is a particularly important example, because (*a*) of the chronological limits which are implied, however roughly, in the process just described, and (*b*) of the close association in time of the change of *o* to *a* with the earlier stages of the "sound-shifting" (of the Indo-European plosives and aspirates) in German; see Kretschmer, *Einleit*. p. 116, and the authorities he cites.

(iv.) *Accentuation.*—One marked innovation common to the western groups as compared with what Greek and Sanskrit show to have been an earlier feature of the Indo-European parent speech was the development of a strong expiratory (sometimes called stress) accent upon the first syllable of all words. This appears early in the history of Italic, Celtic, Lettish (probably, and at a still later period) in Germanic, though at a period later than the beginning of the "sound-shifting." This extinguished the complex system of Indo-European accentuation, which is directly reflected in Sanskrit, and was itself replaced in Latin and Oscan by another system already mentioned, but not in Latin till it had produced marked effects upon the language (*e.g.* the degradation of the vowels in compounds as in *cōnficio* from *cón-facio*, *inclūdo* from *ín-claudo*). This curious wave of accentual change (first pointed out by Dieterich, *Kuhn's Zeitschrift*, i., and later by Thurneysen, *Revue celtique*, vi. 312, *Rheinisches Museum*, xliii. 349) needs and deserves to be more closely investigated from a chronological standpoint. At present it is not clear how far it was a really connected process in all the languages. (See further Kretschmer, *op. cit.* p. 115, K. Brugmann, *Kurze vergleichende Grammatik* (1902-1904), p. 57, and their citations, especially Meyer-Lübke, *Die Betonung im Gallischen* (1901).)

To these larger affinities may be added some important points in which the Italic group shows marked resemblances to other groups.

5. *Italic and Celtic.*—It is now universally admitted that the Celtic languages stand in a much closer relation than any other group to the Italic. It may even be doubted whether there was any real frontier-line at all between the two groups before the Etruscan invasion

of Italy (see ETRURIA: *Language*; LIGURIA). The number of morphological innovations on the Indo-European system which the two groups share, and which are almost if not wholly peculiar to them, is particularly striking. Of these the chief are the following.

(i.) Extension of the abstract-noun stems in *-ti-* (like Greek φάτις with Attic βάσις, &c.) by an *-n-* suffix, as in Lat. *mentio* (stem *mentiōn-*) = Ir. (*er-*)*mitiu* (stem *miti-n-*), contrasted with the same word without the *n*-suffix in Sans. *mati-*, Lat. *mens*, Ind.-Eur. **mn̥-ti-*. A similar extension (shared also by Gothic) appears in Lat. *iuventū-t-*, O. Ir. *óitiu* (stem *oiliūt-*) beside the simple *-tu-* in nouns like *senātus*.

(ii.) Superlative formation in *-is-n̥mo-* as in Lat. *aegerrimus* for **aegr-isn̥mos*, Gallic Οὐξισάμη the name of a town meaning "the highest."

(iii.) Genitive singular of the *o*-stems (second declension) in *-ī* Lat. *agri*, O. Ir. (Ogam inscriptions) *magi*, "of a son."

(iv.) Passive and deponent formation in *-r*, Lat. *sequitur* = Ir. *sechedar*, "he follows." The originally active meaning of this curious *-r* suffix was first pointed out by Zimmer (*Kuhn's Zeitschrift*, 1888, xxx. 224), who thus explained the use of the accusative pronouns with these "passive" forms in Celtic; Ir. *-m-berar*, "I am carried," literally "folk carry me"; Umb. *pir ferar*, literally *ignem feratur*, though as *pir* is a neuter word (= Gr. πῦρ) this example was not so convincing. But within a twelvemonth of the appearance of Zimmer's article, an Oscan inscription (Conway, *Camb. Philol. Society's Proceedings*, 1890, p. 16, and *Italic Dialects*, p. 113) was discovered containing the phrase *ůltiumam* (*iůvilam*) *sakrafír*, "ultimam (imaginem) consecraverint" (or "ultima consecretur") which demonstrated the nature of the suffix in Italic also. This originally active meaning of the *-r* form (in the third person singular passive) is the cause of the remarkable fondness for the "impersonal" use of the passive in Latin (*e.g.*, *itur in antiquam silvam*, instead of *eunt*), which was naturally extended to all tenses of the passive (*ventum est*, &c.), so soon as its origin was forgotten. Fuller details of the development will be found in Conway, *op. cit.* p. 561, and the authorities there cited (very little is added by K. Brugmann, *Kurze vergl. Gramm.* 1904, p. 596).

(v.) Formation of the perfect passive from the *-to-* past participle, Lat. *monitus* (*est*), &c., Ir. *léic-the*, "he was left," *ro-léiced*, "he has been left." In Latin the participle maintains its distinct adjectival character; in Irish (J. Strachan, *Old Irish Paradigms*, 1905, p. 50) it has sunk into a purely verbal form, just as the perfect participles in *-us* in Umbrian have been absorbed into the future perfect in *-ust* (*entelust*, "intenderit"; *benust*, "venerit") with its impersonal passive or third plural active *-us*(*s*)*so* (probably standing for *-ussor*) as in *benuso*, "ventum erit" (or "venerint").

To these must be further added some striking peculiarities in phonology.

(vi.) Assimilation of *p* to a $q^{\mu}$ in a following syllable as in Lat. *quinque* = Ir. *cóic*, compared with Sans. *pánca*, Gr. πέντε, Eng. *five*, Ind.-Eur. **penqe*.

(vii.) Finally—and perhaps this parallelism is the most important of all from the historical standpoint—both Italic and Celtic are divided into two sub-families which differ, and differ in the same way, in their treatment of the Ind.-Eur. velar tenuis *q*. In both halves of each group it was labialized to some extent; in one half of each group it was labialized so far as to become *p*. This is the great line of cleavage (i.) between Latinian (Lat. *quod*, *quandō*, *quinque*; Falisc. *cuando*) and Osco-Umbrian, better called Safine (Osc. *pod*, Umb. *panū-* [for **pandō*], Osc.-Umb. *pompe-*, "five," in Osc. *půmperias* "nonae," Umb. *pumpeḍia-*, "fifth day of the month"); and (ii.) between Goidelic (Gaelic) (O. Ir. *cóic*, "five," *maq*, "son"; modern Irish and Scotch *Mac* as in *MacPherson*) and Brythonic (Britannic) (Welsh *pump*, "five," *Ap* for map, as in *Powel* for *Ap Howel*).

The same distinction appears elsewhere; Germanic belongs, broadly described, to the *q*-group, and Greek, broadly described, to the *p*-group. The ethnological bearing of the distinction within Italy is considered in the articles SABINI and VOLSCI; but the wider questions which the facts suggest have as yet been only scantily discussed; see the references for the "Sequanian" dialect of Gallic (in the inscription of Coligny, whose language preserves *q*) in the article CELTS: *Language*.

From these primitive affinities we must clearly distinguish the numerous words taken into Latin from the Celts of north Italy within the historic period; for these see especially an interesting study by J. Zwicker, *De vocabulis et rebus Gallicis sive Transpadanis apud Vergilium* (Leipzig dissertation, 1905).

6. *Greek and Italic.*—We have seen above (§ 4, i., ii., iii.) certain broad characteristics which the Greek and the Italic groups of language have in common. The old question of the degree of their affinity may be briefly noticed. There are deep-seated differences in morphology, phonology and vocabulary between the two languages—such as (*a*) the loss of

the forms of the ablative in Greek and of the middle voice in Latin; (*b*) the decay of the fricatives (*s*, *v*, *j*) in Greek and the cavalier treatment of the aspirates in Latin; and (*c*) the almost total discrepancy of the vocabularies of law and religion in the two languages—which altogether forbid the assumption that the two groups can ever have been completely identical after their first dialectic separation from the parent language. On the other hand, in the first early periods of that dialectic development in the Indo-European family, the precursors of Greek and Italic cannot have been separated by any very wide boundary. To this primitive neighbourhood may be referred such peculiarities as (*a*) the genitive plural feminine ending in *-āsōm* (Gr. -άων, later in various dialects -έων, -ῶν, -ᾶν; cf. Osc. *egmazum* "rerum"; Lat. *mensarum*, with *-r-* from *-s-*), (*b*) the feminine gender of many nouns of the *-o-* declension, cf. Gr. ἡ ὁδὸς, Lat. *haec fāgus*; and some important and ancient syntactical features, especially in the uses of the cases (*e.g.* (*c*) the genitive of price) of the (*d*) infinitive and of the (*e*) participles passive (though in each case the forms differ widely in the two groups), and perhaps (*f*) of the dependent moods (though here again the forms have been vigorously reshaped in Italic). These syntactic parallels, which are hardly noticed by Kretschmer in his otherwise careful discussion (*Einleit.* p. 155 seq.), serve to confirm his general conclusion which has been here adopted; because syntactic peculiarities have a long life and may survive not merely complete revolutions in morphology, but even a complete change in the speaker's language, *e.g.* such Celticisms in Irish-English as "What are you after doing?" for "What have you done?" or in Welsh-English as "whatever" for "anyhow." A few isolated correspondences in vocabulary, as in *remus* from **ret-s-mo-*, with ἐρετμός and in a few plant-names (*e.g.* πράσον and *porrum*), cannot disturb the general conclusion, though no doubt they have some historical significance, if it could be determined.



7. *Indo-Iranian and Italo-Celtic.*—Only a brief reference can here be made to the striking list of resemblances between the Indo-Iranian and Italo-Celtic groups, especially in vocabulary, which Kretschmer has collected (*ibid.* pp. 126-144). The most striking of these are *rēx*, O. Ir. *rīg-*, Sans. *rāj-*, and the political meaning of the same root in the corresponding verb in both languages (contrast *regere* with the merely physical meaning of Gr. ὀρέγνυμι); Lat. *flāmen* (for **flag-men*) exactly = Sans. *brahman-* (neuter), meaning probably "sacrificing," "worshipping," and then "priesthood," "priest," from the Ind.-Eur. root **bhelgh-*, "blaze," "make to blaze"; *rēs*, *rem* exactly = Sans. *rās*, *rām* in declension and especially in meaning; and *Ārio-*, "noble," in Gallic *Ariomanus*, &c., = Sans. *ārya-*, "noble" (whence "Aryan"). So *argentum* exactly = Sans. *rajata-*, Zend *erezata-*; contrast the different (though morphologically kindred) suffix in Gr. ἄργυρος. Some forty-two other Latin or Celtic words (among them *crēdere*, *caesariēs*, *probus*, *castus* (cf. Osc. *kasit*, Lat. *caret*, Sans. *šišṭa-*), *Volcānus*, *Neptūnus*, *ensis*, *erus*, *pruina*, *rūs*, *novācula*) have precise Sanskrit or Iranian equivalents, and none so near in any other of the eight groups of languages. Finally the use of an *-r* suffix in the third plural is common to both Italo-Celtic (see above) and Indo-Iranian. These things clearly point to a fairly close, and probably in part political, intercourse between the two communities of speakers at some early epoch. A shorter, but interesting, list of correspondences in vocabulary with Balto-Slavonic (*e.g.* the words *mentīrī*, *rōs*, *ignis* have close equivalents in Balto-Slavonic) suggests that at the same period the precursor of this dialect too was a not remote neighbour.

8. *Date of the Separation of the Italic Group.*—The date at which the Italic group of languages began to have (so far as it had at all) a separate development of its own is at present only a matter of conjecture. But the combination of archaeological and linguistic research which has already begun can have no more interesting object than the approximate determination of this date (or group of dates); for it will give us a point of cardinal importance in the early history of Europe. The only consideration which can here be offered as a starting-point for the inquiry is the chronological relation of the Etruscan invasion, which is probably referable to the 12th century B.C. (see Etruria), to the two strata of Indo-European population—the -CO- folk (*Falisci*, *Marruci*, *Volsci*, *Hernici* and others), to whom the Tuscan invaders owe the names *Etrusci* and *Tusci*, and the -NO- folk, who, on the West coast, in the centre and south of Italy, appear at a distinctly later epoch, in some places (as in the Bruttian peninsula, see Bruttii) only at the beginning of our historical record. If the view of Latin as mainly the tongue of the -CO- folk prove to be correct (see Rome: *History*; Italy: *Ancient Languages and Peoples*; Sabini; Volsci) we must regard it (*a*) as the southern or earlier half of the Italic group, firmly rooted in Italy in the 12th century B.C., but (*b*) by no means yet isolated from contact with the northern or later half; such is at least the suggestion of the striking peculiarities in morphology which it shares with not merely Oscan and Umbrian, but also, as we have seen, with Celtic. The progress in time of this isolation ought before long to be traced with some approach to certainty.

9. We may now proceed to notice the chief changes that arose in Latin after the (more or less) complete separation of the Italic group whenever it came about. The contrasted features of Oscan and Umbrian, to some of which, for special reasons, occasional reference will be here made, are fully described under OSCA LINGUA and IGUVIUM respectively.

It is rarely possible to fix with any precision the date at which a particular change began or was completed, and the most serviceable form for this conspectus of the development will be to present, under the heads of Phonology, Morphology and Syntax, the chief characteristics of Ciceronian Latin which we know to have been developed after Latin became a separate language. Which of these changes, if any, can be assigned to a particular period will be seen as we proceed. But it should be remembered that an enormous increase of exact knowledge has accrued from the scientific methods of research introduced by A. Leskien and K. Brugmann in 1879, and finally established by Brugmann's great *Grundriss* in 1886, and that only a brief enumeration can be here attempted. For adequate study reference must be made to the fuller treatises quoted, and especially to the sections bearing on Latin in K. Brugmann's *Kurze vergleichende Grammatik* (1902).

## I. PHONOLOGY

10. *The Latin Accent.*—It will be convenient to begin with some account of the most important discovery made since the application of scientific method to the study of Latin, for, though it is not strictly a part of phonology, it is wrapped up with much of the development both of the sounds and, by consequence, of the inflexions. It has long been observed (as we have seen § 4, iv. above) that the restriction of the word-accent in Latin to the last three syllables of the word, and its attachment to a long syllable in the penult, were certainly not its earliest traceable condition; between this, the classical system, and the comparative freedom with which the word-accent was placed in pro-ethnic Indo-European, there had intervened a period of first-syllable accentuation to which were due many of the characteristic contractions of Oscan and Umbrian, and in Latin the degradation of the vowels in such forms as *accentus* from *ad* + *cantus* or *praecipitem* from *prae* + *caput-* (§ 19 below). R. von Planta (*Osk.-Umbr. Grammatik*, 1893, i. p. 594) pointed out that in Oscan also, by the 3rd century B.C., this first-syllable-accent had probably given way to a system which limited the word-accent in some such way as in classical Latin. But it remained for C. Exon, in a brilliant article (*Hermathena* (1906), xiv. 117, seq.), to deduce from the more precise stages of the change (which had been gradually noted, see *e.g.* F. Skutsch in Kroll's *Altertumswissenschaft im letzten Vierteljahrhundert*, 1905) their actual effect on the language.

11. *Accent in Time of Plautus.*—The rules which have been established for the position of the accent in the time of Plautus are these:

(i.) The quantity of the final syllable had no effect on accent.

(ii.) If the penult was long, it bore the accent (*amābā́mus*).

(iii.) If the penult was short, then

(*a*) if the ante-penult was long, it bore the accent (*amā́bimus*);

(*b*) if the ante-penult was short, then

(i.) if the ante-ante-penult was long, the accent was on the ante-penult (*amīcítia*); but

(ii.) if the ante-ante-penult was also short, it bore the accent (*cólumine, puéritia*).

*Exon's Laws of Syncope.*—With these facts are now linked what may be called Exon's Laws, viz:—

*In pre-Plautine Latin* in all words or word-groups of four or more syllables whose chief accent is on one long syllable, a short unaccented medial vowel was syncopated; thus **quínquedecem* became **quínqdecem* and thence *quíndecim* (for the *-im* see § 19), **súps-emere* became **súpsmere* and that *sūmere* (on *-psm- v. inf.*) **súrregere*, **surregēmus*, and the like became *surgere*, *surgēmus*, and the rest of the paradigm followed; so probably *validē bonus* became *valdē bonus*, *extrā viam* became *extrā viam*; so **supo-téndo* became *subtendo* (pronounced *sup-tendo*), **āridēre*, **avidēre* (from *āridus*, *avidus*) became *ārdēre*, *audēre*. But the influence of cognate forms often interfered; *posterī-diē* became *postrídiē*, but in *posterōrum*, *posterārum* the short syllable was restored by the influence of the trisyllabic cases, *pósterus*, *pósterī*, &c., to which the law did not apply. Conversely, the nom. **āridor* (more correctly at this period **āridōs*), which would not have been contracted,

followed the form of *ārdō̆rem* (from **āridō̆rem*), *ārdē̆re*, &c.

The same change produced the monosyllabic forms *nec*, *ac*, *neu*, *seu*, from *neque*, &c., before consonants, since they had no accent of their own, but were always pronounced in one breath with the following word, *neque tántum* becoming *nec tantum*, and the like. So in Plautus (and probably always in spoken Latin) the words *nemp*(*e*), *ind*(*e*), *quipp*(*e*), *ill*(*e*), are regularly monosyllables.

12. *Syncope of Final Syllables.*—It is possible that the frequent but far from universal syncope of final syllables in Latin (especially before *-s*, as in *mēns*, which represents both Gr. μένος and Sans. matís = Ind.-Eur. *mn̥tís*, Eng. *mind*) is due also to this law operating on such combinations as *bona mēns* and the like, but this has not yet been clearly shown. In any case the effects of any such phonetic change have been very greatly modified by analogical changes. The Oscan and Umbrian syncope of short vowels before final *s* seems to be an independent change, at all events in its detailed working. The outbreak of the unconscious affection of slurring final syllables may have been contemporaneous. 247

13. *In post-Plautine Latin* words accented on the ante-antepenult:—

(i.) suffered syncope in the short syllable following the accented syllable (*bálineae* became *bálneae*, *puéritia* became *puértia* (Horace), *cólumine*, *tégimine*, &c., became *cúlmine*, *tégmine*, &c., beside the trisyllabic *cólumen*, *tégimen*) unless

(ii.) that short vowel was *e* or *i*, followed by another vowel (as in *párietem*, *múlierem*, *Púteoli*), when, instead of contraction, the accent shifted to the penult, which at a later stage of the language became lengthened, *pariétem* giving Ital. *paréête*, Fr. *paroi*, *Puteóli* giving Ital. *Pozzuóli*.

The restriction of the accent to the last three syllables was completed by these changes, which did away with all the cases in which it had stood on the fourth syllable.

14. *The Law of the Brevis Brevians.*—Next must be mentioned another great phonetic change, also dependent upon accent, which had come about before the time of Plautus, the law long known to students as the *Brevis Brevians*, which may be stated as follows (Exon, *Hermathena* (1903), xii. 491, following Skutsch in, *e.g.*, Vollmöller's *Jahresbericht für romanische Sprachwissenschaft*, i. 33): a syllable long by nature or position, and preceded by a short syllable, was itself shortened if the word-accent fell immediately before or immediately after it—that is, on the preceding short syllable or on the next following syllable. The sequence of syllables need not be in the same word, but must be as closely connected in utterance as if it were. Thus *mŏ́dō* became *módŏ*, *vŏ̆lūptā́tēm* became *vŏ̆lŭ(p)tā́tem*, *quī́d ēst?* became *quid ĕst?* either the *s* or the *t* or both being but faintly pronounced.

It is clear that a great number of flexional syllables so shortened would have their quantity immediately restored by the analogy of the same inflexion occurring in words not of this particular shape; thus, for instance, the long vowel of *ā́mā* and the like is due to that in other verbs (*pulsā*, *agitā*) not of iambic shape. So ablatives like *modŏ*, *sonō* get back their *-ō*, while in particles like *modo*, "only," *quōmodo*, "how," the shortened form remains. Conversely, the shortening of the final *-a* in the nom. sing. fem. of the *a*-declension (contrast *lūnă* with Gr. χωρᾷ) was probably partly due to the influence of common forms like *eă*, *bonă*, *mală*, which had come under the law.

15. *Effect on Verb Inflexion.*—These processes had far-reaching effects on Latin inflexion. The chief of these was the creation of the type of conjugation known as the *capio*-class. All these verbs were originally inflected like *audio*, but the accident of their short root-syllable, (in such early forms as **fúgīs*, **fugītŭ́rus*, **fugīsĕ́tis*, &c., becoming later *fúgĭs*, *fugĭtŭ́rus*, *fugĕrĕ́tis*) brought great parts of their paradigm under this law, and the rest followed suit; but true forms like *fugīre*, *cupīre*, *morīri*, never altogether died out of the spoken language. St Augustine, for instance, confessed in 387 A.D. (*Epist.* iii. 5, quoted by Exon, *Hermathena* (1901), xi. 383,) that he does not know whether *cupi* or *cupiri* is the pass. inf. of *cupio*. Hence we have Ital. *fuggīre*, *morīre*, Fr. *fuir*, *mourir*. (See further on this conjugation, C. Exon, *l.c.*, and F. Skutsch, *Archiv für lat. Lexicographie*, xii. 210, two papers which were written independently.)

16. The question has been raised how far the true phonetic shortening appears in Plautus, produced not by word-accent but by metrical ictus—*e.g.* whether the reading is to be trusted in such lines as *Amph.* 761, which gives us *dedisse* as the first foot (tribrach) of a trochaic line "because the metrical ictus fell on the syllable *ded-*"—but this remarkable theory cannot be discussed here. See the articles cited and also F. Skutsch, *Forschungen zu Latein. Grammatik und Metrik*, i. (1892); C. Exon, *Hermathena* (1903) xii. p. 492, W. M. Lindsay, *Captivi* (1900), appendix.

In the history of the vowels and diphthongs in Latin we must distinguish the changes which came about independently of accent and those produced by the preponderance of accent in another syllable.

17. *Vowel Changes independent of Accent.*—In the former category the following are those of chief importance:—

(i.) *ĭ* became *ĕ* (*a*) when final, as in *ant-e* beside Gr. ἀντί, *trīste* besides *trīsti-s*, contrasted with *e.g.*, the Greek neuter ἴδρι (the final *-e* of the infinitive—*regere*, &c.—is the *-ĭ* of the locative, just as in the so-called ablatives *genere*, &c.); (*b*) before *-r-* which has arisen from *-s-*, as in *cineris* beside *cinis*, *cinisculus*; *serō* beside Gr. ἴ(σ)ημι (Ind.-Eur. **si-sēmi*, a reduplicated non-thematic present).

(ii.) Final *ŏ* became *ĕ*; imperative *sequere* = Gr. ἕπε(σ)ο; Lat. *ille* may contain the old pronoun **so*, "he," Gr. ὁ, Sans. *sa* (otherwise Skutsch, *Glotta*, i. Hefte 2-3).

(iii.) *el* became *ol* when followed by any sound save *e*, *i* or *l*, as in *volō*, *volt* beside *velle*; *colō* beside Gr. τέλλομαι, πολεῖν, Att. τέλος; *colōnus* for **quelōnus*, beside *inquilīnus* for **en-quēlenus*.

(iv.) *e* became *i* (i.) before a nasal followed by a palatal or velar consonant (*tingo*, Gr. τέγγω; *in-cipio* from **en-capio*); (ii.) under certain conditions not yet precisely defined, one of which was *i* in a following syllable (*nihil*, *nisi*, *initium*). From these forms *in-* spread and banished *en-*, the earlier form.

(v.) The "neutral vowel" ("schwa Indo-Germanicum") which arose in pro-ethnic Indo-European from the reduction of long *ā*, *ē* or *ō* in unaccented syllables (as in the *-tós* participles of such roots as *stā-*, *dhē-*, *dō-*, **stətós*, **dhətós*, **dətós*) became *a* in Latin (*status con-ditus* [from **con-dhatos*], *datus*), and it is the same sound which is represented by *a* in most of the forms of *dō* (*damus*, *dabō*, &c.).

(vi.) When a long vowel came to stand before another vowel in the same word through loss of *i̯* or *u̯*, it was always shortened; thus the *-eō* of intransitive verbs like *candeō*, *caleō* is for *-ēi̯ō* (where the *ē* is identical with the η in Gr. ἐφάνην, ἐμάνμν) and was thus confused with the causative *-eiō* (as in *moneō*, "I make to think," &c.), where the short *e* is original. So *audīuī* became *audīī* and thence *audiī* (the form audīvī would have disappeared altogether but for being restored from *audīveram*, &c.; conversely *audieram* is formed from *audiī*). In certain cases the vowels contracted, as in *trēs*, *partēs*, &c. with *-ēs* from *ei̯es*, **amō* from *amā(i̯)ō*.

18. *Of the Diphthongs.*

**Changes of the diphthongs independent of accent.**

(vii.) *eu* became *ou* in pro-ethnic Italic, Lat. *novus*: Gr. νέος, Lat. *novem*, Umb. *nuviper* (*i.e. noviper*), "usque ad noviens": Gr. (ἐν-)νέα; in unaccented syllables this *-ov-* sank to *-u(v)-* as in *dēnuō* from *dē novō*, *suus* (which is rarely anything but an enclitic word), Old Lat. *sovos*: Gr. ἑ(ϝ)ός.

(viii.) *ou*, whether original or from *eu*, when in one syllable became *-ū-*, probably about 200 B.C., as in *dūcō*, Old Lat. *doucō*, Goth, *tiuhan*, Eng. *tow*, Ind.-Eur. **deu̯cō*.

(ix.) *ei* became *ī* (as in *dīcō*, Old Lat. *deico*: Gr. δείκ-νυμι, *fīdo*: Gr. πείθομαι, Ind.-Eur. **bheidhō*) just before the time of Lucilius, who prescribes the spellings *puerei* (nom. plur.) but *puerī* (gen. sing.), which indicates that the two forms were pronounced alike in his time, but that the traditional distinction in spelling had been more or less preserved. But after his time, since the sound of *ei* was merely that of *ī*, *ei* is continually used merely to denote a long *ī*, even where, as in *faxeis* for faxīs, there never had been any diphthongal sound at all.

(x.) In rustic Latin (Volscian and Sabine) *au* became *ō* as in the vulgar terms *explōdere*, *plōstrum*. Hence arose interesting doublets of meaning;—*lautus* (the Roman form), "elegant," but *lōtus*, "washed"; *haustus*, "draught," but *hōstus* (Cato), "the season's yield of fruit."

(xi.) *oi* became *oe* and thence *ū* some time after Plautus, as in *ūnus*, Old Lat. *oenus*: Gr. οἰνή "ace." In Plautus the forms have nearly all been modernized, save in special cases, *e.g.* in *Trin.* i. 1, 2, *immoene facinus*, "a thankless task," has not been changed to *immune* because that meaning had died out of the adjective so that *immune facinus* would have made nonsense; but at the end of the same line *utile* has replaced *oetile*. Similarly in a small group of words the old form was preserved through their frequent use in legal or religious documents where tradition was strictly preserved—*poena*, *foedus* (neut.), *foedus* (adj.), "ill-omened." So the archaic and poetical *moenia*, "ramparts," beside the true classical form *mūnia*, "duties"; the historic *Poeni* beside the living and frequently used *Pūnicum* (*bellum*)—an example which demonstrates conclusively (*pace* Sommer) that the variation between *ū*

and *oe* is not due to any difference in the surrounding sounds.

(xii.) *ai* became *ae* and this in rustic and later Latin (2nd or 3rd century A.D.) simple *ē*, though of an open quality—Gr. αἴθος, αἴθω, Lat. *aedēs* (originally "the place for the fire"); the country forms of *haedus*, *praetor* were *edus*, *pretor* (Varro, *Ling. Lat.* v. 97, Lindsay, *Lat. Lang.* p. 44).

19. *Vowels and Diphthongs in unaccented Syllables.*—The changes of the short vowels and of the diphthongs in unaccented syllables are too numerous and complex to be set forth here. Some took place under the first-syllable system of accent, some later (§§ 9, 10). Typical examples are *pep*E*rci* from **péparcai* and *ónustus* from **ónostos* (before two consonants); *concI*n*o* from **cóncano* and *hospI*t̄*s* from **hóstipotes*, *legI*m*us* beside Gr. λέγομεν (before one consonant); *Sic*U*li* from **Siceloi* (before a thick *l*, see § 17, 3); *dil*l*gI*t from **dísleget* (contrast, however, the preservation of the second *e* in *negl*E*gI*t); *occ*U*pat* from **opcapat* (contrast *accipit* with *i* in the following syllable); the varying spelling in *monumentum* and *monimentum*, *maxumus* and *maximus*, points to an intermediate sound (*ü*) between *u* and *i* (cf. Quint. i. 4. 8, reading *optumum* and *optimum* [not *opimum*] with W. M. Lindsay, *Latin Language* §§ 14, 16, seq.), which could not be correctly represented in spelling; this difference may, however, be due merely to the effect of differences in the neighbouring sounds, an effect greatly obscured by analogical influences.

Inscriptions of the 4th or 3rd century, B.C. which show original *-es* and *-os* in final syllables (*e.g. Venerĕs*, gen. sing., *nāvebos* abl. pl.) compared with the usual forms in *-is*, *-us* a century later, give us roughly the date of these changes. But final *-os*, *-om*, remained after *-u-* (and *v*) down to 50 B.C. as in *servos*.

20. Special mention should be made of the change of *-rĭ-* and *-ro-* to *-er-* (*incertus* from **encritos*; *ager*, *ācer* from **agros*, **ācris*; the feminine *ācris* was restored in Latin (though not in North Oscan) by the analogy of other adjectives, like *tristis*, while the masculine *ācer* was protected by the parallel masculine forms of the *-o-* declension, like *tener*, *niger* [from **teneros*, **nigros*]). 

21. Long vowels generally remained unchanged, as in *compāgo*, *condōno*.

22. Of the diphthongs, *ai* and *oi* both sank to *ei*, and with original *ei* further to *ī*, in unaccented syllables, as in *Achivi* from Gr. Ἀχαιϝοί, *olīivom*, earlier **oleivom* (borrowed into Gothic and there becoming *alēv*) from Gr. ἔλαιϝον. This gives us interesting chronological data, since the *el-* must have changed to *ol-* (§ 16. 3) before the change of *-ai-* to *-ei-*, and that before the change of the accent from the first syllable to the penultimate (§ 9); and the borrowing took place after *-ai-* had become *-ei-*, but before *-eivom* had become *-eum*, as it regularly did before the time of Plautus.

But cases of *ai*, *ae*, which arose later than the change to *ei*, *ī*, were unaffected by it; thus the nom. plur. of the first declension originally ended in *-ās* (as in Oscan), but was changed at some period before Plautus to *-ae* by the influence of the pronominal nom. plur. ending *-ae* in *quae*? *hae*, &c., which was accented in these monosyllables and had therefore been preserved. The history of the *-ae* of the dative, genitive and locative is hardly yet clear (see Exon, *Hermathena* (1905), xiii. 555; K. Brugmann, *Grundriss*, 1st ed. ii. 571, 601).

The diphthongs *au*, *ou* in unaccented syllables sank to *-u-*, as in *inclūdō* beside *claudō*; the form *clūdō*, taken from the compounds, superseded *claudo* altogether after Cicero's time. So *cūdō*, taken from *incūdō*, *excūdō*, banished the older **caudō*, "I cut, strike," with which is probably connected *cauda*, "the striking member, tail," and from which comes *caussa*, "a cutting, decision, legal case," whose *-ss-* shows that it is derived from a root ending in a dental (see §25 (*b*) below and Conway, *Verner's Law in Italy*, p. 72).

*Consonants.*—Passing now to the chief changes of the consonants we may notice the following points:—

23. Consonant *i* (wrongly written *j*; there is no *g*-sound in the letter), conveniently written *i̯* by phoneticians,

(i.) was lost between vowels, as in *trēs* for **treɨes*, &c. (§ 17. 6);

(ii.) in combination: *-mi̯-* became *-ni-*, as in *veniō*, from Ind.-Eur. *ǵu̯ *mi̯o*, "I come," Sans. *gam-*, Eng. *come*; *-ni̯-* probably (under certain conditions at least) became *-nd-*, as in *tendō* beside Gr. τείνω, *fendō* = Gr. θείνω, and in the gerundive stem *-endus*, *-undus*, probably for *-eni̯os*, *-oni̯os*; cf. the Sanskrit gerundive in *-an-īya-s*; *-gi̯-*, *-di̯-* became *-i̯-* as in *māior* from **mag-ior*, *pēior* from **ped-ior*;

(iii.) otherwise *-i̯-* after a consonant became generally syllabic (*-ii̯-*), as in *capiō* (trisyllabic) beside Goth. *hafya*.

24. Consonant *u* (formerly represented by English *v*), conveniently written *u̯*,

(i.) was lost between similar vowels when the first was accented, as in *audīui*, which became *audiī* (§ 17 [6]), but not in *amāuī*, nor in *avārus*.

(ii.) in combination: $d^{u}$ became *b*, as in *bonus*, *bellum*, O. Lat. $d^{u}$*onus*, *$d^{u}$*ellum* (though the poets finding this written form in old literary sources treated it as trisyllabic); $p^{u}$-, $f^{u}$-, $b^{u}$-, lost the $^{u}$, as in *ap-erio*, *op-erio* beside Lith. -*veriu*, "I open," Osc. *veru*, "gate," and in the verbal endings -*bam*, -*bō*, from -$bh^{u}$-*ām*, -$bh^{u}$*ō* (with the root of Lat. *fui*), and *fīo*, *du-bius*, *super-bus*, *vasta-bundus*, &c., from the same; -$s^{u}$- between vowels (at least when the second was accented) disappeared (see below § 25 (*a*), iv.), as in *pruīna* for *prusuīna*, cf. Eng. *fros-t*, Sans, *pruṣvā*, "hoar-frost." Contrast *Minérva* from an earlier **menes-*$^{u}$*ā*, $s^{u}$*e-*, $s^{u}$*o-*, both became so-, as in *sorōor*(*em*) beside Sans. *svasār-am*, Ger. *schwes-t-er*, Eng. *sister*, *sordēs*, beside O. Ger. *swart-s*, mod. *schwarz*. -$^{u}$*o-* in final syllables became -*u-*, as in *cum* from *quom*, *parum* from *par*$^{u}$*om*; but in the declensional forms -$^{u}$*u-* was commonly restored by the analogy of the other cases, thus (*a*) *ser*$^{u}$*os*, *ser*$^{u}$*om*, *ser*$^{u}$*ī* became (*b*) **serus*, **serum*, **ser*$^{u}$*i*, but finally (*c*) *ser*$^{u}$*us*, *ser*$^{u}$*um*, *ser*$^{u}$*i*.

(iii.) In the 2nd century A.D., Lat. *v* (*i.e.* $^{u}$) had become a voiced labio-dental fricative, like Eng. *v*; and the voiced labial plosive *b* had broken down (at least in certain positions) into the same sound; hence they are frequently confused as in spellings like *vene* for *bene*, *Bictorinus* for *Victorinus*.

25. (*a*) Latin *s*

(i.) became *r* between vowels between 450 and 350 B.C. (for the date see R. S. Conway, *Verner's Law in Italy*, pp. 61-64), as *āra*, beside O. Lat. *āsa*, *generis* from **geneses*, Gr. γένεος; *eram*, *erō* for **esām*, **esō*, and so in the verbal endings -*erām*, -*erō*, -*erim*. But a considerable number of words came into Latin, partly from neighbouring dialects, with -*s-* between vowels, after 350 B.C., when the change ceased, and so show -*s-*, as *rosa* (probably from S. Oscan for **rodi̯a* "rose-bush" cf. Gr. ῥόδον), *cāseus*, "cheese," *miser*, a term of abuse, beside Gr. μυσαρός (probably also borrowed from south Italy), and many more, especially the participles in -*sus* (*fūsus*), where the -*s-* was -*ss-* at the time of the change of -*s-* to -*r-* (so in *causa*, see above). All attempts to explain the retention of the -*s-* otherwise must be said to have failed (*e.g.* the theory of accentual difference in *Verner's Law in Italy*, or that of dissimilation, given by Brugmann, *Kurze vergl. Gram.* p. 242).

(ii.) *sr* became *þr* (= Eng. *thr* in *throw*) in pro-ethnic Italic, and this became initially *fr-* as in *frīgus*, Gr. ῥῖγος (Ind.-Eur. **srīgos*), but medially -*br-*, as in *funebris*, from *funus*, stem *funes-*.

(iii.) -*rs-*, *ls-* became -*rr-*, -*ll-*, as in *ferre*, *velle*, for **fer-se*, **vel-se* (cf. *es-se*).

(iv.) Before *m*, *n*, *l*, and *v*, -*s-* vanished, having previously caused the loss of any preceding plosive or -*n-*, and the preceding vowel, if short, was lengthened as in

*prīmus* from **prismos*, Paelig. *prismu*, "prima," beside *pris-cus*.

*iūmentum* from O. Lat. *iouxmentum*, older **ieugsmentom*; cf. Gr. ζεῦγμα, ζύγον, Lat. *iugum*, *iungo*.

*lūna* from **leucsnā-*, Praenest, *losna*, Zend *raoχsna-*; cf. Gr. λεῦκος, "white-ness" neut. *e.g.* λευκός, "white," Lat. *lūceō*.

*tēlum* from **tēns-lom* or **tends-lom*, *trānāre* from **trāns-nāre*.

*sēvirī* from **sex-virī*, *ēvehō* from **ex-vehō*, and so *ē-mittō*, *ē-līdō*, *ē-numerō*, and from these forms arose the proposition *ē* instead of *ex*.

(v.) Similarly -*sd-* became -*d-*, as in *īdem* from *is-dem*.

(vi.) Before *n-*, *m-*, *l-*, initially *s-* disappeared, as in *nūbo* beside Old Church Slavonic *snubiti*, "to love, pay court to"; *mīror* beside Sans, *smáyatē*, "laughs," Eng. *smi-le*; *lūbricus* beside Goth, *sliupan*, Eng. *slip*.

(*b*) Latin -*ss-* arose from an original -*t* + *t-*, -*d* + *t-*, -*dh* + *t-* (except before -*r*), as in *missus*, earlier **mit-tos*; *tōnsus*, earlier **tond-tos*, but *tonstrīx* from **tond-trīx*. After long vowels this -*ss-* became a single -*s-* some time before Cicero (who wrote *caussa* [see above], *divissio*, &c., but probably only pronounced them with -*s-*, since the -*ss-* came to be written single directly after his time).

26. Of the Indo-European velars the breathed *q* was usually preserved in Latin with a labial addition of -$^{u}$- (as in *sequor*, Gr. ἕπομαι, Goth, *saihvan*, Eng. *see*; *quod*, Gr. ποδ-(απός), Eng. *what*); but the voiced $g_{\text{u}}$ remained (as -*gu-*) only after -*n-* (*unguo* beside Ir. *imb*, "butter") and (as *g*) before *r*, *l*, and *u* (as in *gravis*, Gr. βαρύς; *glans*, Gr. βάλανος; *legūmen*, Gr. λοβός, λεβίνθος). Elsewhere it became *v*, as in *veniō* (see § 23, ii.), *nūdus* from **novedos*,

Eng. *naked*. Hence *bōs* (Sans. *gāus*, Eng. *cow*) must be regarded as a farmer's word borrowed from one of the country dialects (*e.g.* Sabine); the pure Latin would be **vōs*, and its oblique cases, *e.g.* acc. **vovem*, would be inconveniently close in sound to the word for sheep *ovem*.

27. The treatment of the Indo-European voiced aspirates (*bh*, *dh*, *ḡh* *ƨh*) in Latin is one of the most marked characteristics of the language, which separates it from all the other Italic dialects, since the fricative sounds, which represented the Indo-European aspirates in pro-ethnic Italic, remained fricatives medially if they remained at all in that position in Oscan and Umbrian, whereas in Latin they were nearly always changed into voiced explosives. Thus—

Ind.-Eur. *bh*: initially Lat. *f-* (*ferō*; Gr. φέρω).

medially Lat. *-b-* (*tibi*; Umb. *tefe*; Sans, *tubhy-*(*am*), "to thee"; the same suffix in Gr. βίη-φι, &c.).

Ind.-Eur. *dh*: initially Lat. *f-* (*fa-c-ere*, *fē-c-ī*; Gr. θετός (instead of *θατός), ἔθη-κα).

medially *-d-* (*medius*; Osc. *mefio-*; Gr. μέσσος, μέσος from *μεθιος); except after *u* (*iubēre* beside *iussus* for **i̯udh-tos*; Sans. *yṓdhati*, "rouses to battle"); before *l* (*stabulum*, but Umb. *staflo-*, with the suffix of Gr. οτέργηθρον, &c.); before or after *r* (*verbum*: Umb. *verfale*: Eng. *word*. Lat. *glaber* [v. inf].: Ger. *glatt*: Eng. *glad*).

Ind.-Eur. *ḡh*: initially *h-* (*humī*: Gr. χαμαί); except before *-u-* (*fundo*: Gr. χέ(ϝ)ω, χύτρα).

medially *-h-* (*veho*: Gr. ἔχω, ὄχος; cf. Eng. *wagon*); except after *-n-* (*fingere*: Osc. *feiho-*, "wall": Gr. θιγγάνω: Ind.-Eur. *dheiĝh-*, *dhinĝh-*); and before *l* (*fīg(u)lus*, from the same root).

Ind.-Eur *gu̯h*: initially *f-* (*formus* and *furnus*, "oven", Gr. θερμός, θέρμη, cf. Ligurian *Bormiō*, "a place with hot springs," *Bormanus*, "a god of hot springs"; *fendō*: Gr. θείνω, φόνος, πρόσ-φατος).

medially *v*, *-gu-* or *-g-* just as Ind.-Eur. ƨu̯ (*ninguere*, *nivem* beside Gr. νίφα, νείφει; *frāgrāre* beside Gr. ὀσφραίνομαι [ὀσ- for *ods-*, cf. Lat. *odor*], a reduplicated verb from a root *ƨu̯hra-*).

For the "non-labializing velars" (H*ostis*, *con*G*ius*, G*laber*) reference must be made to the fuller accounts in the handbooks.

28. Authorities.—This summary account of the chief points in Latin phonology may serve as an introduction to its principles, and give some insight into the phonetic character of the language. For systematic study reference must be made to the standard books, Karl Brugmann, *Grundriss der vergleichenden Grammatik der Indo-Germanischen Sprachen* (vol. i., *Lautlehre*, 2nd ed. Strassburg, 1897; Eng. trans. of ed. 1 by Joseph Wright, Strassburg, 1888) and his *Kurze vergleichende Grammatik* (Strassburg, 1902); these contain still by far the best accounts of Latin; Max Niederman, *Précis de phonétique du Latin* (Paris, 1906), a very convenient handbook, excellently planned; F. Sommer, *Lateinische Laut- und Flexionslehre* (Heidelberg, 1902), containing many new conjectures; W. M. Lindsay, *The Latin Language* (Oxford, 1894), translated into German (with corrections) by Nohl (Leipzig, 1897), a most valuable collection of material, especially from the ancient grammarians, but not always accurate in phonology; F. Stolz, vol. i. of a joint *Historische Grammatik d. lat. Sprache* by Blase, Landgraf, Stolz and others (Leipzig, 1894); Neue-Wagener, *Formenlehre d. lat. Sprache* (3 vols., 3rd ed. Leipzig, 1888, foll.); H. J. Roby's *Latin Grammar* (from Plautus to Suetonius; London, 7th ed., 1896) contains a masterly collection of material, especially in morphology, which is still of great value. W. G. Hale and C. D. Buck's *Latin Grammar* (Boston, 1903), though on a smaller scale, is of very great importance, as it contains the fruit of much independent research on the part of both authors; in the difficult questions of orthography it was, as late as 1907, the only safe guide.



## II. Morphology

In morphology the following are the most characteristic Latin innovations:—

29. *In nouns.*

(i.) The complete loss of the dual number, save for a survival in the dialect of Praeneste (*C.I.L.* xiv. 2891, = Conway, *Ital. Dial.* p. 285, where *Q. k. Cestio Q. f.* seems to be nom. dual); so *C.I.L.* xi. $6706_5$, T. C. Vomanio, see W. Schulze, *Lat. Eigennamen*, p. 117.

(ii.) The introduction of new forms in the gen. sing, of the *-o-* stems (*dominī*), of the *-ā-* stems (*mēnsae*) and in the nom. plural of the same two declensions; innovations mostly

derived from the pronominal declension.

(iii.) The development of an adverbial formation out of what was either an instrumental or a locative of the *-o-* stems, as in *longē*. And here may be added the other adverbial developments, in *-m* (*palam*, *sensim*) probably accusative, and *-iter*, which is simply the accusative of *iter*, "way," crystallized, as is shown especially by the fact that though in the end it attached itself particularly to adjectives of the third declension (*molliter*), it appears also from adjectives of the second declension whose meaning made their combination with *iter* especially natural, such as *longiter*, *firmiter*, *largiter* (cf. English *straightway*, *longways*). The only objections to this derivation which had any real weight (see F. Skutsch, *De nominibus no- suffixi ope formatis*, 1890, pp. 4-7) have been removed by Exon's Law (§ 11), which supplies a clear reason why the contracted type *constanter* arose in and was felt to be proper to Participial adverbs, while *firmiter* and the like set the type for those formed from adjectives.

(iv.) The development of the so-called fifth declension by a re-adjustment of the declension of the nouns formed with the suffix *-iē-*: *ia-* (which appears, for instance, in all the Greek feminine participles, and in a more abstract sense in words like *māteriēs*) to match the inflexion of two old root-nouns *rēs* and *diēs*, the stems of which were originally *rēi̯-* (Sans. *rās*, *rāyas*, cf. Lat. *reor*) and *diēu̯-*.

(v.) The disuse of the *-ti-* suffix in an abstract sense. The great number of nouns which Latin inherited formed with this suffix were either (1) marked as abstract by the addition of the further suffix *-ōn-* (as in *natio* beside the Gr. γνὴσι-ος, &c.) or else (2) confined to a concrete sense; thus *vectis*, properly "a carrying, lifting," came to mean "pole, lever"; *ratis*, properly a "reckoning, devising," came to mean "an (improvised) raft" (contrast *ratiō*); *postis*, a "placing," came to mean "post."

(vi.) The confusion of the consonantal stems with stems ending in *-ĭ-*. This was probably due very largely to the forms assumed through phonetic changes by the gen. sing. and the nom. and acc. plural. Thus at say 300 B.C. the inflexions probably were:

| | conson. stem | *-ĭ-* stem |
|---|---|---|
| Nom. plur. | **rēg-ĕs* | *host-ēs* |
| Acc. plur. | *rĕg-ēs* | *host-īs* |

The confusing difference of signification of the long *-ēs* ending led to a levelling of these and other forms in the two paradigms.

(vii.) The disuse of the *u* declension (Gr. ἡδύς, στάχυς) in adjectives; this group in Latin, thanks to its feminine form (Sans. fem. *svādvī*, "sweet"), was transferred to the *i* declension (*suavis*, *gravis*, *levis*, *dulcis*).

30. *In verbs.*

(i.) The disuse of the distinction between the personal endings of primary and secondary tenses, the *-t* and *-nt*, for instance, being used for the third person singular and plural respectively in all tenses and moods of the active. This change was completed after the archaic period, since we find in the oldest inscriptions *-d* regularly used in the third person singular of past tenses, *e.g. deded*, *feced* in place of the later *dedit*, *fecit*; and since in Oscan the distinction was preserved to the end, both in singular and plural, *e.g. faamat* (perhaps meaning "auctionatur"), but *deded* ("dedit"). It is commonly assumed from the evidence of Greek and Sanskrit (Gr. ἔστι, Sans. *asti* beside Lat. est) that the primary endings in Latin have lost a final *-i*, partly or wholly by some phonetic change.

(ii.) The non-thematic conjugation is almost wholly lost, surviving only in a few forms of very common use, *est*, "is"; *ēst*, "eats"; *volt*, "wills," &c.

(iii.) The complete fusion of the aorist and perfect forms, and in the same tense the fusion of active and middle endings; thus *tutudī*, earlier **tutudai*, is a true middle perfect; *dīxī* is an *s* aorist with the same ending attached; *dīxit* is an aorist active; *tutudisti* is a conflation of perfect and aorist with a middle personal ending.

(iv.) The development of perfects in *-uī* and *-vī*, derived partly from true perfects of roots ending in *v* or *u*, *e.g. mōvī ruī*. For the origin of *monuī* see Exon, *Hermathena* (1901), xi. 396 sq.

(v.) The complete fusion of conjunctive and optative into a single mood, the subjunctive; *regam*, &c., are conjunctive forms, whereas *rexerim*, *rexissem* are certainly and *regerem* most probably optative; the origin of *amem* and the like is still doubtful. Notice, however, that true conjunctive forms were often used as futures, *regēs*, *reget*, &c., and also the simple thematic conjunctive in forms like *erō*, *rexerō*, &c.

(vi.) The development of the future in *-bo* and imperfect in *-bam* by compounding some form of the verb, possibly the Present Participle with forms from the root of *fuī*, **amans-fuo* becoming *amabō*, **amans-fu̯ām* becoming *amābam* at a very early period of Latin; see F. Skutsch, *Atti d. Congresso Storico Intern.* (1903), vol. ii. p. 191.

(vii.) We have already noticed the rise of the passive in *-r* (§ 5 (*d*)). Observe, however, that several middle forms have been pressed into the service, partly because the *-r-* in them which had come from *-s-* seemed to give them a passive colour (*legere* = Gr. λέγε(σ)ο, Attic λέγου). The interesting forms in *-minī* are a confusion of two distinct inflexions, namely, an old infinitive in *-menai*, used for the imperative, and the participial *-menoi*, masculine, *-menai*, feminine, used with the verb "to be" in place of the ordinary inflexions. Since these forms had all come to have the same shape, through phonetic change, their meanings were fused; the imperative forms being restricted to the plural, and the participial forms being restricted to the second person.

31. *Past Participle Passive.*—Next should be mentioned the great development in the use of the participle in *-tos* (*factus*, *fusus*, &c.). This participle was taken with *sum* to form the perfect tenses of the passive, in which, thanks partly to the fusion of perfect and aorist active, a past aorist sense was also evolved. This reacted on the participle itself giving it a prevailingly past colour, but its originally timeless use survives in many places, *e.g.* in the participle *ratus*, which has as a rule no past sense, and more definitely still in such passages as Vergil, *Georg.* i. 206 (*vectis*), *Aen.* vi. 22 (*ductis*), both of which passages demand a present sense. It is to be noticed also that in the earliest Latin, as in Greek and Sanskrit, the *passive* meaning, though the commonest, is not universal. Many traces of this survive in classical Latin, of which the chief are

1. The active meaning of deponent participles, in spite of the fact that some of them (*e.g. adeptus*, *ēmēnsus*, *expertus*) have also a passive sense, and
2. The familiar use of these participles by the Augustan poets with an accusative attached (*galeam indutus*, *traiectus lora*). Here no doubt the use of the Greek middle influenced the Latin poets, but no doubt they thought also that they were reviving an old Latin idiom.

32. *Future Participle.*—Finally may be mentioned together (*a*) the development of the future participle active (in *-ūrus*, never so freely used as the other participles, being rare in the ablative absolute even in Tacitus) from an old infinitive in *-ūrum* ("scio inimicos meos hoc dicturum," C. Gracchus (and others) *apud* Gell. 1. 7, and Priscian ix. 864 (p. 475 Keil), which arose from combining the dative or locative of the verbal noun in *-tu* with an old infinitive *esom* "esse" which survives in Oscan, **dictu esom* becoming *dicturum*. This was discovered by J. P. Postgate (*Class. Review*, v. 301, and *Idg. Forschungen* iv. 252). (*b*) From the same infinitival accusative with the post-position *-dō*, meaning "to," "for," "in" (cf. *quandō* for **quam-do*, and Eng. *to*, Germ, *zu*) was formed the so-called gerund *agen-dō*, "for doing," "in doing," which was taken for a Case, and so gave rise to the accusative and genitive in *-dum* and *-dī*. The form in -dō still lives in Italian as an indeclinable present participle. The modal and purposive meanings of *-dō* appear in the uses of the gerund.

The authorities giving a fuller account of Latin morphology are the same as those cited in § 28 above, save that the reader must consult the second volume of Brugmann's *Grundriss*, which in the English translation (by Conway and Rouse, Strassburg, 1890-1896) is divided into volumes ii, iii. and iv.; and that Niedermann does not deal with morphology.

## III. Syntax

The chief innovations of syntax developed in Latin may now be briefly noted.

33. *In nouns.*

(i.) Latin restricted the various Cases to more sharply defined uses than either Greek or Sanskrit; the free use of the internal accusative in Greek (*e.g.* ἀβρὸν βαίνειν, τυφλὸς τὰ ὦτα) is strange to Latin, save in poetical imitations of Greek; and so is the freedom of the Sanskrit instrumental, which often covers meanings expressed in Latin by *cum*, *ab*, *inter*.

(ii.) The syncretism of the so-called ablative case, which combines the uses of (*a*) the true ablative which ended in *-d* (O. Lat. *praidād*); (*b*) the instrumental sociative (plural forms like *dominīs*, the ending being that of Sans. *çivāiṣ*); and (*c*) the locative (*noct-e*, "at night"; *itiner-e*, "on the road," with the ending of Greek ἐλπίδ-ι). The so-called absolute construction is mainly derived from the second of these, since it is regularly attached fairly closely to the subject of the clause in which it stands, and when accompanied by a passive participle most commonly denotes an action performed by that subject. But the other two sources cannot be altogether excluded (*orto sole*, "starting from sunrise"; *campo patente*, "on, in sight of, the

open plain").

34. *In verbs.*

(i.) The rich development and fine discrimination of the uses of the subjunctive mood, especially (*a*) in indirect questions (based on direct deliberative questions and not fully developed by the time of Plautus, who constantly writes such phrases as *dic quis es* for the Ciceronian *dic quis sis*); (*b*) after the relative of essential definition (*non is sum qui negem*) and the circumstantial *cum* ("at such a time as that"). The two uses (*a*) and (*b*) with (*c*) the common Purpose and Consequence-clauses spring from the "prospective" or "anticipatory" meaning of the mood. (*d*) Observe further its use in subordinate oblique clauses (*irascitur quod abierim*, "he is angry because, *as he asserts*, I went away"). This and all the uses of the mood in oratio obliqua are derived partly from (*a*) and (*b*) and partly from the (*e*) Unreal Jussive of past time (*Non illi argentum redderem? Non redderes*, "Ought I not to have returned the money to him?" "You certainly ought not to have," or, more literally, "You were not to"). 

On this interesting chapter of Latin syntax see W. G. Hale's "Cum-constructions" (*Cornell University Studies in Classical Philology*, No. 1, 1887-1889), and *The Anticipatory Subjunctive* (Chicago, 1894).

(ii.) The complex system of oratio obliqua with the sequence of tenses (on the growth of the latter see Conway, *Livy II.*, Appendix ii., Cambridge, 1901).

(iii.) The curious construction of the gerundive (*ad capiendam urbem*), originally a present (and future?) passive participle, but restricted in its use by being linked with the so-called gerund (see § 32, *b*). The use, but probably not the restriction, appears in Oscan and Umbrian.

(iv.) The favourite use of the impersonal passive has already been mentioned (§ 5, iv.).

35. The chief authorities for the study of Latin syntax are: Brugmann's *Kurze vergl. Grammatik*, vol. ii. (see § 28); Landgraf's *Historische lat. Syntax* (vol. ii. of the joint *Hist. Gram.*, see § 28); Hale and Buck's *Latin Grammar* (see § 28); Draeger's *Historische lat. Syntax*, 2 vols. (2nd ed., Leipzig, 1878-1881), useful but not always trustworthy; the Latin sections in Delbrück's *Vergleichende Syntax*, being the third volume of Brugmann's *Grundriss* (§ 28).

## IV. Importation of Greek Words

36. It is convenient, before proceeding to describe the development of the language in its various epochs, to notice briefly the debt of its vocabulary to Greek, since it affords an indication of the steadily increasing influence of Greek life and literature upon the growth of the younger idiom. Corssen (*Lat. Aussprache*, ii. 814) pointed out four different stages in the process, and though they are by no means sharply divided in time, they do correspond to different degrees and kinds of intercourse.

(*a*) The first represents the period of the early intercourse of Rome with the Greek states, especially with the colonies in the south of Italy and Sicily. To this stage belong many names of nations, countries and towns, as *Siculi*, *Tarentum*, *Graeci*, *Achivi*, *Poenus*; and also names of weights and measures, articles of industry and terms connected with navigation, as *mina*, *talentum*, *purpura*, *patina*, *ancora*, *aplustre*, *nausea*. Words like *amurca*, *scutula*, *pessulus*, *balineum*, *tarpessita* represent familiarity with Greek customs and bear equally the mark of naturalization. To these may be added names of gods or heroes, like *Apollo*, *Pollux* and perhaps *Hercules*. These all became naturalized Latin words and were modified by the phonetic changes which took place in the Latin language after they had come into it (cf. §§ 9-27 *supra*). (*b*) The second stage was probably the result of the closer intercourse resulting from the conquest of southern Italy, and the wars in Sicily, and of the contemporary introduction of imitations of Greek literature into Rome, with its numerous references to Greek life and culture. It is marked by the free use of hybrid forms, whether made by the addition of Latin suffixes to Greek stems as *ballistārius*, *hēpatārius*, *subbasilicānus*, *sȳcophantiōsus*, *cōmissārī* or of Greek suffixes to Latin stems as *plāgipatidas*, *pernōnides*; or by derivation, as *thermopōtāre*, *supparasītāri*; or by composition as *ineuschēmē*, *thyrsigerae*, *flagritribae*, *scrophipascī*. The character of many of these words shows that the comic poets who coined them must have been able to calculate upon a fair knowledge of colloquial Greek on the part of a considerable portion of their audience. The most remarkable instance of this is supplied by the burlesque lines in Plautus (*Pers.* 702 seq.), where Sagaristio describes himself as

Vaniloquidorus, Virginisvendonides,

Nugipiloquides, Argentumexterebronides,
Tedigniloquides, Nummosexpalponides,
Quodsemelarripides, Nunquameripides.

During this period Greek words are still generally inflected according to the Latin usage.

(*c*) But with Accius (see below) begins a third stage, in which the Greek inflexion is frequently preserved, *e.g. Hectora*, *Oresten*, *Cithaeron*; and from this time forward the practice wavers. Cicero generally prefers the Latin case-endings, defending, *e.g.*, *Piraeeum* as against *Piraeea* (*ad Att.* vii. 3, 7), but not without some fluctuation, while Varro takes the opposite side, and prefers *poëmasin* to the Ciceronian *poëmatis*. By this time also *y* and *z* were introduced, and the representation of the Greek aspirates by *th*, *ph*, *ch*, so that words newly borrowed from the Greek could be more faithfully reproduced. This is equally true whatever was the precise nature of the sound which at that period the Greek aspirates had reached in their secular process of change from pure aspirates (as in Eng. *ant-hill*, &c.) to fricatives (like Eng. *th* in *thin*). (See Arnold and Conway, *The Restored Pronunciation of Greek and Latin*, 4th ed., Cambridge, 1908, p. 21.)

(*d*) A fourth stage is marked by the practice of the Augustan poets, who, especially when writing in imitation of Greek originals, freely use the Greek inflexions, such as *Arcadĕs*, *Tethŷ*, *Aegida*, *Echūs*, &c. Horace probably always used the Latin form in his *Satires* and *Epistles*, the Greek in his Odes. Later prose writers for the most part followed the example of his *Odes*. It must be added, however, in regard to these literary borrowings that it is not quite clear whether in this fourth class, and even in the unmodified forms in the preceding class, the words had really any living use in spoken Latin.

## V. Pronunciation

This appears the proper place for a rapid survey of the pronunciation[1] of the Latin language, as spoken in its best days.

37. Consonants.—(i.) *Back palatal.* Breathed plosive *c*, pronounced always as *k* (except that in some early inscriptions—probably none much later, if at all later, than 300 B.C.—the character is used also for *g*) until about the 7th century after Christ. *K* went out of use at an early period, except in a few old abbreviations for words in which it had stood before *a*, *e.g.*, *kal.* for *kalendae*. *Q*, always followed by the consonantal *u*, except in a few old inscriptions, in which it is used for *c* before the vowel *u*, *e.g. pequnia*. *X*, an abbreviation for *cs*; *xs* is, however, sometimes found. Voiced plosive *g*, pronounced as in English *gone*, but never as in English *gem* before about the 6th century after Christ. Aspirate *h*, the rough breathing as in English.

(ii.) *Palatal.*—The consonantal *i*, like the English *y*; it is only in late inscriptions that we find, in spellings like *Zanuario*, *Giove*, any definite indication of a pronunciation like the English *j*. The precise date of the change is difficult to determine (see Lindsay's *Latin Lang.* p. 49), especially as we may, in isolated cases, have before us merely a dialectic variation; see Paeligni.

(iii.) *Lingual.*—*r* as in English, but probably produced more with the point of the tongue. *l* similarly more dental than in English. *s* always breathed (as Eng. *ce* in *ice*). *z*, which is only found in the transcription of Greek words in and after the time of Cicero, as *dz* or *zz*.

(iv.) *Dental.*—Breathed, *t* as in English. Voiced, *d* as in English; but by the end of the 4th century *di* before a vowel was pronounced like our *j* (cf. *diurnal* and *journal*). Nasal, *n* as in English; but also (like the English *n*) a guttural nasal (*ng*) before a guttural. Apparently it was very lightly pronounced, and easily fell away before *s*.

(v.) *Labial.*—Breathed, *p* as in English. Voiced, *b* as in English; but occasionally in inscriptions of the later empire *v* is written for *b*, showing that in some cases *b* had already acquired the fricative sound of the contemporary β (see § 24, iii.). *b* before a sharp *s* was pronounced *p*, *e.g.* in *urbs*. Nasal, *m* as in English, but very slightly pronounced at the end of a word. Spirant, *v* like the *ou* in French *oui*, but later approximating to the *w* heard in some parts of Germany, Ed. Sievers, *Grundzüge d. Phonetik*, ed. 4, p. 117, *i.e.* a labial *v*, not (like the English *v*) a labio-dental *v*.

(vi.) *Labio-dental.*—Breathed fricative, *f* as in English.

38. Vowels.—*ā*, *ū*, *ī*, as the English *ah*, oo, *ee*; *ō*, a sound coming nearer to Eng. *aw* than to Eng. *ō*; *ē* a close Italian *ē*, nearly as the *a* of Eng. *mate*, *ée* of Fr. *passée*. The short sound of the vowels was not always identical in quality with the long sound. *ă* was pronounced as in the French *chatte*, *ŭ* nearly as in Eng. *pull*, *ĭ* nearly as in *pit*, *ŏ* as in *dot*, *ĕ* nearly as in *pet*. The diphthongs were produced by pronouncing in rapid succession the vowels of which they

were composed, according to the above scheme. This gives, *au* somewhat broader than *ou* in house; *eu* like *ow* in the "Yankee" pronunciation of *town*; *ae* like the vowel in *hat* lengthened, with perhaps somewhat more approximation to the *i* in *wine*; *oe*, a diphthongal sound approximating to Eng. *oi*; *ui*, as the French *oui*.

To this it should be added that the Classical Association, acting on the advice of a committee of Latin scholars, has recommended for the diphthongs *ae* and *oe* the pronunciation of English *i* (really *ai*) in *wine* and *oi* in *boil*, sounds which they undoubtedly had in the time of Plautus and probably much later, and which for practical use in teaching have been proved far the best. 251

## VI. The Language As Recorded

39. Passing now to a survey of the condition of the language at various epochs and in the different authors, we find the earliest monument of it yet discovered in a donative inscription on a fibula or brooch found in a tomb of the 7th century B.C. at Praeneste. It runs "Manios med fhefhaked Numasioi," *i.e.* "Manios made me for Numasios." The use of *f* (*fh*) to denote the sound of Latin *f* supplied the explanation of the change of the symbol *f* from its Greek value (= Eng. *w*) to its Latin value *f*, and shows the Chalcidian Greek alphabet in process of adaptation to the needs of Latin (see Writing). The reduplicated perfect, its 3rd sing. ending *-ed*, the dative masculine in *-oi* (this is one of the only two recorded examples in Latin), the *-s-* between vowels (§ 25, 1), and the *-a-* in what was then (see §§ 9, 10) certainly an unaccented syllable and the accusative *med*, are all interesting marks of antiquity.[2]

40. The next oldest fragment of continuous Latin is furnished by a vessel dug up in the valley between the Quirinal and the Viminal early in 1880. The vessel is of a dark brown clay, and consists of three small round pots, the sides of which are connected together. All round this vessel runs an inscription, in three clauses, two nearly continuous, the third written below; the writing is from right to left, and is still clearly legible; the characters include one sign not belonging to the later Latin alphabet, namely ϙ for R, while the M has five strokes and the Q has the form of a Koppa.

The inscription is as follows:—

"iovesat deivos qoi med mitat, nei ted endo cosmis virco sied, asted noisi opetoitesiai pacari vois.

dvenos med feced en manom einom duenoi ne med malo statod."

The general style of the writing and the phonetic peculiarities make it fairly certain that this work must have been produced not later than 300 B.C. Some points in its interpretation are still open to doubt,[3] but the probable interpretation is—

"Deos iurat ille (*or* iurant illi) qui me mittat (*or* mittant) ne in te Virgo (*i.e.* Proserpina) comis sit, nisi quidem optimo (?) Theseae (?) pacari vis. Duenos me fecit contra Manum, Dueno autem ne per me malum stato (= imputetur, imponatur)."

"He (or they) who dispatch me binds the gods (by his offering) that Proserpine shall not be kind to thee unless thou wilt make terms with (or "for") Opetos Thesias (?). Duenos made me against Manus, but let no evil fall to Duenos on my account."

41. Between these two inscriptions lies in point of date the famous stele discovered in the Forum in 1899 (G. Boni, *Notiz. d. scavi*, May 1899). The upper half had been cut off in order to make way for a new pavement or black stone blocks (known to archaeologists as the *niger lapis*) on the site of the comitium, just to the north-east of the Forum in front of the Senate House. The inscription was written lengthwise along the (pyramidal) stele from foot to apex, but with the alternate lines in reverse directions, and one line not on the full face of any one of the four sides, but up a roughly-flattened fifth side made by slightly broadening one of the angles. No single sentence is complete and the mutilated fragments have given rise to a whole literature of conjectural "restorations."

R. S. Conway examined it *in situ* in company with F. Skutsch in 1903 (cf. his article in Vollmöller's *Jahresbericht*, vi. 453), and the only words that can be regarded as reasonably certain are *regei* (*regi*) on face 2, *kalatorem* and *iouxmenta* on face 3, and *iouestod* (*iusto*) on face 4.[4] The date may be said to be fixed by the variation of the sign for *m* between  and  (with  for *r*) and other alphabetic indications which suggest the 5th century B.C. It has been suggested also that the reason for the destruction of the stele and the repavement may have been either (1) the pollution of the comitium by the Gallic invasion of 390 B.C., all traces of which, on their departure, could be best removed by a repaving; or (2) perhaps more

probably, the Augustan restorations (Studniczka, *Jahresheft d. Österr. Institut*, 1903, vi. 129 ff.).

(R. S. C.)

42. Of the earlier long inscriptions the most important would be the *Columna Rostrata*, or column of Gaius Duilius (*q.v.*), erected to commemorate his victory over the Carthaginians in 260 B.C., but for the extent to which it has suffered from the hands of restorers. The shape of the letters plainly shows that the inscription, as we have it, was cut in the time of the empire. Hence Ritschl and Mommsen pointed out that the language was modified at the same time, and that, although many archaisms have been retained, some were falsely introduced, and others replaced by more modern forms. The most noteworthy features in it are—C always written for G (CESET = *gessit*), single for double consonants (*clases-classes*), *d* retained in the ablative (*e.g.*, *in altod marid*), *o* for *u* in inflexions (*primos*, *exfociont* = *exfugiunt*), *e* for *i* (*navebos* = *navibus*, *exemet* = *exemit*); of these the first is probably an affected archaism, G having been introduced some time before the assumed date of the inscription. On the other hand, we have *praeda* where we should have expected *praida*; no final consonants are dropped; and the forms *-es*, *-eis* and *-is* for the accusative plural are interchanged capriciously. The doubts hence arising preclude the possibility of using it with confidence as evidence for the state of the language in the 3rd century B.C.

43. Of unquestionable genuineness and the greatest value are the *Scipionum Elogia*, inscribed on stone coffins, found in the monument of the Scipios outside the Capene gate (*C.I.L.*[1] i. 32). The earliest of the family whose epitaph has been preserved is L. Cornelius Scipio Barbatus (consul 298 B.C.), the latest C. Cornelius Scipio Hispanus (praetor in 139 B.C.); but there are good reasons for believing with Ritschl that the epitaph of the first was not contemporary, but was somewhat later than that of his son (consul 259 B.C.). This last may therefore be taken as the earliest specimen of any length of Latin and it was written at Rome; it runs as follows:—

honcoino . ploirume . cosentiont . r[*omai*]
duonoro . optumo . fuise . uiro [*virorum*]
luciom . scipione . filios . barbati
*co*]nsol . censor . aidilis . hic . fuet a [*pud vos*]
*he*]c . cepit . corsica . aleriaque . urbe[*m*]
*de*]det . tempestatebus . aide . mereto[*d votam*].

The archaisms in this inscription are—(1) the retention of *o* for *u* in the inflexion of both nouns and verbs; (2) the diphthongs *oi* (= later *u*) and *ai* (= later *ae*); (3) *-et* for *-it*, *hec* for *hic*, and *-ebus* for *-ibus*; (4) *duon-* for *bon*; and (5) the dropping of a final *m* in every case except in *Luciom*, a variation which is a marked characteristic of the language of this period.

44. The oldest specimen of the Latin language preserved to us in any literary source is to be found in two fragments of the Carmina Saliaria (Varro, *De ling. Lat.* vii. 26, 27), and one in Terentianus Scaurus, but they are unfortunately so corrupt as to give us little real information (see B. Maurenbrecher, *Carminum Saliarium reliquiae*, Leipzig, 1894; G. Hempl, *American Philol. Assoc. Transactions*, xxxi., 1900, 184). Rather better evidence is supplied in the *Carmen Fratrum Arvalium*, which was found in 1778 engraved on one of the numerous tablets recording the transactions of the college of the Arval brothers, dug up on the site of their grove by the Tiber, 5 m. from the city of Rome; but this also has been so corrupted in its oral tradition that even its general meaning is by no means clear (*C.I.L.*[1] i. 28; Jordan, *Krit. Beiträge*, pp. 203-211).

45. The text of the Twelve Tables (451-450 B.C.), if preserved in its integrity, would have been invaluable as a record of antique Latin; but it is known to us only in quotations. R. Schoell, whose edition and commentary (Leipzig, 1866) is the most complete, notes the following traces, among others, of an archaic syntax: (1) both the subject and the object of the verb are often left to be understood from the context, *e.g. ni it antestamino, igitur, em capito*; (2) the imperative is used even for permissions, “si volet, plus dato,” “if he choose, he may give him more”; (3) the subjunctive is apparently never used in conditional, only in final sentences, but the future perfect is common; (4) the connexion between sentences is of the simplest kind, and conjunctions are rare. There are, of course, numerous isolated archaisms of form and meaning, such as *calvitur*, *pacunt*, *endo*, *escit*. Later and less elaborate editions are contained in *Fontes Iuris Romani*, by Bruns-Mommsen-Gradenwitz (1892); and P. Girard, *Textes de droit romain* (1895).



46. Turning now to the language of literature we may group the Latin authors as follows:—[5]

I. *Ante-Classical* (240-80 B.C.).—Naevius (? 269-204), Plautus (254-184), Ennius (239-169),

Cato the Elder (234-149), Terentius (? 195-159), Pacuvius (220-132), Accius (170-94), Lucilius (? 168-103).

II. *Classical—Golden Age* (80 B.C.-A.D. 14).—Varro (116-28), Cicero (106-44), Lucretius (99-55), Caesar (102-44), Catullus (87-? 47), Sallust (86-34), Virgil (70-19), Horace (65-8), Propertius (? 50- ?), Tibullus (? 54-? 18), Ovid (43 B.C.-A.D. 18), Livy (59 B.C.-A.D. 18).

III. *Classical—Silver Age* (A.D. 14-180).—Velleius (? 19 B.C.-? A.D. 31), M. Seneca (d. *c.* A.D. 30), Persius (34-62), Petronius (d. 66), Lucan (39-65), L. Seneca (d. A.D. 65), Plinius major (23-A.D. 79), Martial (40-101), Quintilian (42-118), Pliny the Younger (61-? 113), Tacitus (? 60-? 118), Juvenal (? 47-? 138), Suetonius (75-160), Fronto (*c.* 90-170).

47. *Naevius and Plautus.*—In Naevius we find archaisms proportionally much more numerous than in Plautus, especially in the retention of the original length of vowels, and early forms of inflexion, such as the genitive in *-as* and the ablative in *-d*. The number of archaic words preserved is perhaps due to the fact that so large a proportion of his fragments have been preserved only by the grammarians, who cited them for the express purpose of explaining these.

Of the language of Plautus important features have already been mentioned (§§ 10-16); for its more general characteristics see PLAUTUS.

48. *Ennius.*—The language of Ennius deserves especial study because of the immense influence which he exerted in fixing the literary style. He first established the rule that in hexameter verse all vowels followed by two consonants (except in the case of a mute and a liquid), or a double consonant, must be treated as lengthened by position. The number of varying quantities is also much diminished, and the elision of final *-m* becomes the rule, though not without exceptions. On the other hand he very commonly retains the original length of verbal terminations (*essēt*, *faciēt*) and of nominatives in *or* and *a*, and elides final *s* before an initial consonant. In declension he never uses *-ae* as the genitive, but *-ai* or *-as*; the older and shorter form of the gen. plur. is *-um* in common; obsolete forms of pronouns are used, as *mis*, *olli*, *sum* (= eum), *sas*, *sos*, *sapsa*; and in verbal inflexion there are old forms like *morīmur* (§ 15), *fūimus* (§ 17, vi.), *potestur* (cf. § 5, iv.). Some experiments in the way of tmesis (*saxo* cere *comminuit*-brum) and apocope (*divum domus altisonum* cael, *replet te laetificum* gau) were happily regarded as failures, and never came into real use. His syntax is simple and straightforward, with the occasional pleonasms of a rude style, and conjunctions are comparatively rare. From this time forward the literary language of Rome parted company with the popular dialect. Even to the classical writers Latin was in a certain sense a dead language. Its vocabulary was not identical with that of ordinary life. Now and again a writer would lend new vigour to his style by phrases and constructions drawn from homely speech. But on the whole, and in ever-increasing measure, the language of literature was the language of the schools, adapted to foreign models. The genuine current of Italian speech is almost lost to view with Plautus and Terence, and reappears clearly only in the semi-barbarous products of the early Romance literature.

49. *Pacuvius, Accius and Lucilius.*—Pacuvius is noteworthy especially for his attempt to introduce a free use of compounds after the fashion of the Greek, which were felt in the classical times to be unsuited to the genius of the Latin language, Quintilian censures severely his line—

Nerei repandirostrum incurvicervicum pecus.

Accius, though probably the greatest of the Roman tragedians, is only preserved in comparatively unimportant fragments. We know that he paid much attention to grammar and orthography; and his language is much more finished than that of Ennius. It shows no marked archaisms of form, unless the infinitive in *-ier* is to be accounted as such.

Lucilius furnishes a specimen of the language of the period, free from the restraints of tragic diction and the imitation of Greek originals. Unfortunately the greater part of his fragments are preserved only by a grammarian whose text is exceptionally corrupt; but they leave no doubt as to the justice of the criticism passed by Horace on his careless and "muddy" diction. The *urbanitas* which is with one accord conceded to him by ancient critics seems to indicate that his style was free from the taint of provincial Latinity, and it may be regarded as reproducing the language of educated circles in ordinary life; the numerous Graecisms and Greek quotations with which it abounds show the familiarity of his readers with the Greek language and literature. Varro ascribes to him the *gracile genus dicendi*, the distinguishing features of which were *venustas* and *subtilitas*. Hence it appears that his numerous archaisms were regarded as in no way inconsistent with grace and precision of diction. But it may be remembered that Varro was himself something of an archaizer, and

also that the grammarians' quotations may bring this aspect too much into prominence. Lucilius shares with the comic poets the use of many plebeian expressions, the love for diminutives, abstract terms and words of abuse; but occasionally he borrows from the more elevated style of Ennius forms like *simitu* (= simul), *noenu* (= non), *facul* (= facile), and the genitive in *-āī*, and he ridicules the contemporary tragedians for their *zetematia*, their high-flown diction and *sesquipedalia verba*, which make the characters talk "not like men but like portents, flying winged snakes." In his ninth book he discusses questions of grammar, and gives some interesting facts as to the tendencies of the language. For instance, when he ridicules a *praetor urbanus* for calling himself *pretor*, we see already the intrusion of the rustic degradation of *ae* into *e*, which afterwards became universal. He shows a great command of technical language, and (partly owing to the nature of the fragments) ἅπαξ λεγόμενα are very numerous.

50. *Cato.*—The treatise of Cato the elder, *De re rustica*, would have afforded invaluable material, but it has unfortunately come down to us in a text greatly modernized, which is more of interest from the point of view of literature than of language. We find in it, however, instances of the accusative with *uti*, of the old imperative *praefamino* and of the fut. sub. *servassis*, *prohibessis* and such interesting subjunctive constructions as *dato bubus bibant omnibus*, "give all the oxen (water) to drink."

51. *Growth of Latin Prose.*—It is unfortunately impossible to trace the growth of Latin prose diction through its several stages with the same clearness as in the case of poetry. The fragments of the earlier Latin prose writers are too scanty for us to be able to say with certainty when and how a formed prose style was created. But the impulse to it was undoubtedly given in the habitual practice of oratory. The earliest orators, like Cato, were distinguished for strong common sense, biting wit and vigorous language, rather than for any graces of style; and probably personal *auctoritas* was of far more account than rhetoric both in the law courts and in the assemblies of the people. The first public speaker, according to Cicero, who aimed at a polished style and elaborate periods was M. Aemilius Lepidus Porcina, in the middle of the 2nd century B.C.[6] On his model the Gracchi and Carbo fashioned themselves, and, if we may judge from the fragments of the orations of C. Gracchus which are preserved, there were few traces of archaism remaining. A more perfect example of the *urbanitas* at which good speakers aimed was supplied by a famous speech of C. Fannius against C. Gracchus, which Cicero considered the best oration of the time. No small part of the *urbanitas* consisted in a correct urban pronunciation; and the standard of this was found in the language of the women of the upper classes, such as Laelia and Cornelia.



In the earliest continuous prose work which remains to us the four books *De Rhetorica ad Herennium*, we find the language already almost indistinguishable from that of Cicero. There has been much discussion as to the authorship of this work, now commonly, without very convincing reasons, ascribed to Q. Cornificius; but, among the numerous arguments which prove that it cannot have been the work of Cicero, none has been adduced of any importance drawn from the character of the language. It is worth while noticing that not only is the style in itself perfectly finished, but the treatment of the subject of style, *elocutio* (iv. 12. 17), shows the pains which had already been given to the question. The writer lays down three chief requisites—(1) *elegantia*, (2) *compositio* and (3) *dignitas*. Under the first come *Latinitas*, a due avoidance of solecisms and barbarisms, and *explanatio*, clearness, the employment of familiar and appropriate expressions. The second demands a proper arrangement; hiatus, alliteration, rhyme, the repetition or displacement of words, and too long sentences are all to be eschewed. Dignity depends upon the selection of language and of sentiments.

52. *Characteristics of Latin Prose.*—Hence we see that by the time of Cicero Latin prose was fully developed. We may, therefore, pause here to notice the characteristic qualities of the language at its most perfect stage. The Latin critics were themselves fully conscious of the broad distinction in character between their own language and the Greek. Seneca dwells upon the stately and dignified movement of the Latin period, and uses for Cicero the happy epithet of *gradarius*. He allows to the Greeks *gratia*, but claims *potentia* for his own countrymen. Quintilian (xii. 10. 27 seq.) concedes to Greek more euphony and variety both of vocalization and of accent; he admits that Latin words are harsher in sound, and often less happily adapted to the expression of varying shades of meaning. But he too claims "power" as the distinguishing mark of his own language. Feeble thought may be carried off by the exquisite harmony and subtleness of Greek diction; his countrymen must aim at fulness and weight of ideas if they are not to be beaten off the field. The Greek authors are like lightly moving skiffs; the Romans spread wider sails and are wafted by stronger breezes;

hence the deeper waters suit them. It is not that the Latin language fails to respond to the calls made upon it. Lucretius and Cicero concur, it is true, in complaints of the poverty of their native language; but this was only because they had had no predecessors in the task of adapting it to philosophic utterance; and the long life of Latin technical terms like *qualitas*, *species*, *genus*, *ratio*, shows how well the need was met when it arose. H. A. J. Munro has said admirably of this very period:—

> "The living Latin for all the higher forms of composition, both prose and verse, was a far nobler language than the living Greek. During the long period of Grecian pre-eminence and literary glory, from Homer to Demosthenes, all the manifold forms of poetry and prose which were invented one after the other were brought to such exquisite perfection that their beauty of form and grace of language were never afterwards rivalled by Latin or any other people. But hardly had Demosthenes and Aristotle ceased to live when that Attic which had been gradually formed into such a noble instrument of thought in the hands of Aristophanes, Euripides, Plato and the orators, and had superseded for general use all the other dialects, became at the same time the language of the civilized world and was stricken with a mortal decay.... Epicurus, who was born in the same year as Menander, writes a harsh jargon that does not deserve to be called a style; and others of whose writings anything is left entire or in fragments, historians and philosophers alike, Polybius, Chrysippus, Philodemus, are little if any better. When Cicero deigns to translate any of their sentences, see what grace and life he instils into their clumsily expressed thoughts, how satisfying to the ear and taste are the periods of Livy when he is putting into Latin the heavy and uncouth clauses of Polybius! This may explain what Cicero means when at one time he gives to Greek the preference over Latin, at another to Latin over Greek; in reading Sophocles or Plato he could acknowledge their unrivalled excellence; in translating Panaetius or Philodemus he would feel his own immeasurable superiority."

The greater number of long syllables, combined with the paucity of diphthongs and the consequent monotony of vocalization, and the uniformity of the accent, lent a weight and dignity of movement to the language which well suited the national *gravitas*. The precision of grammatical rules and the entire absence of dialectic forms from the written literature contributed to maintain the character of unity which marked the Roman republic as compared with the multiplicity of Greek states. It was remarked by Francis Bacon that artistic and imaginative nations indulge freely in verbal compounds, practical nations in simple concrete terms. In this respect, too, Latin contrasts with Greek. The attempts made by some of the earlier poets to indulge in novel compounds was felt to be out of harmony with the genius of the language. Composition, though necessarily employed, was kept within narrow limits, and the words thus produced have a sharply defined meaning, wholly unlike the poetical vagueness of some of the Greek compounds. The vocabulary of the language, though receiving accessions from time to time in accordance with practical needs, was rarely enriched by the products of a spontaneous creativeness. In literature the taste of the educated town circles gave the law; and these, trained in the study of the Greek masters of style, required something which should reproduce for them the harmony of the Greek period. Happily the orators who gave form to Latin prose were able to meet the demand without departing from the spirit of their own language.[7]

53. *Cicero and Caesar.*—To Cicero especially the Romans owed the realization of what was possible to their language in the way of artistic finish of style. He represents a protest at one and the same time against the inroads of the *plebeius sermo*, vulgarized by the constant influx of non-Italian provincials into Rome, and the "jargon of spurious and partial culture" in vogue among the Roman pupils of the Asiatic rhetoricians. His essential service was to have caught the tone and style of the true Roman *urbanitas*, and to have fixed it in extensive and widely read speeches and treatises as the final model of classical prose. The influence of Caesar was wholly in the same direction. His cardinal principle was that every new-fangled and affected expression, from whatever quarter it might come, should be avoided by the writer, as rocks by the mariner. His own style for straightforward simplicity and purity has never been surpassed; and it is not without full reason that Cicero and Caesar are regarded as the models of classical prose. But, while they fixed the type of the best Latin, they did not and could not alter its essential character. In subtlety, in suggestiveness, in many-sided grace and versatility, it remained far inferior to the Greek. But for dignity and force, for cadence and rhythm, for clearness and precision, the best Latin prose remains unrivalled.

It is needless to dwell upon the grammar or vocabulary of Cicero. His language is universally taken as the normal type of Latin; and, as hitherto the history of the language has been traced by marking differences from his usage, so the same method may be followed for what remains.

54. *Varro*, “the most learned of the ancients,” a friend and contemporary of Cicero, seems to have rejected the periodic rhythmical style of Cicero, and to have fallen back upon a more archaic structure. Mommsen says of one passage “the clauses of the sentence are arranged on the thread of the relative like dead thrushes on a string.” But, in spite (some would say, because) of his old-fashioned tendencies, his language shows great vigour and spirit. In his Menippean satires he intentionally made free use of plebeian expressions, while rising at times to a real grace and showing often fresh humour. His treatise *De Re Rustica*, in the form of a dialogue, is the most agreeable of his works, and where the nature of his subject allows it there is much vivacity and dramatic picturesqueness, although the precepts are necessarily given in a terse and abrupt form. His sentences are as a rule co-ordinated, with but few connecting links; his diction contains many antiquated or unique words.



55. *Sallust.*—In Sallust, a younger contemporary of Cicero, we have the earliest complete specimen of historical narrative. It is probably due to his subject-matter, at least in part, that his style is marked by frequent archaisms; but something must be ascribed to intentional imitation of the earlier chroniclers, which led him to be called *priscorum Catonisque verborum ineruditissimus fur*. His archaisms consist partly of words and phrases used in a sense for which we have only early authorities, *e.g. cum animo habere*, &c., *animos tollere*, *bene factum*, *consultor*, *prosapia*, *dolus*, *venenum*, *obsequela*, *inquies*, *sallere*, *occipere*, *collibeo*, and the like, where we may notice especially the fondness for frequentatives, which he shares with the early comedy; partly in inflections which were growing obsolete, such as *senati*, *solui*, *comperior* (dep.), *neglegisset*, *vis* (acc. pl.) *nequitur*. In syntax his constructions are for the most part those of the contemporary writers.

56. *Lucretius* is largely archaic in his style. We find *im* for *eum*, *endo* for *in*, *illae*, *ullae*, *unae* and *aliae* as genitives, *alid* for *aliud*, *rabies* as a genitive by the side of genitives in *-ai*, ablatives in *-i* like *colli*, *orbi*, *parti*, nominatives in *s* for *r*, like *colos*, *vapos*, *humos*. In verbs there are *scatit*, *fulgit*, *quaesit*, *confluxet* = *confluxisset*, *recesse* = *recessisse*, *induiacere* for *inicere*; simple forms like *fligere*, *lacere*, *cedere*, *stinguere* for the more usual compounds, the infinitive passive in *-ier*, and archaic forms from *esse* like *siet*, *escit*, *fuat*. Sometimes he indulges in tmesis which reminds us of Ennius: *inque pediri*, *disque supata*, *ordia prima*. But this archaic tinge is adopted only for poetical purposes, and as a proof of his devotion to the earlier masters of his art; it does not affect the general substance of his style, which is of the freshest and most vigorous stamp. But the purity of his idiom is not gained by any slavish adherence to a recognized vocabulary: he coins words freely; Munro has noted more than a hundred ἅπαξ λεγόμενα, or words which he alone among good writers uses. Many of these are formed on familiar models, such as compounds and frequentatives; others are directly borrowed from the Greek apparently with a view to sweetness of rhythm (ii. 412, v. 334, 505); others again (forty or more in number) are compounds of a kind which the classical language refused to adopt, such as *silvifragus*, *terriloquus*, *perterricrepus*. He represents not so much a stage in the history of the language as a protest against the tendencies fashionable in his own time. But his influence was deep upon Virgil, and through him upon all subsequent Latin literature.

57. *Catullus* gives us the type of the language of the cultivated circles, lifted into poetry by the simple directness with which it is used to express emotion. In his heroic and elegiac poems he did not escape the influence of the Alexandrian school, and his genius is ill suited for long-continued flights; but in his lyrical poems his language is altogether perfect. As Macaulay says: “No Latin writer is so Greek. The simplicity, the pathos, the perfect grace, which I find in the great Athenian models are all in Catullus, and in him alone of the Romans.” The language of these poems comes nearest perhaps to that of Cicero’s more intimate letters. It is full of colloquial idioms and familiar language, of the diminutives of affection or of playfulness. Greek words are rare, especially in the lyrics, and those which are employed are only such as had come to be current coin. Archaisms are but sparingly introduced; but for metrical reasons he has four instances of the inf. pass., in *-ier*, and several contracted forms; we find also *alis* and *alid*, *uni* (gen.), and the antiquated *tetuli* and *recepso*. There are traces of the popular language in the shortened imperatives *cavĕ* and *manĕ*, in the analytic perfect *paratam habes*, and in the use of *unus* approaching that of the indefinite article.

58. *Horace.*—The poets of the Augustan age mark the opening of a new chapter in the history of the Latin language. The influence of Horace was less than that of his friend and contemporary Virgil; for Horace worked in a field of his own, and, although Statius imitated his lyrics, and Persius and Juvenal, especially the former, his satires, on the whole there are few traces of any deep marks left by him on the language of later writers. In his *Satires* and *Epistles* the diction is that of the contemporary *urbanitas*, differing hardly at all from that of

Cicero in his epistles and dialogues. The occasional archaisms, such as the syncope in *erepsemus*, *evasse*, *surrexe*, the infinitives in -ier, and the genitives *deum*, *divum*, may be explained as still conversationally allowable, though ceasing to be current in literature; and a similar explanation may account for plebeian terms, *e.g. balatro*, *blatero*, *giarrio*, *mutto*, *vappa*, *caldus*, *soldus*, *surpite*, for the numerous diminutives, and for such pronouns, adverbs, conjunctions and turns of expression as were common in prose, but not found, or found but rarely, in elevated poetry. Greek words are used sparingly, not with the licence which he censures in Lucilius, and in his hexameters are framed according to Latin rules. In the *Odes*, on the other hand, the language is much more precisely limited. There are practically no archaisms (*spargier* in Carm. iv. 11. 8 is a doubtful exception), or plebeian expressions; Greek inflections are employed, but not with the licence of Catullus; there are no datives in *ĭ* or *sĭn* like *Tethyĭ* or *Dryasin*; Greek constructions are fairly numerous, *e.g.* the genitive with verbs like *regnare*, *abstinere*, *desinere*, and with adjectives, as *integer vitae*, the so-called Greek accusative, the dative with verbs of contest, like *luctari*, *decertare*, the transitive use of many intransitive verbs in the past participle, as *regnatus*, *triumphatus*; and finally there is a "prolative" use of the infinitive after verbs and adjectives, where prose would have employed other constructions, which, though not limited to Horace, is more common with him than with other poets. Compounds are very sparingly employed, and apparently only when sanctioned by authority. His own innovations in vocabulary are not numerous. About eighty ἅπαξ λεγόμενα have been noted. Like Virgil, he shows his exquisite skill in the use of language rather in the selection from already existing stores, than in the creation of new resources: *tantum series iuncturaque pollet*. But both his diction and his syntax left much less marked traces upon succeeding writers than did those of either Virgil or Ovid.

59. *Virgil.*—In Virgil the Latin language reached its full maturity. What Cicero was to the period, Virgil was to the hexameter; indeed the changes that he wrought were still more marked, inasmuch as the language of verse admits of greater subtlety and finish than even the most artistic prose. For the straightforward idiomatic simplicity of Lucretius and Catullus he substituted a most exact and felicitous diction, rich with the suggestion of the most varied sources of inspiration. Sometimes it is a phrase of Homer's "conveyed" literally with happy boldness, sometimes it is a line of Ennius, or again some artistic Sophoclean combination. Virgil was equally familiar with the great Greek models of style and with the earlier Latin poets. This learning, guided by an unerring sense of fitness and harmony, enabled him to give to his diction a music which recalls at once the fullest tones of the Greek lyre and the lofty strains of the most genuinely national song. His love of antiquarianism in language has often been noticed, but it never passes into pedantry. His vocabulary and constructions are often such as would have conveyed to his contemporaries a grateful flavour of the past, but they would never have been unintelligible. Forms like *iusso*, *olle* or *admittier* can have delayed no one.

In the details of syntax it is difficult to notice any peculiarly Virgilian points, for the reason that his language, like that of Cicero, became the canon, departures from which were accounted irregularities. But we may notice as favourite constructions a free use of oblique cases in the place of the more definite construction with prepositions usual in prose, *e.g. it clamor caelo*, *flet noctem*, *rivis currentia vina*, *bacchatam iugis Naxon*, and many similar phrases; the employment of some substantives as adjectives, like *venator canis*, and vice versa, as *plurimus volitans*; a proleptic use of adjectives, as *tristia torquebit*; idioms involving *ille*, *atque*, *deinde*, *haud*, *quin*, *vix*, and the frequent occurrence of passive verbs in their earlier reflexive sense, as *induor*, *velor*, *pascor*.

60. *Livy.*—In the singularly varied and beautiful style of Livy we find Latin prose in rich maturity. To a training in the rhetorical schools, and perhaps professional experience as a teacher of rhetoric, he added a thorough familiarity with contemporary poetry and with the Greek language; and these attainments have all deeply coloured his language. It is probable that the variety of style naturally suggested by the wide range of his subject matter was increased by a half-unconscious adoption of the phrases and constructions of the different authorities whom he followed in different parts of his work; and the industry of German critics has gone far to demonstrate a conclusion likely enough in itself. Hence perhaps comes the fairly long list of archaisms, especially in formulae (cf. Kühnast, *Liv. Synt.* pp. 14-18). These are, however, purely isolated phenomena, which do not affect the general tone. It is different with the poetical constructions and Graecisms, which appear on every page. Of the latter we find numerous instances in the use of the cases, *e.g.* in genitives like *via praedae omissae*, *oppidum Antiochiae*, *aequum campi*; in datives like *quibusdam volentibus erat*; in accusatives like *iurare calumniam*, *certare multam*; an especially frequent use of transitive verbs absolutely; and the constant omission of the reflexive pronoun as the subject

of an infinitive in reported speech. To the same source must be assigned the very frequent pregnant construction with prepositions, an attraction of relatives, and the great extension of the employment of relative adverbs of place instead of relative pronouns, *e.g. quo* = *in quem*. Among his poetical characteristics we may place the extensive list of words which are found for the first time in his works and in those of Virgil or Ovid, and perhaps his common use of concrete words for collective, *e.g. eques* for *equitatus*, of abstract terms such as *remigium*, *servitia*, *robora*, and of frequentative verbs, to say nothing of poetical phrases like *haec ubi dicta dedit, adversum montium*, &c. Indications of the extended use of the subjunctive, which he shares with contemporary writers, especially poets, are found in the construction of *ante quam*, *post quam* with this mood, even when there is no underlying notion of anticipation, of *donec*, and of *cum* meaning "whenever." On the other hand, *forsitan* and *quamvis*, as in the poets, are used with the indicative in forgetfulness of their original force. Among his individual peculiarities may be noticed the large number of verbal nouns in -*tus* (for which Cicero prefers forms in -*tio*) and in -*tor*, and the extensive use of the past passive participle to replace an abstract substantive, *e.g. ex dictatorio imperio concusso*. In the arrangement of words Livy is much more free than any previous prose writer, aiming, like the poets, at the most effective order. His periods are constructed with less regularity than those of Cicero, but they gain at least as much in variety and energy as they lose in uniformity of rhythm and artistic finish. His style cannot be more fitly described than in the language of Quintilian, who speaks of his *mira iucunditas* and *lactea ubertas*.

61. *Propertius.*—The language of Propertius is too distinctly his own to call for detailed examination here. It cannot be taken as a specimen of the great current of the Latin language; it is rather a tributary springing from a source apart, tinging to some slight extent the stream into which it pours itself, but soon ceasing to affect it in any perceptible fashion. "His obscurity, his indirectness and his incoherence" (to adopt the words of J. P. Postgate) were too much out of harmony with the Latin taste for him to be regarded as in any sense representative; sometimes he seems to be hardly writing Latin at all. Partly from his own strikingly independent genius, partly from his profound and not always judicious study of the Alexandrian writers, his poems abound in phrases and constructions which are without a parallel in Latin poetry. His archaisms and Graecisms, both in diction and in syntax, are very numerous; but frequently there is a freedom in the use of cases and prepositions which can only be due to bold and independent innovations. His style well deserves a careful study for its own sake (cf. J. P. Postgate's *Introduction*, pp. lvii.-cxxv.); but it is of comparatively little significance in the history of the language.

62. *Ovid.*—The brief and few poems of Tibullus supply only what is given much more fully in the works of Ovid. In these we have the language recognized as that best fitted for poetry by the fashionable circles in the later years of Augustus. The style of Ovid bears many traces of the imitation of Virgil, Horace and Propertius, but it is not less deeply affected by the rhetoric of the schools. His never-failing fertility of fancy and command of diction often lead him into a diffuseness which mars the effect of his best works; according to Quintilian it was only in his (lost) tragedy of *Medea* that he showed what real excellence he might have reached if he had chosen to control his natural powers. His influence on later poets was largely for evil; if he taught them smoothness of versification and polish of language, he also co-operated powerfully with the practice of recitation to lead them to aim at rhetorical point and striking turns of expression, instead of a firm grasp of a subject as a whole, and due subordination of the several parts to the general impression. Ovid's own influence on language was not great; he took the diction of poetry as he found it, formed by the labours of his predecessors; the conflict between the archaistic and the Graecizing schools was already settled in favour of the latter; and all that he did was to accept the generally accepted models as supplying the material in moulding which his luxuriant fancy could have free play. He has no deviations from classical syntax but those which were coming into fashion in his time (*e.g. forsitan* and *quamvis* with the indic., the dative of the agent with passive verbs, the ablative for the accusative of time, the infinitive after adjectives like *certus*, *aptus*, &c.), and but few peculiarities in his vocabulary. It is only in the letters from the Pontus that laxities of construction are detected, which show that the purity of his Latin was impaired by his residence away from Rome, and perhaps by increasing carelessness of composition.

63. *The Latin of Daily Life.*—While the leading writers of the Ciceronian and Augustan eras enable us to trace the gradual development of the Latin language to its utmost finish as an instrument of literary expression, there are some less important authors who supply valuable evidence of the character of the *sermo plebeius*. Among them may be placed the authors of the *Bellum Africanum* and the *Bellum Hispaniense* appended to Caesar's Commentaries. These are not only far inferior to the exquisite *urbanitas* of Caesar's own

writings; they are much rougher in style even than the less polished *Bellum Alexandrinum* and *De Bello Gallico Liber VIII.*, which are now with justice ascribed to Hirtius. There is sufficient difference between the two to justify us in assuming two different authors; but both freely employ words and constructions which are at once antiquated and vulgar. The writer of the *Bellum Alexandrinum* uses a larger number of diminutives within his short treatise than Caesar in nearly ten times the space; *postquam* and *ubi* are used with the pluperfect subjunctive; there are numerous forms unknown to the best Latin, like *tristimonia*, *exporrigere*, *cruciabiliter* and *convulnero*; *potior* is followed by the accusative, a simple relative by the subjunctive. There is also a very common use of the pluperfect for the imperfect, which seems a mark of this *plebeius sermo* (Nipperdey, *Quaest. Caes.* pp. 13-30).

Another example of what we may call the Latin of business life is supplied by Vitruvius. Besides the obscurity of many of his technical expressions, there is a roughness and looseness in his language, far removed from a literary style; he shares the incorrect use of the pluperfect, and uses plebeian forms like *calefaciuntur*, *faciliter*, *expertiones* and such careless phrases as *rogavit Archimedem uti in se sumeret sibi de eo cogitationem*. At a somewhat later stage we have, not merely plebeian, but also provincial Latin represented in the Satyricon of Petronius. The narrative and the poems which are introduced into it are written in a style distinguished only by the ordinary peculiarities of silver Latinity; but in the numerous conversations the distinctions of language appropriate to the various speakers are accurately preserved; and we have in the talk of the slaves and provincials a perfect storehouse of words and constructions of the greatest linguistic value. Among the unclassical forms and constructions may be noticed masculines like *fatus*, *vinus*, *balneus*, *fericulus* and *lactem* (for *lac*), *striga* for *strix*, *gaudimonium* and *tristimonium*, *sanguen*, *manducare*, *nutricare*, *molestare*, *nesapius* (*sapius* = Fr. *sage*), *rostrum* (= *os*), *ipsimus* (= master), *scordalias*, *baro*, and numerous diminutives like *camella*, *audaculus*, *potiuncula*, *savunculum*, *offla*, *peduclus*, *corcillum*, with constructions such as *maledicere* and *persuadere* with the accusative, and *adiutare* with the dative, and the deponent forms *pudeatur* and *ridetur*. Of especial interest for the Romance languages are *astrum* (*désastre*), *berbex* (*brébis*), *botellus* (*boyau*), *improperare*, *muttus*, *naufragare*.



Suetonius (*Aug. c.* 87) gives an interesting selection of plebeian words employed in conversation by Augustus, who for the rest was something of a purist in his written utterances: *ponit assidue et pro stulto baceolum, et pro pullo pulleiaceum, et pro cerrito vacerrosum, et vapide se habere pro male, et betizare pro languere, quod vulgo lachanizare dicitur*.

The inscriptions, especially those of Pompeii, supply abundant evidence of the corruptions both of forms and of pronunciation common among the vulgar. It is not easy always to determine whether a mutilated form is evidence of a letter omitted in pronunciation, or only in writing; but it is clear that the ordinary man habitually dropped final *m*, *s*, and *t*, omitted *n* before *s*, and pronounced *ĭ* like *ĕ*. There are already signs of the decay of *ae* to *e*, which later on became almost universal. The additions to our vocabulary are slight and unimportant (cf. *Corpus Inscr.* Lat. iv., with Zangemeister's *Indices*).

64. To turn to the language of literature. In the dark days of Tiberius and the two succeeding emperors a paralysis seemed to have come upon prose and poetry alike. With the one exception of oratory, literature had long been the utterance of a narrow circle, not the expression of the energies of national life; and now, while all free speech in the popular assemblies was silenced, the nobles were living under a suspicious despotism, which, whatever the advantage which it brought to the poorer classes and to the provincials, was to them a reign of terror. It is no wonder that the fifty years after the accession of Tiberius are a blank as regards all higher literature. Velleius Paterculus, Valerius Maximus, Celsus and Phaedrus give specimens of the Latin of the time, but the style of no one of these, classical for the most part in vocabulary, but occasionally approaching the later usages in syntax, calls for special analysis. The elder Seneca in his collection of *suasoriae* and *controversiae* supplies examples of the barren quibblings by which the young Romans were trained in the rhetorical schools. A course of instruction, which may have been of service when its end was efficiency in active public life, though even then not without its serious drawbacks, as is shown by Cicero in his treatise *De Oratore*, became seriously injurious when its object was merely idle display. Prose came to be overloaded with ornament, and borrowed too often the language, though not the genius, of poetry; while poetry in its turn, partly owing to the fashion of recitation, became a string of rhetorical points.

65. *Seneca, Persius and Lucan.*—In the writers of Nero's age there are already plain indications of the evil effects of the rhetorical schools upon language as well as literature. The leading man of letters was undoubtedly Seneca the younger, "the Ovid of prose"; and his style set the model which it became the fashion to imitate. But it could not commend

itself to the judgment of sound critics like Quintilian, who held firmly to the great masters of an earlier time. He admits its brilliance, and the fertility of its pointed reflections, but charges the author justly with want of self-restraint, jerkiness, frequent repetitions and tawdry tricks of rhetoric. Seneca was the worst of models, and pleased by his very faults. In his tragedies the rhetorical elaboration of the style only serves to bring into prominence the frigidity and frequent bad taste of the matter. But his diction is on the whole fairly classical; he is, in the words of Muretus, *vetusti sermonis diligentior quam quidam inepte fastidiosi suspicantur*. In Persius there is a constant straining after rhetorical effect, which fills his verses with harsh and obscure expressions. The careful choice of diction by which his master Horace makes every word tell is exaggerated into an endeavour to gain force and freshness by the most contorted phrases. The sin of allusiveness is fostered by the fashion of the day for epigram, till his lines are barely intelligible after repeated reading. Conington happily suggested that this style was assumed only for satiric purposes, and pointed out that when not writing satire Persius was as simple and unaffected as Horace himself. This view, while it relieves Persius of much of the censure which has been directed against his want of judgment, makes him all the more typical a representative of this stage of silver Latinity. In his contemporary Lucan we have another example of the faults of a style especially attractive to the young, handled by a youth of brilliant but ill-disciplined powers. The *Pharsalia* abounds in spirited rhetoric, in striking epigram, in high sounding declamation; but there are no flights of sustained imagination, no ripe wisdom, no self-control in avoiding the exaggerated or the repulsive, no mature philosophy of life or human destiny. Of all the Latin poets he is the least Virgilian. It has been said of him that he corrupted the style of poetry, not less than Seneca that of prose.

66. *Pliny*, *Quintilian*, *Frontinus*.—In the elder Pliny the same tendencies are seen occasionally breaking out in the midst of the prosaic and inartistic form in which he gives out the stores of his cumbrous erudition. Wherever he attempts a loftier tone than that of the mere compiler, he falls into the tricks of Seneca. The nature of his encyclopaedic subject matter naturally makes his vocabulary very extensive; but in syntax and general tone of language he does not differ materially from contemporary writers. Quintilian is of interest especially for the sound judgment which led him to a true appreciation of the writers of Rome’s golden age. He set himself strenuously to resist the tawdry rhetoric fashionable in his own time, and to hold up before his pupils purer and loftier models. His own criticisms are marked by excellent taste, and often by great happiness of expression, which is pointed without being unduly epigrammatic. But his own style did not escape, as indeed it hardly could, the influences of his time; and in many small points his language falls short of classical purity. There is more approach to the simplicity of the best models in Frontinus, who furnishes a striking proof that it was rather the corruption of literary taste than any serious change in the language of ordinary cultivated men to which the prevalent style was due. Writing on practical matters—the art of war and the water-supply of Rome—he goes straight to the point without rhetorical flourishes; and the ornaments of style which he occasionally introduces serve to embellish but not to distort his thought.

67. *The Flavian Age.*—The epic poets of the Flavian age present a striking contrast to the writers of the Claudian period. As a strained originality was the cardinal fault of the one school, so a tame and slavish following of authority is the mark of the other. The general *correctness* of this period may perhaps be ascribed (with Merivale) partly to the political conditions, partly to the establishment of professional schools. Teachers like Quintilian must have done much to repress extravagance of thought and language; but they could not kindle the spark of genius. Valerius Flaccus, Silius Italicus and Papinius Statius are all correct in diction and in rhythm, and abound in learning; but their inspiration is drawn from books and not from nature or the heart; details are elaborated to the injury of the impression of the whole; every line is laboured, and overcharged with epigrammatic rhetoric. Statius shows by far the greatest natural ability and freshness; but he attempts to fill a broad canvas with drawing and colouring suited only to a miniature. Juvenal exemplifies the tendencies of the language of his time, as moulded by a singularly powerful mind. A careful study of the earlier poets, especially Virgil and Lucan, has kept his language up to a high standard of purity. His style is eminently rhetorical; but it is rhetoric of real power. The concise brevity by which it is marked seems to have been the result of a deliberate attempt to mould his natural diffuseness into the form recognized as most appropriate for satire. In his verses we notice a few metrical peculiarities which represent the pronunciation of his age, especially the shortening of the final *-o* in verbs, but as a rule they conform to the Virgilian standard. In Martial the tendency of this period to witty epigram finds its most perfect embodiment, combined with finished versification.

68. *Pliny the Younger and Tacitus.*—The typical prose-writers of this time are Pliny the

younger and Tacitus. Some features of the style of Tacitus are peculiar to himself; but on the whole the following statement represents the tendencies shared in greater or less degree by all the writers of this period. The gains lie mainly in the direction of a more varied and occasionally more effective syntax; its most striking defect is a lack of harmony in the periods, of arrangements in words, of variety in particles arising from the loose connexion of sentences. The vocabulary is extended, but there are losses as well as gains. Quintilian's remarks are fully borne out by the evidence of extant authorities: on the one hand, *quid quod nihil iam proprium placet, dum parum creditur disertum, quod et alius dixisset* (viii. *prooem.* 24); *a corruptissimo quoque poetarum figuras seu translationes mutuamur; tum demum ingeniosi scilicet, si ad intelligendos nos opus sit ingenio* (*ib.* 25); *sordet omne quod natura dictavit* (*ib.* 26); on the other hand, *nunc utique, cum haec exercitatio procul a veritate seiuncta laboret incredibili verborum fastidio, ac sibi magnam partem sermonis absciderit* (viii. 3, 23), *multa cotidie ab antiquis ficta moriuntur* (*ib.* 6, 32). A writer like Suetonius therefore did good service in introducing into his writings terms and phrases borrowed, not from the rhetoricians, but from the usage of daily life.



69. In the vocabulary of Tacitus there are to be noted:—

1. Words borrowed (consciously or unconsciously) from the classical poets, especially Virgil, occurring for the most part also in contemporary prose. Of these Dräger gives a list of ninety-five (*Syntax und Stil des Tacitus*, p. 96).

2. Words occurring only, or for the first time, in Tacitus. These are for the most part new formations or compounds from stems already in use, especially verbal substantives in *-tor* and *-sor*, *-tus* and *-sus*, *-tura* and *-mentum*, with new frequentatives.

3. Words used with a meaning (*a*) not found in earlier prose, but sometimes borrowed from the poets, *e.g. componere*, "to bury"; *scriptura*, "a writing"; *ferratus* "armed with a sword"; (*b*) peculiar to later writers, *e.g. numerosus*, "numerous"; *famosus*, "famous"; *decollare*, "to behead"; *imputare*, "to take credit for," &c.; (*c*) restricted to Tacitus himself, *e.g. dispergere* = *divolgare*.

Generally speaking, Tacitus likes to use a simple verb instead of a compound one, after the fashion of the poets, employs a pluperfect for a perfect, and (like Livy and sometimes Caesar) aims at vividness and variety by retaining the present and perfect subjunctive in indirect speech even after historical tenses. Collective words are followed by a plural far more commonly than in Cicero. The ellipse of a verb is more frequent. The use of the cases approximates to that of the poets, and is even more free. The accusative of limitation is common in Tacitus, though never found in Quintilian. Compound verbs are frequently followed by the accusative where the dative might have been expected; and the Virgilian construction of an accusative with middle and passive verbs is not unusual. The dative of purpose and the dative with a substantive in place of a genitive are more common with Tacitus than with any writer. The ablative of separation is used without a preposition, even with names of countries and with common nouns; the ablative of place is employed similarly without a preposition; the ablative of time has sometimes the force of duration; the instrumental ablative is employed even of persons. A large extension is given to the use of the quantitative genitive after neuter adjectives and pronouns, and even adverbs, and to the genitive with active participles; and the genitive of relation after adjectives is (probably by a Graecism) very freely employed. In regard to prepositions, there are special uses of *citra*, *erga*, *iuxta* and *tenus* to be noted, and a frequent tendency to interchange the use of a preposition with that of a simple case in corresponding clauses. In subordinate sentences *quod* is used for "the fact that," and sometimes approaches the later use of "that"; the infinitive follows many verbs and adjectives that do not admit of this construction in classical prose; the accusative and infinitive are used after negative expressions of doubt, and even in modal and hypothetical clauses.

Like Livy, the writers of this time freely employ the subjunctive of repeated action with a relative, and extend its use to relative conjunctions, which he does not. In clauses of comparison and proportion there is frequently an ellipse of a verb (with *nihil aliud quam*, *ut*, *tanquam*); *tanquam*, *quasi* and *velut* are used to imply not comparison but alleged reason; *quin* and *quominus* are interchanged at pleasure. *Quamquam* and *quamvis* are commonly followed by the subjunctive, even when denoting facts. The free use of the genitive and dative of the gerundive to denote purpose is common in Tacitus, the former being almost limited to him. Livy's practice in the use of participles is extended even beyond the limits to which he restricts it. It has been calculated that where Caesar uses five participial clauses, Livy has sixteen, Tacitus twenty-four.

In his compressed brevity Tacitus may be said to be individual; but in the poetical colouring of his diction, in the rhetorical cast of his sentences, and in his love for picturesqueness and variety he is a true representative of his time.

70. *Suetonius.*—The language of Suetonius is of interest as giving a specimen of silver Latinity almost entirely free from personal idiosyncrasies; his expressions are regular and straightforward, clear and business-like; and, while in grammar he does not attain to classical purity, he is comparatively free from rhetorical affectations.

71. *The African Latinity.*—A new era commences with the accession of Hadrian (117). As the preceding half century had been marked by the influence of Spanish Latinity (the Senecas, Lucan, Martial, Quintilian), so in this the African style was paramount. This is the period of affected archaisms and pedantic learning, combined at times with a reckless love of innovation and experiment, resulting in the creation of a large number of new formations and in the adoption of much of the plebeian dialect. Fronto and Apuleius mark a strong reaction against the culture of the preceding century, and for evil far more than for good the chain of literary tradition was broken. The language which had been unduly refined and elaborated now relapsed into a tasteless and confused patch-work, without either harmony or brilliance of colouring. In the case of the former the subject matter is no set-off against the inferiority of the style. He deliberately attempts to go back to the obsolete diction of writers like Cato and Ennius. We find compounds like *altipendulus*, *nudiustertianus*, *tolutiloquentia*, diminutives such as *matercella*, *anulla*, *passercula*, *studiolum*, forms like *congarrire*, *disconcinnus*, *pedetemptius*, *desiderantissimus* (passive), *conticinium*; *gaudeo*, *oboedio* and *perfungor* are used with an accusative, *modestus* with a genitive. On the other hand he actually attempts to revive the form *asa* for *ara*. In Apuleius the archaic element is only one element in the queer mixture which constitutes his style, and it probably was not intended to give the tone to the whole. Poetical and prosaic phrases, Graecisms, solecisms, jingling assonances, quotations and coinages apparently on the spur of the moment, all appear in this wonderful medley. There are found such extraordinary genitives as *sitire beatitudinis*, *cenae pignerarer*, *incoram omnium*, *foras corporis*, sometimes heaped one upon another as *fluxos vestium Arsacidas et frugum pauperes Ityraeos et odorum divites Arabas*. Diminutives are coined with reckless freedom, *e.g. diutule*, *longule*, *mundule amicta el altiuscule sub ipsas papillas succinctula*. He confesses himself that he is writing in a language not familiar to him: *In urbe Latia advena studiorum Quiritium indigenam sermonem aerumnabili labore, nullo magistro praeeunte, aggressus excolui*; and the general impression of his style fully bears out his confession. Melanchthon is hardly too severe when he says that Apuleius brays like his own ass. The language of Aulus Gellius is much superior in purity; but still it abounds in rare and archaic words, *e.g. edulcare*, *recentari*, *aeruscator*, and in meaningless frequentatives like *solitavisse*. He has some admirable remarks on the pedantry of those who delighted in obsolete expressions (xi. 7) such as *apluda*, *flocus* and *bovinator*; but his practice falls far short of his theory.

72. *The Lawyers.*—The style of the eminent lawyers of this period, foremost among whom is Gaius, deserves especial notice as showing well one of the characteristic excellences of the Latin language. It is for the most part dry and unadorned, and in syntax departs occasionally from classical usages, but it is clear, terse and exact. Technical terms may cause difficulty to the ordinary reader, but their meaning is always precisely defined; new compounds are employed whenever the subject requires them, but the capacities of the language rise to the demands made upon it; and the conceptions of jurisprudence have never been more adequately expressed than by the great Romanist jurists.

(A. S. W.; R. S. C.)

For the subsequent history of the language see ROMANCE LANGUAGES.

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1 The grounds for this pronunciation will be found best stated in Postgate, *How to pronounce Latin* (1907), Arnold and Conway, *The Restored Pronunciation of Greek and Latin* (4th ed., Cambridge, 1908); and in the grammars enumerated in § 28 above, especially the preface to vol. i. of *Roby's Grammar*. The chief points about *c* may be briefly given as a specimen of the kind of evidence. (1) In some words the letter following c varies in a manner which makes it impossible to believe that the pronunciation of the *c* depended upon this, *e.g. decumus* and *decimus*, *dīc* from Plaut. *dīce*; (2) if *c* was pronounced before *e* and *i* otherwise than before *a*, *o* and *u*, it is hard to see why *k* should not have been retained for the latter use; (3) no ancient writer gives any hint of a varying pronunciation of *c*; (4) a Greek κ is always transliterated by *c*, and *c* by κ; (5) Latin words containing *c* borrowed by Gothic and early High German are always spelt with *k*; (6) the varying pronunciations of *ce*, *ci* in the Romance languages are inexplicable except as derived independently from an original *ke*, *ki*.

2 The inscription was first published by Helbig and Dümmler in *Mittheilungen des deutschen archaol. Inst. Rom.* ii. 40; since in *C.I.L.* xiv. 4123 and Conway, *Italic Dial.* 280, where other references will be found.

3 This inscription was first published by Dressel, *Annali dell' Inst. Archeol. Romano* (1880), p.

158, and since then by a multitude of commentators. The view of the inscription as a curse, translating a Greek cursing-formula, which has been generally adopted, was first put forward by R. S. Conway in the *American Journal of Philology*, x. (1889), 453; see further his commentary *Italic Dialects*, p. 329, and since then G. Hempl, *Trans. Amer. Philol. Assoc.* xxxiii. (1902), 150, whose interpretation of *iouesat = iurat* and *Opetoi Tesiai* has been here adopted, and who gives other references.

4 The most important writings upon it are those of Domenico Comparetti, *Iscriz. arcaica del Foro Romano* (Florence-Rome, 1900); Hülsen, *Berl. philolog. Wochenschrift* (1899), No. 40; and Thurneysen, *Rheinisches Museum* (Neue Folge), iii. 2. Prof. G. Tropea gives a *Cronaca della discussione* in a series of very useful articles in the *Rivista di storia antica* (Messina, 1900 and 1901). Skutsch's article already cited puts the trustworthy results in an exceedingly brief compass.

5 For further information see special articles on these authors, and LATIN LITERATURE.

6 Cicero also refers to certain *scripta dulcissima* of the son of Scipio Africanus Maior, which must have possessed some merits of style.

7 The study of the rhythm of the *Clausulae*, *i.e.* of the last dozen (or half-dozen) syllables of a period in different Latin authors, has been remarkably developed in the last three years, and is of the highest importance for the criticism of Latin prose. It is only possible to refer to Th. Zielinski's *Das Clauselgesetz in Cicero's Reden* (St. Petersburg, 1904), reviewed by A. C. Clark in *Classical Review*, 1905, p. 164, and to F. Skutsch's important comments in Vollmöller's *Jahresberichten über die Fortschritte der romanischen Philologie* (1905) and *Glotta* (i. 1908, esp. p. 413), also to A. C. Clark's *Fontes Prosae Numerosae* (Oxford, 1909), *The Cursus in Mediaeval and Vulgar Latin* (ibid. 1910), and article CICERO.

## LATIN LITERATURE.

The germs of an indigenous literature had existed at an early period in Rome and in the country districts of Italy, and they have an importance as indicating natural wants in the Italian race, which were ultimately satisfied by regular literary forms. The art of writing was first employed in the service of the state and of religion for books of ritual, treaties with other states, the laws of the Twelve Tables and the like. An approach to literature was made in the *Annales Maximi*, records of private families, funeral orations and inscriptions on busts and tombs such as those of the Scipios in the Appian Way. In the satisfaction they afforded to the commemorative and patriotic instincts they anticipated an office afterwards performed by the national epics and the works of regular historians. A still nearer approach to literature was probably made in oratory, as we learn from Cicero that the famous speech delivered by Appius Claudius Caecus against concluding peace with Pyrrhus (280 B.C.) was extant in his time. Appius also published a collection of moral maxims and reflections in verse. No other name associated with any form of literature belonging to the pre-literary age has been preserved by tradition.



But it was rather in the chants and litanies of the ancient religion, such as those of the Salii and the Fratres Arvales, and the dirges for the dead (*neniae*), and in certain extemporaneous effusions, that some germs of a native poetry might have been detected; and finally in the use of Saturnian verse, a metre of pure native origin, which by its rapid and lively movement gave expression to the vivacity and quick apprehension of the Italian race. This metre was employed in ritual hymns, which seem to have assumed definite shapes out of the exclamations of a primitive priesthood engaged in a rude ceremonial dance. It was also used by a class of bards or itinerant soothsayers known by the name of *vates*, of whom the most famous was one Marcius, and in the "Fescennine verses," as sung at harvest-homes and weddings, which gave expression to the coarse gaiety of the people and to their strong tendency to personal raillery and satiric comment. The metre was also employed in commemorative poems, accompanied with music, which were sung at funeral banquets in celebration of the exploits and virtues of distinguished men. These had their origin in the same impulse which ultimately found its full gratification in Roman history, Roman epic poetry, and that form of Roman oratory known as *laudationes*, and in some of the *Odes* of Horace. The latest and probably the most important of these rude and inchoate forms was that of dramatic *saturae* (medleys), put together without any regular plot and consisting apparently of contests of wit and satiric invective, and perhaps of comments on current events, accompanied with music (Livy vii. 2). These have a real bearing on the subsequent

development of Latin literature. They prepared the mind of the people for the reception of regular comedy. They may have contributed to the formation of the style of comedy which appears at the very outset much more mature than that of serious poetry, tragic or epic. They gave the name and some of the characteristics to that special literary product of the Roman soil, the *satura*, addressed to readers, not to spectators, which ultimately was developed into pure poetic satire in Lucilius, Horace, Persius and Juvenal, into the prose and verse miscellany of Varro, and into something approaching the prose novel in Petronius.

### *First Period: from 240 to about 80 B.C.*

**Livius Andronicus.**

The historical event which brought about the greatest change in the intellectual condition of the Romans, and thereby exercised a decisive influence on the whole course of human culture, was the capture of Tarentum in 272. After the capture many Greek slaves were brought to Rome, and among them the young Livius Andronicus (*c.* 284-204), who was employed in teaching Greek in the family of his master, a member of the Livian gens. From that time to learn Greek became a regular part of the education of a Roman noble. The capture of Tarentum was followed by the complete Romanizing of all southern Italy. Soon after came the first Punic war, the principal scene of which was Sicily, where, from common hostility to the Carthaginian, Greek and Roman were brought into friendly relations, and the Roman armies must have become familiar with the spectacles and performances of the Greek theatre. In the year after the war (240), when the armies had returned and the people were at leisure to enjoy the fruits of victory, Livius Andronicus substituted at one of the public festivals a regular drama, translated or adapted from the Greek, for the musical medleys (*saturae*) hitherto in use. From this time dramatic performances became a regular accompaniment of the public games, and came more and more to encroach on the older kinds of amusement, such as the chariot races. The dramatic work of Livius was mainly of educative value. The same may be said of his translation of the *Odyssey*, which was still used as a school-book in the days of Horace, and the religious hymn which he was called upon to compose in 207 had no high literary pretensions. He was, however, the first to familiarize the Romans with the forms of the Greek drama and the Greek epic, and thus to determine the main lines which Latin literature followed for more than a century afterwards.

**Naevius.**

His immediate successor, Cn. Naevius (d. *c.* 200 B.C.), was not, like Livius, a Greek, but either a Roman citizen or, more probably, a Campanian who enjoyed the limited citizenship of a Latin and who had served in the Roman army in the first Punic war. His first appearance as a dramatic author was in 235. He adapted both tragedies and comedies from the Greek, but the bent of his genius, the tastes of his audience, and the condition of the language developed through the active intercourse and business of life, gave a greater impulse to comedy than to tragedy. Naevius tried to use the theatre, as it had been used by the writers of the Old Comedy of Athens, for the purposes of political warfare, and thus seems to have anticipated by a century the part played by Lucilius. But his attacks upon the Roman aristocracy, especially the Metelli, were resented by their objects; and Naevius, after being imprisoned, had to retire in his old age into banishment. He was not only the first in point of time, and according to ancient testimony one of the first in point of merit, among the comic poets of Rome, and in spirit, though not in form, the earliest of the line of Roman satirists, but he was also the oldest of the national poets. Besides celebrating the success of M. Claudius Marcellus in 222 over the Gauls in a play called *Clastidium*, he gave the first specimen of the *fabula praetexta* in his *Alimonium Romuli et Remi*, based on the most national of all Roman traditions. Still more important service was rendered by him in his long Saturnian poem on the first Punic war, in which he not only told the story of contemporary events but gave shape to the legend of the settlement of Aeneas in Latium,—the theme ultimately adopted for the great national epic of Rome.

**Plautus.**

His younger contemporary T. Maccius Plautus (*c.* 254-184) was the greatest comic dramatist of Rome. He lived and wrote only to amuse his contemporaries, and thus, although more popular in his lifetime and more fortunate than any of the older authors in the ultimate survival of a large number of his works, he is less than any of the great writers of Rome in sympathy with either the serious or the caustic spirit in Latin literature. Yet he is the one extant witness to the humour and vivacity of the Italian temperament at a stage between its early rudeness and rigidity and its subsequent degeneracy.

Thus far Latin literature, of which the predominant characteristics are dignity, gravity and

fervour of feeling, seemed likely to become a mere vehicle of amusement adapted to all classes of the people in their holiday mood. But a new spirit, which henceforth became predominant, appeared in the time of Plautus. Latin literature ceased to be in close sympathy with the popular spirit, either politically or as a form of amusement, but became the expression of the ideas, sentiment and culture of the aristocratic governing class. It was by Q. Ennius (239-169) of Rudiae in Messapia, that a new direction was given to Latin literature. Deriving from his birthplace the culture, literary and philosophical, of Magna Graecia, and having gained the friendship of the greatest of the Romans living in that great age, he was of all the early writers most fitted to be the medium of conciliation between the serious genius of ancient Greece and the serious genius of Rome. Alone among the older writers he was endowed with the gifts of a poetical imagination and animated with enthusiasm for a great ideal.

***Ennius.***

First among his special services to Latin literature was the fresh impulse which he gave to tragedy. He turned the eyes of his contemporaries from the commonplace social humours of later Greek life to the contemplation of the heroic age. But he did not thereby denationalize the Roman drama. He animated the heroes of early Greece with the martial spirit of Roman soldiers and the ideal magnanimity and sagacity of Roman senators, and imparted weight and dignity to the language and verse in which their sentiments and thoughts were expressed. Although Rome wanted creative force to add a great series of tragic dramas to the literature of the world, yet the spirit of elevation and moral authority breathed into tragedy by Ennius passed into the ethical and didactic writings and the oratory of a later time.



Another work was the *Saturae*, written in various metres, but chiefly in the trochaic tetrameter. He thus became the inventor of a new form of literature; and, if in his hands the *satura* was rude and indeterminate in its scope, it became a vehicle by which to address a reading public on matters of the day, or on the materials of his wide reading, in a style not far removed from the language of common life. His greatest work, which made the Romans regard him as the father of their literature, was his epic poem, in eighteen books, the *Annales*, in which the record of the whole career of Rome was unrolled with idealizing enthusiasm and realistic detail. The idea which inspired Ennius was ultimately realized in both the national epic of Virgil and the national history of Livy. And the metrical vehicle which he conceived as the only one adequate to his great theme was a rude experiment, which was ultimately developed into the stately Virgilian hexameter. Even as a grammarian he performed an important service to the literary language of Rome, by fixing its prosody and arresting the tendency to decay in its final syllables. Although of his writings only fragments remain, these fragments are enough, along with what we know of him from ancient testimony, to justify us in regarding him as the most important among the makers of Latin literature before the age of Cicero.

There is still one other name belonging partly to this, partly to the next generation, to be added to those of the men of original force of mind and character who created Latin literature, that of M. Porcius Cato the Censor (234-149), the younger contemporary of Ennius, whom he brought to Rome. More than Naevius and Plautus he represented the pure native element in that literature, the mind and character of Latium, the plebeian pugnacity, which was one of the great forces in the Roman state. His lack of imagination and his narrow patriotism made him the natural leader of the reaction against the new Hellenic culture. He strove to make literature ancillary to politics and to objects of practical utility, and thus started prose literature on the chief lines that it afterwards followed. Through his industry and vigorous understanding he gave a great impulse to the creation of Roman oratory, history and systematic didactic writing. He was one of the first to publish his speeches and thus to bring them into the domain of literature. Cicero, who speaks of 150 of these speeches as extant in his day, praises them for their acuteness, their wit, their conciseness. He speaks with emphasis of the impressiveness of Cato’s eulogy and the satiric bitterness of his invective.

***Cato.***

Cato was the first historical writer of Rome to use his native tongue. His *Origines*, the work of his old age, was written with that thoroughly Roman conception of history which regarded actions and events solely as they affected the continuous and progressive life of a state. Cato felt that the record of Roman glory could not be isolated from the story of the other Italian communities, which, after fighting against Rome for their own independence, shared with her the task of conquering the world. To the wider national sympathies which stimulated the researches of the old censor into the legendary history of the Italian towns we owe some of the most truly national parts of Virgil’s *Aeneid*.

In Naevius, Plautus, Ennius and Cato are represented the contending forces which strove

for ascendancy in determining what was to be the character of the new literature. The work, begun by them, was carried on by younger contemporaries and successors; by Statius Caecilius (*c.* 220-168), an Insubrian Gaul, in comedy; in tragedy by M. Pacuvius (*c.* 220-132), the nephew of Ennius, called by Cicero the greatest of Roman tragedians; and, in the following generation, by L. Accius (*c.* 170-86), who was more usually placed in this position. The impulse given to oratory by Cato, Ser. Sulpicius Galba and others, and along with it the development of prose composition, went on with increased momentum till the age of Cicero. But the interval between the death of Ennius (169) and the beginning of Cicero's career, while one of progressive advance in the appreciation of literary form and style, was much less distinguished by original force than the time immediately before and after the end of the second Punic war. The one complete survival of the generation after the death of Ennius, the comedy of P. Terentius Afer or Terence (*c.* 185-159), exemplifies the gain in literary accomplishment and the loss in literary freedom. Terence has nothing Roman or Italian except his pure and idiomatic Latinity. His Athenian elegance affords the strongest contrast to the Italian rudeness of Cato's *De Re Rustica*. By looking at them together we understand how much the comedy of Terence was able to do to refine and humanize the manners of Rome, but at the same time what a solvent it was of the discipline and ideas of the old republic. What makes Terence an important witness of the culture of his time is that he wrote from the centre of the Scipionic circle, in which what was most humane and liberal in Roman statesmanship was combined with the appreciation of what was most vital in the Greek thought and literature of the time. The comedies of Terence may therefore be held to give some indication of the tastes of Scipio, Laelius and their friends in their youth. The influence of Panaetius and Polybius was more adapted to their maturity, when they led the state in war, statesmanship and oratory, and when the humaner teaching of Stoicism began to enlarge the sympathies of Roman jurists. But in the last years during which this circle kept together a new spirit appeared in Roman politics and a new power in Roman literature,—the revolutionary spirit evoked by the Gracchi in opposition to the long-continued ascendancy of the senate, and the new power of Roman satire, which was exercised impartially and unsparingly against both the excesses of the revolutionary spirit and the arrogance and incompetence of the extreme party among the nobles. Roman satire, though in form a legitimate development of the indigenous dramatic *satura* through the written *satura* of Ennius and Pacuvius, is really a birth of this time, and its author was the youngest of those admitted into the intimacy of the Scipionic circle, C. Lucilius of Suessa Aurunca (*c.* 180-103). Among the writers before the age of Cicero he alone deserves to be named with Naevius, Plautus Ennius and Cato as a great originative force in literature. For about thirty years the most important event in Roman literature was the production of the satires of Lucilius, in which the politics, morals, society and letters of the time were criticized with the utmost freedom and pungency, and his own personality was brought immediately and familiarly before his contemporaries. The years that intervened between his death and the beginning of the Ciceronian age are singularly barren in works of original value. But in one direction there was some novelty. The tragic writers had occasionally taken their subjects from Roman life (*fabulae praetextae*), and in comedy we find the corresponding *togatae* of Lucius Afranius and others, in which comedy, while assuming a Roman dress, did not assume the virtue of a Roman matron.

***Terence.***

***Lucilius.***

The general results of the last fifty years of the first period (130 to 80) may be thus summed up. In poetry we have the satires of Lucilius, the tragedies of Accius and of a few successors among the Roman aristocracy, who thus exemplified the affinity of the Roman stage to Roman oratory; various annalistic poems intended to serve as continuations of the great poem of Ennius; minor poems of an epigrammatic and erotic character, unimportant anticipations of the Alexandrian tendency operative in the following period; works of criticism in trochaic tetrameters by Porcius Licinus and others, forming part of the critical and grammatical movement which almost from the first accompanied the creative movement in Latin literature, and which may be regarded as rude precursors of the didactic epistles that Horace devoted to literary criticism.

***General results from 130 to 80.***



The only extant prose work which may be assigned to the end of this period is the treatise on rhetoric known by the title *Ad Herennium* (*c.* 84) a work indicative of the attention bestowed on prose style and rhetorical studies during the last century of the republic, and which may be regarded as a precursor of the oratorical treatises of Cicero and of the work of Quintilian. But the great literary product of this period was oratory, developed indeed with the aid of these rhetorical studies, but itself the immediate outcome of the imperial interests, the legal conflicts, and the political passions of that time

***Oratory.***

of agitation. The speakers and writers of a later age looked back on Scipio and Laelius, the Gracchi and their contemporaries, L. Crassus and M. Antonius, as masters of their art.

***History.***

In history, regarded as a great branch of prose literature, it is not probable that much was accomplished, although, with the advance of oratory and grammatical studies, there must have been not only greater fluency of composition but the beginning of a richer and more ornate style. Yet Cicero denies to Rome the existence, before his own time, of any adequate historical literature. Nevertheless it was by the work of a number of Roman chroniclers during this period that the materials of early Roman history were systematized, and the record of the state, as it was finally given to the world in the artistic work of Livy, was extracted from the early annals, state documents and private memorials, combined into a coherent unity, and supplemented by invention and reflection. Amongst these chroniclers may be mentioned L. Calpurnius Piso Frugi (consul 133, censor 108), C. Sempronius Tuditanus (consul 129), Cn. Gellius, C. Fannius (consul 122), L. Coelius Antipater, who wrote a narrative of the second Punic war about 120, and Sempronius Asellio, who wrote a history of his own times, have a better claim to be considered historians. There were also special works on antiquities and contemporary memoirs, and autobiographies such as those of M. Aemilius Scaurus, the elder, Q. Lutatius Catulus (consul 102 B.C.), and P. Rutilius Rufus, which formed the sources of future historians. (See further ANNALES; and ROME: *History*, *Ancient*, § "Authorities.")

***Summary of the period.***

Although the artistic product of the first period of Latin literature which has reached us in a complete shape is limited to the comedies of Plautus and Terence, the influence of the lost literature in determining the spirit, form and style of the eras of more perfect accomplishment which followed is unmistakable. While humour and vivacity characterize the earlier, and urbanity of tone the later development of comedy, the tendency of serious literature had been in the main practical, ethical, commemorative and satirical. The higher poetical imagination had appeared only in Ennius, and had been called forth in him by sympathy with the grandeur of the national life and the great personal qualities of its representative men. Some of the chief motives of the later poetry, *e.g.* the pleasures and sorrows of private life, had as yet found scarcely any expression in Latin literature. The fittest metrical vehicle for epic, didactic, and satiric poetry had been discovered, but its movement was as yet rude and inharmonious. The idiom of ordinary life and social intercourse and the more fervid and elevated diction of oratorical prose had made great progress, but the language of imagination and poetical feeling was, if vivid and impressive in isolated expressions, still incapable of being wrought into consecutive passages of artistic composition. The influences of Greek literature to which Latin literature owed its birth had not as yet spread beyond Rome and Latium. The Sabellian races of central and eastern Italy and the Italo-Celtic and Venetian races of the north, in whom the poetic susceptibility of Italy was most manifest two generations later, were not, until after the Social war, sufficiently in sympathy with Rome, and were probably not as yet sufficiently educated to induce them to contribute their share to the national literature. Hence the end of the Social war, and of the Civil war, which arose out of it, is most clearly a determining factor in Roman literature, and may most appropriately be taken as marking the end of one period and the beginning of another.

### *Second Period: from 80 to 42 B.C.*

The last age of the republic coincides with the first half of the Golden age of Roman literature. It is generally known as the Ciceronian age from the name of its greatest literary representative, whose activity as a speaker and writer was unremitting during nearly the whole period. It is the age of purest excellence in prose, and of a new birth of poetry, characterized rather by great original force and artistic promise than by perfect accomplishment. The five chief representatives of this age who still hold their rank among the great classical writers are Cicero, Caesar and Sallust in prose, Lucretius and Catullus in verse. The works of other prose writers, Varro and Cornelius Nepos, have been partially preserved; but these writers have no claim to rank with those already mentioned as creators and masters of literary style. Although literature had not as yet become a trade or profession, an educated reading public already existed, and books and intellectual intercourse filled a large part of the leisure of men actively engaged in affairs. Even oratory was intended quite as much for readers as for the audiences to which it was immediately addressed; and some of the greatest speeches which have come down from that great age of orators were never delivered at all, but were published as manifestoes after the event with the view of influencing educated opinion, and as works of art with the view of giving pleasure to educated taste.

Thus the speeches of M. Tullius Cicero (106-43) belong to the domain of literature quite as much as to that of forensic or political oratory. And, although Demosthenes is a master of style unrivalled even by Cicero, the literary interest of most of Cicero's speeches is stronger than that of the great mass of Greek oratory. It is urged with justice that the greater part of Cicero's *Defence of Archias* was irrelevant to the issue and would not have been listened to by a Greek court of justice or a modern jury. But it was fortunate for the interests of literature that a court of educated Romans could be influenced by the considerations there submitted to them. In this way a question of the most temporary interest, concerning an individual of no particular eminence or importance, has produced one of the most impressive vindications of literature ever spoken or written. Oratory at Rome assumed a new type from being cultivated as an art which endeavoured to produce persuasion not so much by intellectual conviction, as by appeal to general human sympathies. In oratory, as in every other intellectual province, the Greeks had a truer sense of the limits and conditions of their art. But command over form is only one element in the making of an orator or poet. The largeness and dignity of the matter with which he has to deal are at least as important. The Roman oratory of the law courts had to deal not with petty questions of disputed property, of fraud, or violence, but with great imperial questions, with matters affecting the well-being of large provinces and the honour and safety of the republic; and no man ever lived who, in these respects, was better fitted than Cicero to be the representative of the type of oratory demanded by the condition of the later republic. To his great artistic accomplishment, perfected by practice and elaborate study, to the power of his patriotic, his moral, and personal sympathies, and his passionate emotional nature, must be added his vivid imagination and the rich and copious stream of his language, in which he had no rival among Roman writers or speakers. It has been said that Roman poetry has produced few, if any, great types of character. But the Verres, Catiline, Antony of Cicero are living and permanent types. The story told in the *Pro Cluentio* may be true or false, but the picture of provincial crime which it presents is vividly dramatic. Had we only known Cicero in his speeches we should have ranked him with Demosthenes as one who had realized the highest literary ideal. We should think of him also as the creator and master of Latin style—and, moreover, not only as a great orator but as a just and appreciative critic of oratory. But to his services to Roman oratory we have to add his services not indeed to philosophy but to the literature of philosophy. Though not a philosopher he is an admirable interpreter of those branches of philosophy which are fitted for practical application, and he presents us with the results of Greek reflection vivified by his own human sympathies and his large experience of men. In giving a model of the style in which human interest can best be imparted to abstract discussions, he used his great oratorical gift and art to persuade the world to accept the most hopeful opinions on human destiny and the principles of conduct most conducive to elevation and integrity of character.

***Cicero.***



The *Letters* of Cicero are thoroughly natural—*colloquia absentium amicorum*, to use his own phrase. Cicero's letters to Atticus, and to the friends with whom he was completely at his ease, are the most sincere and immediate expression of the thought and feeling of the moment. They let us into the secret of his most serious thoughts and cares, and they give a natural outlet to his vivacity of observation, his wit and humour, his kindliness of nature. It shows how flexible an instrument Latin prose had become in his hand, when it could do justice at once to the ample and vehement volume of his oratory, to the calmer and more rhythmical movement of his philosophical meditation, and to the natural interchange of thought and feeling in the everyday intercourse of life.

Among the many rival orators of the age the most eminent were Quintus Hortensius Ortalus and C. Julius Caesar. The former was the leading representative of the Asiatic or florid style of oratory, and, like other members of the aristocracy, such as C. Memmius and L. Manlius Torquatus, and like Q. Catulus in the preceding generation, was a kind of dilettante poet and a precursor of the poetry of pleasure, which attained such prominence in the elegiac poets of the Augustan age. Of C. Julius Caesar (102-44) as an orator we can judge only by his reputation and by the testimony of his great rival and adversary Cicero; but we are able to appreciate the special praise of perfect taste in the use of language attributed to him.[1] In his *Commentaries*, by laying aside the ornaments of oratory, he created the most admirable style of prose narrative, the style which presents interesting events in their sequence of time and dependence on the will of the actor, rapidly and vividly, with scarcely any colouring of personal or moral feeling, any oratorical passion, any pictorial illustration. While he shows the persuasive art of an orator by presenting the subjugation of Gaul and his own action in the Civil War in the light most favourable to his claim to rule the Roman world, he is entirely free from the Roman fashion of self-laudation or disparagement of an adversary. The character of the man reveals itself

***Caesar.***

especially in a perfect simplicity of style, the result of the clearest intelligence and the strongest sense of personal dignity. He avoids not only every unusual but every superfluous word; and, although no writing can be more free from rhetorical colouring, yet there may from time to time be detected a glow of sympathy, like the glow of generous passion in Thucydides, the more effective from the reserve with which it betrays itself whenever he is called on to record any act of personal heroism or of devotion to military duty.

**Sallust.**

In the simplicity of his style, the directness of his narrative, the entire absence of any didactic tendency, Caesar presents a marked contrast to another prose writer of that age—the historian C. Sallustius Crispus or Sallust (*c.* 87-36). Like Varro, he survived Cicero by some years, but the tone and spirit in which his works are written assign him to the republican era. He was the first of the purely artistic historians, as distinct from the annalists and the writers of personal memoirs. He imitated the Greek historians in taking particular actions—the *Jugurthan War* and the *Catilinarian Conspiracy*—as the subjects of artistic treatment. He wrote also a continuous work, *Historiae*, treating of the events of the twelve years following the death of Sulla, of which only fragments are preserved. His two extant works are more valuable as artistic studies of the rival parties in the state and of personal character than as trustworthy narratives of facts. His style aims at effectiveness by pregnant expression, sententiousness, archaism. He produces the impression of caring more for the manner of saying a thing than for its truth. Yet he has great value as a painter of historical portraits, some of them those of his contemporaries, and as an author who had been a political partisan and had taken some part in making history before undertaking to write it; and he gives us, from the popular side, the views of a contemporary on the politics of the time. Of the other historians, or rather annalists, who belong to this period, such as Q. Claudius Quadrigarius, Q. Valerius Antias, and C. Licinius Macer, the father of Calvus, we have only fragments remaining.

**Varro.**

The period was also remarkable for the production of works which we should class as technical or scientific rather than literary. The activity of one of these writers was so great that he is entitled to a separate mention. This was M. Terentius Varro, the most learned not only of the Romans but of the Greeks, as he has been called. The list of Varro's writings includes over seventy treatises and more than six hundred books dealing with topics of every conceivable kind. His *Menippeae Saturae*, miscellanies in prose and verse, of which unfortunately only fragments are left, was a work of singular literary interest.

**Lucretius.**

Since the *Annals* of Ennius no great and original poem had appeared. The powerful poetical force which for half a century continued to be the strongest force in literature, and which created masterpieces of art and genius, first revealed itself in the latter part of the Ciceronian age. The conditions which enabled the poetic genius of Italy to come to maturity in the person of T. Lucretius Carus (96-55) were entire seclusion from public life and absorption in the ideal pleasures of contemplation and artistic production. This isolation from the familiar ways of his contemporaries, while it was, according to tradition and the internal evidence of his poem, destructive to his spirit's health, resulted in a work of genius, unique in character, which still stands forth as the greatest philosophical poem in any language. In the form of his poem he followed a Greek original; and the stuff out of which the texture of his philosophical argument is framed was derived from Greek science; but all that is of deep human and poetical meaning in the poem is his own. While we recognize in the *De Rerum Natura* some of the most powerful poetry in any language and feel that few poets have penetrated with such passionate sincerity and courage into the secret of nature and some of the deeper truths of human life, we must acknowledge that, as compared with the great didactic poem of Virgil, it is crude and unformed in artistic design, and often rough and unequal in artistic execution. Yet, apart altogether from its independent value, by his speculative power and enthusiasm, by his revelation of the life and spectacle of nature, by the fresh creativeness of his diction and the elevated movement of his rhythm, Lucretius exercised a more powerful influence than any other on the art of his more perfect successors.

**Catullus.**

While the imaginative and emotional side of Roman poetry was so powerfully represented by Lucretius, attention was directed to its artistic side by a younger generation, who moulded themselves in a great degree on Alexandrian models. Such were Valerius Cato also a distinguished literary critic, and C. Licinius Calvus, an eminent orator. Of this small group of poets one only has survived, fortunately the man of most genius among them, the bosom-friend of Calvus, C. Valerius Catullus (84-54). He too was a new force in Roman literature. He was a provincial by birth, although early brought into intimate relations with members of the great Roman families.

The subjects of his best art are taken immediately from his own life—his loves, his friendships, his travels, his animosities, personal and political. His most original contribution to the substance of Roman literature was that he first shaped into poetry the experience of his own heart, as it had been shaped by Alcaeus and Sappho in the early days of Greek poetry. No poet has surpassed him in the power of vitally reproducing the pleasure and pain of the passing hour, not recalled by idealizing reflection as in Horace, nor overlaid with mythological ornament as in Propertius, but in all the keenness of immediate impression. He also introduced into Roman literature that personal as distinct from political or social satire which appears later in the *Epodes* of Horace and the *Epigrams* of Martial. He anticipated Ovid in recalling the stories of Greek mythology to a second poetical life. His greatest contribution to poetic art consisted in the perfection which he attained in the phalaecian, the pure iambic, and the scazon metres, and in the ease and grace with which he used the language of familiar intercourse, as distinct from that of the creative imagination, of the *rostra*, and of the schools, to give at once a lifelike and an artistic expression to his feelings. He has the interest of being the last poet of the free republic. In his life and in his art he was the precursor of those poets who used their genius as the interpreter and minister of pleasure; but he rises above them in the spirit of personal independence, in his affection for his friends, in his keen enjoyment of natural and simple pleasures, and in his power of giving vital expression to these feelings.



### *Third Period: Augustan Age, 42 B.C. to A.D. 17.*

The poetic impulse and culture communicated to Roman literature in the last years of the republic passed on without any break of continuity into the literature of the succeeding age. One or two of the circle of Catullus survived into that age; but an entirely new spirit came over the literature of the new period, and it is by new men, educated indeed under the same literary influences, but living in an altered world and belonging originally to a different order in the state, that the new spirit was expressed. The literature of the later republic reflects the sympathies and prejudices of an aristocratic class, sharing in the conduct of national affairs and living on terms of equality with one another; that of the Augustan age, first in its early serious enthusiasm, and then in the licence and levity of its later development, represents the hopes and aspirations with which the new monarchy was ushered into the world, and the pursuit of pleasure and amusement, which becomes the chief interest of a class cut off from the higher energies of practical life, and moving in the refining and enervating atmosphere of an imperial court. The great inspiring influence of the new literature was the enthusiasm produced first by the hope and afterwards by the fulfilment of the restoration of peace, order, national glory, under the rule of Augustus. All that the age longed for seemed to be embodied in a man who had both in his own person and by inheritance the natural spell which sways the imagination of the world. The sentiment of hero-worship was at all times strong in the Romans, and no one was ever the object of more sincere as well as simulated hero-worship than Augustus. It was not, however, by his equals in station that the first feeling was likely to be entertained. The earliest to give expression to it was Virgil; but the spell was soon acknowledged by the colder and more worldly-wise Horace. The disgust aroused by the anti-national policy of Antony, and the danger to the empire which was averted by the result of the battle of Actium, combined with the confidence inspired by the new ruler to reconcile the great families as well as the great body of the people to the new order of things.

***Influence of imperial institutions.***

While the establishment of the empire produced a revival of national and imperial feeling, it suppressed all independent political thought and action. Hence the two great forms of prose literature which drew their nourishment from the struggles of political life, oratory and contemporary history, were arrested in their development. The main course of literature was thus for a time diverted into poetry. That poetry in its most elevated form aimed at being the organ of the new empire and of realizing the national ideals of life and character under its auspices; and in carrying out this aim it sought to recall the great memories of the past. It became also the organ of the pleasures and interests of private life, the chief motives of which were the love of nature and the passion of love. It sought also to make the art and poetry of Greece live a new artistic life. Satire, debarred from comment on political action, turned to social and individual life, and combined with the newly-developed taste for ethical analysis and reflection introduced by Cicero. One great work had still to be done in prose—a retrospect of the past history of the state from an idealizing and romanticizing point of view. For that work the Augustan age, as the end of one great cycle of events and the beginning of another, was eminently suited, and a writer who, by his gifts of imagination and sympathy,

was perhaps better fitted than any other man of antiquity for the task, and who through the whole of this period lived a life of literary leisure, was found to do justice to the subject.

Although the age did not afford free scope and stimulus to individual energy and enterprise, it furnished more material and social advantages for the peaceful cultivation of letters. The new influence of patronage, which in other times has chilled the genial current of literature, become, in the person of Maecenas, the medium through which literature and the imperial policy were brought into union. Poetry thus acquired the tone of the world, kept in close connexion with the chief source of national life, while it was cultivated to the highest pitch of artistic perfection under the most favourable conditions of leisure and freedom from the distractions and anxieties of life.

***Virgil.***

The earliest in the order of time of the poets who adorn this age—P. Vergilius Maro or Virgil (70-19)—is also the greatest in genius, the most richly cultivated, and the most perfect in art. He is the idealizing poet of the hopes and aspirations and of the purer and happier life of which the age seemed to contain the promise. He elevates the present by associating it with the past and future of the world, and sanctifies it by seeing in it the fulfilment of a divine purpose. Virgil is the true representative poet of Rome and Italy, of national glory and of the beauty of nature, the artist in whom all the efforts of the past were made perfect, and the unapproachable standard of excellence to future times. While more richly endowed with sensibility to all native influences, he was more deeply imbued than any of his contemporaries with the poetry, the thought and the learning of Greece. The earliest efforts of his art (the *Eclogues*) reproduce the cadences, the diction and the pastoral fancies of Theocritus; but even in these imitative poems of his youth Virgil shows a perfect mastery of his materials. The Latin hexameter, which in Ennius and Lucretius was the organ of the more dignified and majestic emotions, became in his hands the most perfect measure in which the softer and more luxurious sentiment of nature has been expressed. The sentiment of Italian scenery and the love which the Italian peasant has for the familiar sights and sounds of his home found a voice which never can pass away.

In the *Georgics* we are struck by the great advance in the originality and self-dependence of the artist, in the mature perfection of his workmanship, in the deepening and strengthening of all his sympathies and convictions. His genius still works under forms prescribed by Greek art, and under the disadvantage of having a practical and utilitarian aim imposed on it. But he has ever in form so far surpassed his originals that he alone has gained for the pure didactic poem a place among the highest forms of serious poetry, while he has so transmuted his material that, without violation of truth, he has made the whole poem alive with poetic feeling. The homeliest details of the farmer’s work are transfigured through the poet’s love of nature; through his religious feeling and his pious sympathy with the sanctities of human affection; through his patriotic sympathy with the national greatness; and through the rich allusiveness of his art to everything in poetry and legend which can illustrate and glorify his theme.

In the *Eclogues* and *Georgics* Virgil is the idealizing poet of the old simple and hardy life of Italy, as the imagination could conceive of it in an altered world. In the *Aeneid* he is the idealizing poet of national glory, as manifested in the person of Augustus. The epic of national life, vividly conceived but rudely executed by Ennius, was perfected in the years that followed the decisive victory at Actium. To do justice to his idea Virgil enters into rivalry with a greater poet than those whom he had equalled or surpassed in his previous works. And, though he cannot unroll before us the page of heroic action with the power and majesty of Homer, yet by the sympathy with which he realizes the idea of Rome, and by the power with which he has used the details of tradition, of local scenes, of religious usage, to embody it, he has built up in the form of an epic poem the most enduring and the most artistically constructed monument of national grandeur.



***Horace.***

The second great poet of the time—Q. Horatius Flaccus or Horace (68-8) is both the realist and the idealist of his age. If we want to know the actual lives, manners and ways of thinking of the Romans of the generation succeeding the overthrow of the republic it is in the *Satires* and partially in the *Epistles* of Horace that we shall find them. If we ask what that time provided to stir the fancy and move the mood of imaginative reflection, it is in the lyrical poems of Horace that we shall find the most varied and trustworthy answer. His literary activity extends over about thirty years and naturally divides itself into three periods, each marked by a distinct character. The first—extending from about 40 to 29—is that of the *Epodes* and *Satires*. In the former he imitates the Greek poet Archilochus, but takes his subjects from the men, women and incidents of the day. Personality is the essence of his *Epodes*; in the *Satires* it is used merely as illustrative of

general tendencies. In the *Satires* we find realistic pictures of social life, and the conduct and opinions of the world submitted to the standard of good feeling and common sense. The style of the *Epodes* is pointed and epigrammatic, that of the *Satires* natural and familiar. The hexameter no longer, as in Lucilius, moves awkwardly as if in fetters, but, like the language of Terence, of Catullus in his lighter pieces, of Cicero in his letters to Atticus, adapts itself to the everyday intercourse of life. The next period is the meridian of his genius, the time of his greatest lyrical inspiration, which he himself associates with the peace and leisure secured to him by his Sabine farm. The life of pleasure which he had lived in his youth comes back to him, not as it was in its actual distractions and disappointments, but in the idealizing light of meditative retrospect. He had not only become reconciled to the new order of things, but was moved by his intimate friendship with Maecenas to aid in raising the world to sympathy with the imperial rule through the medium of his lyrical inspiration, as Virgil had through the glory of his epic art. With the completion of the three books of *Odes* he cast aside for a time the office of the *vates*, and resumed that of the critical spectator of human life, but in the spirit of a moralist rather than a satirist. He feels the increasing languor of the time as well as the languor of advancing years, and seeks to encourage younger men to take up the rôle of lyrical poetry, while he devotes himself to the contemplation of the true art of living. Self-culture rather than the fulfilment of public or social duty, as in the moral teaching of Cicero, is the aim of his teaching; and in this we recognize the influence of the empire in throwing the individual back on himself. As Cicero tones down his oratory in his moral treatises, so Horace tones down the fervour of his lyrical utterances in his *Epistles*, and thus produces a style combining the ease of the best epistolary style with the grace and concentration of poetry—the style, as it has been called, of "idealized common sense," that of the *urbanus* and cultivated man of the world who is also in his hours of inspiration a genuine poet. In the last ten years of his life Horace resumed his lyrical function for a time, under pressure of the imperial command, and produced some of the most exquisite and mature products of his art. But his chief activity is devoted to criticism. He first vindicates the claims of his own age to literary pre-eminence, and then seeks to stimulate the younger writers of the day to what he regarded as the manlier forms of poetry, and especially to the tragic drama, which seemed for a short time to give promise of an artistic revival.

But the poetry of the latter half of the Augustan age destined to survive did not follow the lines either of lyrical or of dramatic art marked out by Horace. The latest form of poetry adopted from Greece and destined to gain and permanently to hold the ear of the world was the *elegy*. From the time of Mimnermus this form seems to have presented itself as the most natural vehicle for the poetry of pleasure in an age of luxury, refinement and incipient decay. Its facile flow and rhythm seem to adapt it to the expression and illustration of personal feeling. It goes to the mind of the reader through a medium of sentiment rather than of continuous thought or imaginative illustration. The greatest masters of this kind of poetry are the elegiac poets of the Augustan age—Tibullus, Propertius and Ovid.

Of the ill-fated C. Cornelius Gallus, their predecessor, we have but a single pentameter remaining. Of the three Tibullus (*c.* 54-19) is the most refined and tender. As the poet of love he gives utterance to the pensive melancholy rather than to the pleasures associated with it. In his sympathy with the life and beliefs of the country people he shows an affinity both to the idyllic spirit and to the piety of Virgil. There is something, too, in his fastidious refinement and in his shrinking from the rough contact of life that reminds us of the English poet Gray.

***Tibullus]***

A poet of more strength and more powerful imagination, but of less refinement in his life and less exquisite taste in his art, is Sextus Propertius (*c.* 50-*c.* 15). His youth was a more stormy one than that of Tibullus, and was passed, not like his, among the "healthy woods" of his country estate, but amid all the licence of the capital. His passion for Cynthia, the theme of his most finished poetry, is second only in interest to that of Catullus for Lesbia; and Cynthia in her fascination and caprices seems a more real and intelligible personage than the idealized object first of the idolatry and afterwards of the malediction of Catullus. Propertius is a less accomplished artist and a less equably pleasing writer than either Tibullus or Ovid, but he shows more power of dealing gravely with a great or tragic situation than either of them, and his diction and rhythm give frequent proof of a concentrated force of conception and a corresponding movement of imaginative feeling which remind us of Lucretius.

***Propertius.***

The most facile and brilliant of the elegiac poets and the least serious in tone and spirit is P. Ovidius Naso or Ovid (43 B.C.-A.D. 18). As an amatory poet he is the poet of pleasure and intrigue rather than of tender sentiment or absorbing passion. Though he treated his subject in relation to himself with more levity and irony than

***Ovid.***

real feeling, yet by his sparkling wit and fancy he created a literature of sentiment and adventure adapted to amuse the idle and luxurious society of which the elder Julia was the centre. His power of continuous narrative is best seen in the *Metamorphoses*, written in hexameters to which he has imparted a rapidity and precision of movement more suited to romantic and picturesque narrative than the weighty self-restrained verse of Virgil. In his *Fasti* he treats a subject of national interest; it is not, however, through the strength of Roman sentiment but through the power of vividly conceiving and narrating stories of strong human interest that the poem lives. In his latest works—the *Tristia* and *Ex Ponto*—he imparts the interest of personal confessions to the record of a unique experience. Latin poetry is more rich in the expression of personal feeling than of dramatic realism. In Ovid we have both. We know him in the intense liveliness of his feeling and the human weakness of his nature more intimately than any other writer of antiquity, except perhaps Cicero. As Virgil marks the point of maturest excellence in poetic diction and rhythm, Ovid marks that of the greatest facility.

***Livy.***

The Augustan age was one of those great eras in the world like the era succeeding the Persian War in Greece, the Elizabethan age in England, and the beginning of the 19th century in Europe, in which what seems a new spring of national and individual life calls out an idealizing retrospect of the past. As the present seems full of new life, the past seems rich in glory and the future in hope. The past of Rome had always a peculiar fascination for Roman writers. Virgil in a supreme degree, and Horace, Propertius and Ovid in a less degree, had expressed in their poetry the romance of the past. But it was in the great historical work of T. Livius or Livy (59 B.C.-A.D. 17) that the record of the national life received its most systematic exposition. Its execution  was the work of a life prolonged through the languor and dissolution following so soon upon the promise of the new era, during which time the past became glorified by contrast with the disheartening aspect of the present. The value of the work consists not in any power of critical investigation or weighing of historical evidence but in the intense sympathy of the writer with the national ideal, and the vivid imagination with which under the influence of this sympathy he gives life to the events and personages, the wars and political struggles, of times remote from his own. He makes us feel more than any one the majesty of the Roman state, of its great magistracies, and of the august council by which its policy was guided. And, while he makes the words *senatus populusque Romanus* full of significance for all times, no one realizes with more enthusiasm all that is implied in the words *imperium Romanum*, and the great military qualities of head and heart by which that empire was acquired and maintained. The vast scale on which the work was conceived and the thoroughness of artistic execution with which the details are finished are characteristically Roman. The prose style of Rome, as a vehicle for the continuous narration of events coloured by a rich and picturesque imagination and instinct with dignified emotion, attained its perfection in Livy.

### *Fourth Period: The Silver Age, from A.D. 17 to about 130.*

***Characteristics of post-Augustan age.***

For more than a century after the death of Augustus Roman literature continues to flow in the old channels. Though drawing from the provinces, Rome remains the centre of the literary movement. The characteristics of the great writers are essentially national, not provincial nor cosmopolitan. In prose the old forms—oratory, history, the epistle, treatises or dialogues on ethical and literary questions—continue to be cultivated. Scientific and practical subjects, such as natural history, architecture, medicine, agriculture, are treated in more elaborate literary style. The old Roman *satura* is developed into something like the modern prose novel. In the various provinces of poetry, while there is little novelty or inspiration, there is abundance of industry and ambitious effort. The national love of works of large compass shows itself in the production of long epic poems, both of the historic and of the imitative Alexandrian type. The imitative and rhetorical tastes of Rome showed themselves in the composition of exotic tragedies, as remote in spirit and character from Greek as from Roman life, of which the only extant specimens are those attributed to the younger Seneca. The composition of didactic, lyrical and elegiac poetry also was the accomplishment and pastime of an educated dilettante class, the only extant specimens of any interest being some of the *Silvae* of Statius. The only voice with which the poet of this age can express himself with force and sincerity is that of satire and satiric epigram. We find now only imitative echoes of the old music created by Virgil and others, as in Statius, or powerful declamation, as in Lucan and Juvenal. There is a deterioration in the diction as well as in the music of poetry. The elaborate literary culture of the Augustan age has done

something to impair the native force of the Latin idiom. The language of literature, in the most elaborate kind of prose as well as poetry, loses all ring of popular speech. The old oratorical tastes and aptitudes find their outlet in public recitations and the practice of declamation. Forced and distorted expression, exaggerated emphasis, point and antithesis, an affected prettiness, are studied with the view of gaining the applause of audiences who thronged the lecture and recitation rooms in search of temporary excitement. Education is more widely diffused, but is less thorough, less leisurely in its method, derived less than before from the purer sources of culture. The precocious immaturity of Lucan's career affords a marked contrast to the long preparation of Virgil and Horace for their high office. Although there are some works of this so-called Silver Age of considerable and one at least of supreme interest, from the insight they afford into the experience of a century of organized despotism and its effect on the spiritual life of the ancient world, it cannot be doubted that the steady literary decline which characterized the last centuries of paganism was beginning before the death of Ovid and Livy.

The influences which had inspired republican and Augustan literature were the artistic impulse derived from a familiarity with the great works of Greek genius, becoming more intimate with every new generation, the spell of Rome over the imagination of the kindred Italian races, the charm of Italy, and the vivid sensibility of the Italian temperament. These influences were certainly much less operative in the first century of the empire. The imitative impulse, which had much of the character of a creative impulse, and had resulted in the appropriation of the forms of poetry suited to the Roman and Italian character and of the metres suited to the genius of the Latin language, no longer stimulated to artistic effort. The great sources of Greek poetry were no longer regarded, as they were by Lucretius and Virgil, as sacred, untasted springs, to be approached in a spirit of enthusiasm tempered with reverence. We have the testimony of two men of shrewd common sense and masculine understanding—Martial and Juvenal—to the stale and lifeless character of the art of the Silver Age, which sought to reproduce in the form of epics, tragedies and elegies the bright fancies of the Greek mythology.

The idea of Rome, owing to the antagonism between the policy of the government and the sympathies of the class by which literature was favoured and cultivated, could no longer be an inspiring motive, as it had been in the literature of the republic and of the Augustan age. The spirit of Rome appears only as animating the protest of Lucan, the satire of Persius and Juvenal, the sombre picture which Tacitus paints of the annals of the empire. Oratory is no longer an independent voice appealing to sentiments of Roman dignity, but the weapon of the "informers" (*delatores*), wielded for their own advancement and the destruction of that class which, even in their degeneracy, retained most sympathy with the national traditions. Roman history was no longer a record of national glory, stimulating the patriotism and flattering the pride of all Roman citizens, but a personal eulogy or a personal invective, according as servility to a present or hatred of a recent ruler was the motive which animated it.

The charm of Italian scenes still remained the same, but the fresh and inspiring feeling cf nature gave place to the mere sensuous gratification derived from the luxurious and artificial beauty of the country villa. The idealizing poetry of passion, which found a genuine voice in Catullus and the elegiac poets, could not prolong itself through the exhausting licence of successive generations. The vigorous vitality which gives interest to the personality of Catullus, Propertius and Ovid no longer characterizes their successors. The pathos of natural affection is occasionally recognized in Statius and more rarely in Martial, but it has not the depth of tenderness found in Lucretius and Virgil. The wealth and luxury of successive generations, the monotonous routine of life, the separation of the educated class from the higher work of the world, have produced their enervating and paralysing effect on the mainsprings of poetic and imaginative feeling.

***New literary elements.***

New elements, however, appear in the literature of this period. As the result of the severance from the active interests of life, a new interest is awakened in the inner life of the individual. The immorality of Roman society not only affords abundant material to the satirist, but deepens the consciousness of moral evil in purer and more thoughtful minds. To these causes we attribute the pathological observation of Seneca and Tacitus, the new sense of purity in Persius called out by contrast with the impurity around him, the glowing if somewhat sensational exaggeration of Juvenal, the vivid characterization of Martial. The literature of no time presents so powerfully the contrast between moral good and evil. In this respect it is truly representative of the life of the age. Another new element is the influence of a new race. In the two preceding periods the rapid diffusion of literary culture following the Social War and

the first Civil War was seen to awaken into new life the elements of original genius in Italy and Cisalpine Gaul. In the first century of the empire a similar result was produced by the diffusion of that culture in the Latinized districts of Spain. The fervid temperament of a fresh and vigorous race, which received the Latin discipline just as Latium had two or three centuries previously received the Greek discipline, revealed itself in the writings of the Senecas, Lucan, Quintilian, Martial and others, who in their own time added literary distinction to the Spanish towns from which they came. The new extraneous element introduced into Roman literature draws into greater prominence the characteristics of the last great representatives of the genuine Roman and Italian spirit—the historian Tacitus and the satirist Juvenal.

On the whole this century shows, in form, language and substance, the signs of literary decay. But it is still capable of producing men of original force; it still maintains the traditions of a happier time; it is still alive to the value of literary culture, and endeavours by minute attention to style to produce new effects. Though it was not one of the great eras in the annals of literature, yet the century which produced Martial, Juvenal and Tacitus cannot be pronounced barren in literary originality, nor that which produced Seneca and Quintilian devoid of culture and literary taste.

This fourth period is itself subdivided into three divisions: (1) from the accession of Tiberius to the death of Nero, 68—the most important part of it being the Neronian age, 54 to 68; (2) the Flavian era, from the death of Nero to the death of Domitian, 96; (3) the reigns of Nerva and Trajan and part of the reign of Hadrian.

1. For a generation after the death of Augustus no new original literary force appeared. The later poetry of the Augustan age had ended in trifling dilettantism, for the continuance of which the atmosphere of the court was no longer favourable. The class by which literature was encouraged had become both enervated and terrorized. The most remarkable poetical product of the time is the long-neglected astrological poem of Manilius which was written at the beginning of Tiberius's reign. Its vigour and originality have had scanty justice done to them owing to the difficulty of the subject-matter and the style, and the corruptions which still disfigure its text. Very different has been the fate of the *Fables* of Phaedrus. This slight work of a Macedonian freedman, destitute of national significance and representative in its morality only of the spirit of cosmopolitan individualism, owes its vogue to its easy Latinity and popular subject-matter. Of the prose writers C. Velleius Paterculus, the historian, and Valerius Maximus, the collector of anecdotes, are the most important. A. Cornelius Celsus composed a series of technical handbooks, one of which, upon medicine, has survived. Its purity of style and the fact that it was long a standard work entitle it to a mention here. The traditional culture was still, however, maintained, and the age was rich in grammarians and rhetoricians. The new profession of the *delator* must have given a stimulus to oratory. A high ideal of culture, literary as well as practical, was realized in Germanicus, which seems to have been transmitted to his daughter Agrippina, whose patronage of Seneca had important results in the next generation. The reign of Claudius was a time in which antiquarian learning, grammatical studies, and jurisprudence were cultivated, but no important additions were made to literature. A fresh impulse was given to letters on the accession of Nero, and this was partly due to the theatrical and artistic tastes of the young emperor. Four writers of the Neronian age still possess considerable interest,—L. Annaeus Seneca, M. Annaeus Lucanus, A. Persius Flaccus and Petronius Arbiter. The first three represent the spirit of their age by exhibiting the power of the Stoic philosophy as a moral, political and religious force; the last is the most cynical exponent of the depravity of the time. Seneca (*c.* 5 B.C.-A.D. 65) is less than Persius a pure Stoic, and more of a moralist and pathological observer of man's inner life. He makes the commonplaces of a cosmopolitan philosophy interesting by his abundant illustration drawn from the private and social life of his contemporaries. He has knowledge of the world, the suppleness of a courtier, Spanish vivacity, and the *ingenium amoenum* attributed to him by Tacitus, the fruit of which is sometimes seen in the "honeyed phrases" mentioned by Petronius—pure aspirations combined with inconsistency of purpose—the inconsistency of one who tries to make the best of two worlds, the ideal inner life and the successful real life in the atmosphere of a most corrupt court. The *Pharsalia* of Lucan (39-65), with Cato as its hero, is essentially a Stoic manifesto of the opposition. It is written with the force and fervour of extreme youth and with the literary ambition of a race as yet new to the discipline of intellectual culture, and is characterized by rhetorical rather than poetical imagination. The six short *Satires* of Persius (34-62) are the purest product of Stoicism—a Stoicism that had found in a contemporary, Thrasea, a more rational and practical hero than Cato. But no important writer of antiquity has less literary charm than Persius. In avoiding the literary conceits and

***Period from Tiberius to Nero.***

fopperies which he satirizes he has recourse to the most unnatural contortions of expression. Of hardly greater length are the seven eclogues of T. Calpurnius Siculus, written at the beginning of the reign of Nero, which are not without grace and facility of diction. Of the works of the time that which from a human point of view is perhaps the most detestable in ancient literature has the most genuine literary quality, the fragment of a prose novel—the *Satyricon*—of Petronius (d. 66). It is most sincere in its representation, least artificial in diction, most penetrating in its satire, most just in its criticism of art and style.

2. A greater sobriety of tone was introduced both into life and literature with the accession of Vespasian. The time was, however, characterized rather by good sense and industry than by original genius. Under Vespasian C. Plinius Secundus, or Pliny the elder (compiler of the *Natural History*, an encyclopaedic treatise, 23-79), is the most important prose writer, and C. Valerius Flaccus Setinus Balbus, author of the *Argonautica* (d. *c*. 90), the most important among the writers of poetry. The reign of Domitian, although it silenced the more independent spirits of the time, Tacitus and Juvenal, witnessed more important contributions to Roman literature than any age since the Augustan,—among them the *Institutes* of Quintilian, the *Punic War* of Silius Italicus, the epics and the *Silvae* of Statius, and the *Epigrams* of Martial. M. Fabius Quintilianus, or Quintilian (*c.* 35-95), is brought forward by Juvenal as a unique instance of a thoroughly successful man of letters, of one not belonging by birth to the rich or official class, who had risen to wealth and honours through literature. He was well adapted to his time by his good sense and sobriety of judgment. His criticism is just and true rather than subtle or ingenious, and has thus stood the test of the judgment of after-times. The poem of Ti. Catius Silius Italicus (25-101) is a proof of the industry and literary ambition of members of the rich official class. Of the epic poets of the Silver Age P. Papinius Statius (*c.* 45-96) shows the greatest technical skill and the richest pictorial fancy in the execution of detail; but his epics have no true inspiring motive, and, although the recitation of the *Thebaid* could attract and charm an audience in the days of Juvenal, it really belongs to the class of poems so unsparingly condemned both by him and Martial. In the *Silvae*, though many of them have little root in the deeper feelings of human nature, we find occasionally more than in any poetry after the Augustan age something of the purer charm and pathos of life. But it is not in the *Silvae*, nor in the epics and tragedies of the time, nor in the cultivated criticism of Quintilian that the age of Domitian lives for us. It is in the *Epigrams* of M. Valerius Martialis or Martial (*c*. 41-104) that we have a true image of the average sensual frivolous life of Rome at the end of the 1st century, seen through a medium of wit and humour, but undistorted by the exaggeration which moral indignation and the love of effect add to the representation of Juvenal. Martial represents his age in his *Epigrams*, as Horace does his in his *Satires* and *Odes*, with more variety and incisive force in his sketches, though with much less poetic charm and serious meaning. We know the daily life, the familiar personages, the outward aspect of Rome in the age of Domitian better than at any other period of Roman history, and this knowledge we owe to Martial.

***Age of Domitian.***



3. But it was under Nerva and Trajan that the greatest and most truly representative works of the empire were written. The *Annals* and *Histories* of Cornelius Tacitus (54-119), with the supplementary *Life of Agricola* and the *Germania*, and the *Satires* of D. Iunius Iuvenalis or Juvenal (*c.* 47-130), sum up for posterity the moral experience of the Roman world from the accession of Tiberius to the death of Domitian. The generous scorn and pathos of the historian acting on extraordinary gifts of imaginative insight and characterization, and the fierce indignation of the satirist finding its vent in exaggerating realism, doubtless to some extent warped their impressions; nevertheless their works are the last voices expressive of the freedom and manly virtue of the ancient world. In them alone among the writers of the empire the spirit of the Roman republic seems to revive. The *Letters* of C. Plinius Caecilius Secundus or Pliny the Younger (61-*c.* 115), though they do not contradict the representation of Tacitus and Juvenal regarded as an exposure of the political degradation and moral corruption of prominent individuals and classes, do much to modify the pervadingly tragic and sombre character of their representation.

***Period of Nerva, Trajan and Hadrian.***

With the death of Juvenal, the most important part of whose activity falls in the reign of Trajan, Latin literature as an original and national expression of the experience, character, and sentiment of the Roman state and empire, and as one of the great literatures of the world, may be considered closed.

*Later Writers.*

What remains to describe is little but death and decay. Poetry died first; the paucity of writings in verse is matched by their insignificance. For two centuries after Juvenal there are no names but those of Q. Serenus Sammonicus, with his pharmacopoeia in verse (*c.* 225), and M. Aurelius Olympius Nemesianus, who wrote a few feeble eclogues and (283) a dull piece on the training of dogs for the chase. Towards the middle of the 4th century we have Decimus Magnus Ausonius, a professor of Bordeaux and afterwards consul (379), whose style is as little like that of classical poetry as is his prosody. His *Mosella*, a detailed description of the river Moselle, is the least unattractive of his works. A little better is his contemporary, Rufius Festus Avienus, who made some free translations of astronomical and geographical poems in Greek. A generation later, in what might be called the expiring effort of Latin poetry, appeared two writers of much greater merit. The first is Claudius Claudianus (*c.* 400), a native of Alexandria and the court poet of the emperor Honorius and his minister Stilicho. Claudian may be properly styled the last of the poets of Rome. He breathes the old national spirit, and his mastery of classical idiom and versification is for his age extraordinary. Something of the same may be seen in Rutilius Namatianus, a Gaul by birth, who wrote in 416 a description of his voyage from the capital to his native land, which contains the most glowing eulogy of Rome ever penned by an ancient hand. Of the Christian "poets" only Aurelius Prudentius Clemens (*c.* 348-410) need be mentioned. He was well read in the ancient literature; but the task of embodying the Christian spirit in the classical form was one far beyond his powers.

***Claudian.***

The vitality of the prose literature was not much greater though its complete extinction was from the nature of the case impossible. The most important writer in the age succeeding Juvenal was the biographer C. Suetonius Tranquillus (*c.* 75-160), whose work is more valuable for its matter than its manner. His style is simple and direct, but has hardly any other merit. A little later the rise of M. Cornelius Fronto (*c.* 100-175), a native of Cirta, marks the beginning of an African influence. Fronto, a distinguished orator and intimate friend of the emperor M. Aurelius, broke away from the traditional Latin of the Silver and Golden ages, and took as his models the pre-classical authors. The reaction was short-lived; but the same affectation of antiquity is seen in the writings of Apuleius, also an African, who lived a little later than Fronto and was a man of much greater natural parts. In his *Metamorphoses*, which were based upon a Greek original, he takes the wonderful story of the adventures of Lucius of Madaura, and interweaves the famous legend of Cupid and Psyche. His bizarre and mystical style has a strange fascination for the reader; but there is nothing Roman or Italian about it. Two epitomists of previous histories may be mentioned: Justinus (of uncertain date) who abridged the history of Pompeius Trogus, an Augustan writer; and P. Annius Florus, who wrote in the reign of Hadrian a rhetorical sketch based upon Livy. The *Historia Augusta*, which includes the lives of the emperors from Hadrian to Numerianus (117-284), is the work of six writers, four of whom wrote under Diocletian and two under Constantine. It is a collection of personal memoirs of little historical importance, and marked by puerility and poverty of style. Ammianus Marcellinus (*c.* 330-400) had a higher conception of the historian's function. His narrative of the years 353-378 (all that now remains) is honest and straightforward, but his diction is awkward and obscure. The last pagan prose writer who need be mentioned is Q. Aurelius Symmachus (*c.* 350-410), the author of some speeches and a collection of letters. All the art of his ornate and courtly periods cannot disguise the fact that there was nothing now for paganism to say.

***Suetonius.***

***Apuleius.***

It is in Christian writers alone that we find the vigour of life. The earliest work of Christian apologetics is the *Octavius* or Minucius Felix, a contemporary of Fronto. It is written in pure Latin and is strongly tinged by classical influences. Quite different is the work of "the fierce Tertullian," Q. Septimius Florens Tertullianus (*c.* 150-230), a native of Carthage, the most vigorous of the Latin champions of the new faith. His style shows the African revolt of which we have already spoken, and in its medley of archaisms, Graecisms and Hebraisms reveals the strength of the disintegrating forces at work upon the Latin language. A more commanding figure is that of Aurelius Augustinus or St Augustine (354-430), bishop of Hippo, who for comprehensiveness and dialectical power stands out in the same way as Hieronymus or St Jerome (*c.* 331 or 340-420), a native of Stridon in Dalmatia, does for many-sided learning and scholarship.

***Christian writers.***

The decline of literature proper was attended by an increased output of grammatical and critical studies. From the time of L. Aelius Stilo Praeconinus, who was the teacher of Varro and Cicero, much interest had been taken in literary and linguistic problems at Rome. Varro under the republic, and M. Verrius Flaccus in the Augustan age, had busied themselves with lexicography and etymology. The

***Grammarians.***

grammarian M. Valerius Probus (*c.* A.D. 60) was the first critical editor of Latin texts. In the next century we have Velius Longus's treatise *De Orthographia*, and then a much more important work, the *Noctes Atticae* of Aulus Gellius, and (*c.* 200) a treatise in verse by Terentianus, an African, upon Latin pronunciation, prosody and metre. Somewhat later are the commentators on Terence and Horace, Helenius Acro and Pomponius Porphyrio. The tradition was continued in the 4th century by Nonius Marcellus and C. Marius Victorinus, both Africans; Aelius Donatus, the grammarian and commentator on Terence and Virgil, Flavius Sosipater Charisius and Diomedes, and Servius, the author of a valuable commentary on Virgil. Ambrosius Macrobius Theodosius (*c.* 400) wrote a treatise on Cicero's *Somnium Scipionis* and seven books of miscellanies (*Saturnalia*); and Martianus Capella (*c.* 430), a native of Africa, published a compendium of the seven liberal arts, written in a mixture of prose and verse, with some literary pretensions. The last grammarian who need be named is the most widely known of all, the celebrated Priscianus, who published his text-book at Constantinople probably in the middle of the 5th century.

***Jurists.***

In jurisprudence, which may be regarded as one of the outlying regions of literature, Roman genius had had some of its greatest triumphs, and, if we take account of the "codes," was active to the end. The most distinguished of the early jurists (whose works are lost) were Q. Mucius Scaevola, who died in 82 B.C., and following him Ser. Sulpicius Rufus, who died in 43 B.C. In the Augustan age M. Antistius Labeo and C. Ateius Capito headed two opposing schools in jurisprudence, Labeo being an advocate of method and reform, and Capito being a conservative and empiricist. The strife, which reflects the controversy between the "analogists" and the "anomalists" in philology, continued long after their death. Salvius Julianus was entrusted by Hadrian with the task of reducing into shape the immense mass of law which had grown up in the edicts of successive praetors—thus taking the first step towards a code. Sex. Pomponius, a contemporary, wrote an important legal manual of which fragments are preserved. The most celebrated handbook, however, is the *Institutiones* of Gaius, who lived under Antonius Pius—a model of what such treatises should be. The most eminent of all the Roman jurists was Aemilius Papinianus, the intimate friend of Septimius Severus; of his works only fragments remain. Other considerable writers were the prolific Domitius Ulpianus (*c.* 215) and Julius Paulus, his contemporary. The last juristical writer of note was Herennius Modestinus (*c.* 240). But though the line of great lawyers had ceased, the effects of their work remained and are clearly visible long after in the "codes"—the code of Theodosius (438) and the still more famous code of Justinian (529 and 533), with which is associated the name of Tribonianus.



BIBLIOGRAPHY.—The most full and satisfactory modern account of Latin literature is M. Schanz's *Geschichte der römischen Litteratur.* The best in English is the translation by C. C. Warr of W. S. Teuffel and L. Schwabe's *History of Roman Literature*. J. W. Mackail's short *History of Latin Literature* is full of excellent literary and aesthetic criticisms on the writers. C. Lamarre's *Histoire de la littérature latine* (1901, with specimens) only deals with the writers of the republic. W. Y. Sellar's *Roman Poets of the Republic and Poets of the Augustan Age*, and R. Y. Tyrrell's *Lectures on Latin Poetry*, will also be found of service. A concise account of the various Latin writers and their works, together with bibliographies, is given in J. E. B. Mayor's *Bibliographical Clue to Latin Literature* (1879), which is based on a German work by E. Hübner. See also the separate bibliographies to the articles on individual writers.

(W. Y. S.; J. P. P.)

1 *Latine loqui elegantissime*.

LATINUS, in Roman legend, king of the aborigines in Latium, and eponymous hero of the Latin race. In Hesiod (*Theogony*, 1013) he is the son of Odysseus and Circe, and ruler of the Tyrsenians; in Virgil, the son of Faunus and the nymph Marica, a national genealogy being substituted for the Hesiodic, which probably originated from a Greek source. Latinus was a shadowy personality, invented to explain the origin of Rome and its relations with Latium, and only obtained importance in later times through his legendary connexion with Aeneas and the foundation of Rome. According to Virgil (*Aeneid*, vii.-xii.), Aeneas, on landing at the mouth of the Tiber, was welcomed by Latinus, the peaceful ruler whose seat of

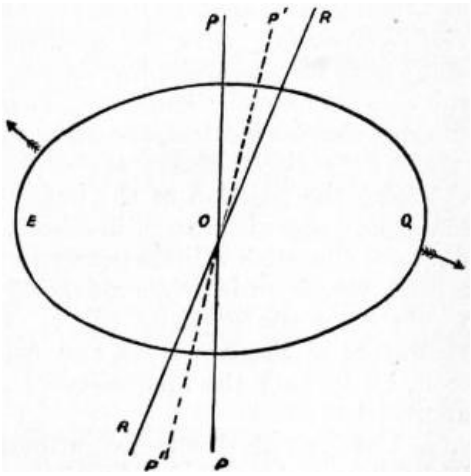
government was Laurentum, and ultimately married his daughter Lavinia.

Other accounts of Latinus, differing considerably in detail, are to be found in the fragments of Cato's *Origines* (in Servius's commentary on Virgil) and in Dionysius of Halicarnassus; see further authorities in the article by J. A. Hild, in Daremberg and Saglio, *Dictionnaire des antiquités*.

LATITUDE (Lat. *latitudo*, *latus*, broad), a word meaning breadth or width, hence, figuratively, freedom from restriction, but more generally used in the geographical and astronomical sense here treated. The latitude of a point on the earth's surface is its angular distance from the equator, measured on the curved surface of the earth. The direct measure of this distance being impracticable, it has to be determined by astronomical observations. As thus determined it is the angle between the direction of the plumb-line at the place and the plane of the equator. This is identical with the angle between the horizontal planes at the place and at the equator, and also with the elevation of the celestial pole above the horizon (see ASTRONOMY). Latitude thus determined by the plumb-line is termed *astronomical*. The *geocentric latitude* of a place is the angle which the line from the earth's centre to the place makes with the plane of the equator. *Geographical latitude*, which is used in mapping, is based on the supposition that the earth is an elliptic spheroid of known compression, and is the angle which the normal to this spheroid makes with the equator. It differs from the astronomical latitude only in being corrected for local deviation of the plumb-line.

The latitude of a celestial object is the angle which the line drawn from some fixed point of reference to the object makes with the plane of the ecliptic.

*Variability of Terrestrial Latitudes*.—The latitude of a point on the earth's surface, as above defined, is measured from the equator. The latter is defined by the condition that its plane makes a right angle with the earth's axis of rotation. It follows that if the points in which this axis intersects the earth's surface, *i.e.* the poles of the earth, change their positions on the earth's surface, the position of the equator will also change, and therefore the latitudes of places will change also. About the end of the 19th century research showed that there actually was a very minute but measurable periodic change of this kind. The north and south poles, instead of being fixed points on the earth's surface, wander round within a circle about 50 ft. in diameter. The result is a variability of terrestrial latitudes generally.




To show the cause of this motion, let BQ represent a section of an oblate spheroid through its shortest axis, PP. We may consider this spheroid to be that of the earth, the ellipticity being greatly exaggerated. If set in rotation around its axis of figure PP, it will continue to rotate around that axis for an indefinite time. But if, instead of rotating around PP, it rotates around some other axis, RR, making a small angle, POR, with the axis of figure PP; then it has been known since the time of Euler that the axis of rotation RR, if referred to the spheroid regarded as fixed, will gradually rotate round the axis of figure PP in a period defined in the following way:—If we put C = the moment of momentum of the spheroid around the axis of figure, and A = the corresponding moment around an axis passing through the equator EQ, then, calling one day the period of rotation of the spheroid, the axis RR will make a revolution around PP in a number of days represented by the fraction C/(C − A). In the case of the earth, this ratio is 1/0.0032813 or 305. It follows that the period in question is 305 days.

Up to 1890 the most careful observations and researches failed to establish the periodicity of such a rotation, though there was strong evidence of a variation of latitude. Then S. C. Chandler, from an elaborate discussion of a great number of observations, showed that there was really a variation of the latitude of the points of observation; but, instead of the period being 305 days, it was about 428 days. At first sight this period seemed to be

inconsistent with dynamical theory. But a defect was soon found in the latter, the correction of which reconciled the divergence. In deriving a period of 305 days the earth is regarded as an absolutely rigid body, and no account is taken either of its elasticity or of the mobility of the ocean. A study of the figure will show that the centrifugal force round the axis RR will act on the equatorial protuberance of the rotating earth so as to make it tend in the direction of the arrows. A slight deformation of the earth will thus result; and the axis of figure of the distorted spheroid will no longer be PP, but a line P′P′ between PP and RR. As the latter moves round, P′P′ will continually follow it through the incessant change of figure produced by the change in the direction of the centrifugal force. Now the rate of motion of RR is determined by the actual figure at the moment. It is therefore less than the motion in an absolutely rigid spheroid in the proportion RP′ : RP. It is found that, even though the earth were no more elastic than steel, its yielding combined with the mobility of the ocean would make this ratio about 2 : 3, resulting in an increase of the period by one-half, making it about 457 days. Thus this small flexibility is even greater than that necessary to the reconciliation of observation with theory, and the earth is shown to be more rigid than steel —a conclusion long since announced by Kelvin for other reasons.



Chandler afterwards made an important addition to the subject by showing that the motion was represented by the superposition of two harmonic terms, the first having a period of about 430 days, the other of one year. The result of this superposition is a seven-year period, which makes 6 periods of the 428-day term ($428^{d} \times 6 = 2568^{d}$ = 7 years, nearly), and 7 periods of the annual term. Near one phase of this combined period the two component motions nearly annul each other, so that the variation is then small, while at the opposite phase, 3 to 4 years later, the two motions are in the same direction and the range of variation is at its maximum. The coefficient of the 428-day term seems to be between 0.12″ and 0.16″; that of the annual term between 0.06″ and 0.11″. Recent observations give smaller values of both than those made between 1890 and 1900, and there is no reason to suppose either to be constant.

The present state of the theory may be summed up as follows:—

1. The fourteen-month term is an immediate result of the fact that the axes of rotation and figure of the earth do not strictly coincide, but make with each other a small angle of which the mean value is about 0.15″. If the earth remained invariable, without any motion of matter on its surface, the result of this non-coincidence would be the revolution of the one pole round the other in a circle of radius 0.15″, or about 15 ft., in a period of about 429 days. This revolution is called the *Eulerian motion*, after the mathematician who discovered it. But owing to meteorological causes the motion in question is subject to annual changes. These changes arise from two causes—the one statical, the other dynamical.

2. The statical causes are deposits of snow or ice slowly changing the position of the pole of figure of the earth. For example, a deposit of snow in Siberia would bring the equator of figure of the earth a little nearer to Siberia and throw the pole a little way from it, while a deposit on the American continent would have the opposite effect. Owing to the approximate symmetry of the American and Asiatic continents it does not seem likely that the inequality of snowfall would produce an appreciable effect.

3. The dynamical causes are atmospheric and oceanic currents. Were these currents invariable their only effect would be that the Eulerian motion would not take place exactly round the mean pole of figure, but round a point slightly separated from it. But, as a matter of fact, they are subject to an annual variation. Hence the motion of the pole of rotation is also subject to a similar variation. The annual term in the latitude is thus accounted for.

Besides Chandler, Albrecht of Berlin has investigated the motion of the pole P. The methods of the two astronomers are in some points different. Chandler has constructed empirical formulae representing the motion, with the results already given, while Albrecht has determined the motion of the pole from observation simply, without trying to represent it either by a formula or by theory. It is noteworthy that the difference between Albrecht’s numerical results and Chandler’s formulae is generally less than 0.05″.

When the fluctuation in the position of the pole was fully confirmed, its importance in astronomy and geodesy led the International Geodetic Association to establish a series of stations round the globe, as nearly as possible on the same parallel of latitude, for the purpose of observing the fluctuation with a greater degree of precision than could be attained by the miscellaneous observations before available. The same stars were to be observed from month to month at each station with zenith-telescopes of similar approved construction. This secures a double observation of each component of the polar motion, from

which most of the systematic errors are eliminated. The principal stations are: Carloforte, Italy; Mizusawa, Japan; Gaithersburg, Maryland; and Ukiah, California, all nearly on the same parallel of latitude, 39° 8′.

The fluctuations derived from this international work during the last seven years deviate but slightly from Chandler's formulae though they show a markedly smaller value of the annual term. In consequence, the change in the amplitude of the fluctuation through the seven-year period is not so well marked as before 1900.

Chandler's investigations are found in a series of papers published in the *Astronomical Journal*, vols. xi. to xv. and xviii. Newcomb's explanation of the lengthening of the Eulerian period is found in the *Monthly Notices of the Royal Astronomical Society* for March 1892. Later volumes of the *Astronomical Journal* contain discussions of the causes which may produce the annual fluctuation. An elaborate mathematical discussion of the theory is by Vito Volterra: "Sulla teoria dei movimenti del Polo terrestre" in the *Astronomische Nachrichten*, vol. 138; also, more fully in his memoir "Sur la théorie des variations des latitudes," *Acta Mathematica*, vol. xxii. The results of the international observations are discussed from time to time by Albrecht in the publications of the International Geodetic Association, and in the *Astronomische Nachrichten* (see also EARTH, FIGURE OF).

(S. N.)

# LATIUM,[1] in ancient geography, the name given to the portion of central Italy which was bounded on the N.W. by Etruria, on the S.W. by the Tyrrhenian Sea, on the S.E. by Campania, on the E. by Samnium and on the N.E. by the mountainous district inhabited by the Sabini, Aequi and Marsi. The name was, however, applied very differently at different times. Latium originally means the land of the Latini, and in this sense, which alone is in use historically, it was a tract of limited extent; but after the overthrow of the Latin confederacy, when the neighbouring tribes of the Rutuli, Hernici, Volsci and Aurunci, as well as the Latini properly so called, were reduced to the condition of subjects and citizens of Rome, the name of Latium was extended to comprise them all. It thus denoted the whole country from the Tiber to the mouth of the Savo, and just included the Mons Massicus, though the boundary was not very precisely fixed (see below). The change thus introduced, though already manifest in the composition of the Latin league (see below) was not formally established till the reign of Augustus, who formed of this larger Latium and Campania taken together the first region of Italy; but it is already recognized by Strabo (v. 3. 2. p. 228), as well as by Pliny, who terms the additional territory thus incorporated *Latium Adjectum*, while he designates the original Latium, extending from the Tiber to Circeii, as *Latium Antiquum*.

1. LATIUM ANTIQUUM consisted principally of an extensive plain, now known as the Campagna di Roma, bounded towards the interior by the Apennines, which rise very abruptly from the plains to a height of between 4000 and 5000 ft. Several of the Latin cities, including Tibur and Praeneste, were situated on the terrace-like underfalls of these mountains,[2] while Cora, Norba and Setia were placed in like manner on the slopes of the Volscian mountains (Monti Lepini), a rugged and lofty limestone range, which runs parallel to the main mass of the Apennines, being separated from them, however, by the valley of the Trerus (Sacco), and forms a continuous barrier from there to Terracina. No volcanic eruptions are known to have taken place in these mountains within the historic period, though Livy sometimes speaks of it "raining stones in the Alban hills" (i. 31, xxxv. 9—on the latter occasion it even did so on the Aventine). It is asserted, too, that some of the earliest tombs of the necropolis of Alba Longa (*q.v.*) were found beneath a stratum of peperino. Earthquakes (not of a violent character within recent centuries, though the ruin of the Colosseum is probably to be ascribed to this cause) are not unknown even at the present day in Rome and in the Alban Hills, and a seismograph has been established at Rocca di Papa. The surface is by no means a uniform plain, but is a broad undulating tract, furrowed throughout by numerous depressions, with precipitous banks, serving as water-courses, though rarely traversed by any considerable stream. As the general level of the plain rises gradually, though almost imperceptibly, to the foot of the Apennines, these channels by degrees assume the character of ravines of a formidable description.

Four main periods may be distinguished in the geological history of Rome and the surrounding district. The hills on the right bank of the Tiber culminating in Monte Mario

**Geology.** (455 ft.) belong to the first of these, being of the Pliocene formation; they consist of a lower bluish-grey clay and an upper group of yellow sands and gravels. This clay since Roman times has supplied the material for brick-making, and the valleys which now separate the different summits (Janiculum, Vatican, Monte Mario) are in considerable measure artificial. On the left bank this clay has been reached at a lower level, at the foot of the Pincian Hill, while in the Campagna it has been found to extend below the later volcanic formations. The latter may be divided into two groups, corresponding to the second and third periods. In the second period volcanic activity occurred at the bottom of the Pliocene sea, and the tufa, which extends over the whole Campagna to a thickness of 300 ft. or more, was formed. At the same time, hot springs, containing abundant carbonate of lime in solution, produced deposits of travertine at various points. In the third, after the Campagna, by a great general uplift, had become a land surface, volcanic energy found an outlet in comparatively few large craters, which emitted streams of hard lava as well as fragmentary materials, the latter forming sperone (*lapis Gabinus*) and peperino (*lapis Albanus*), while upon one of the former, which runs from the Alban Hills to within 2 m. of Rome, the Via Appia was carried. The two main areas near Rome are formed by the group of craters on the north (Bracciano, Bolsena, &c.) and the Alban Hills on the south, the latter consisting of one great crater with a base about 12 m. in diameter, in the centre of which a smaller crater was later on built up (the basin is now known as the Campo di Annibale) with several lateral vents (the Lake of Albano, the Lake of Nemi, &c.). The Alban Mount (Monte Cavo) is almost the highest point on the rim of the inner crater, while Mount Algidus and Tusculum are on the outer ring wall of the larger (earlier) crater.

The fourth period is that in which the various subaërial agencies of abrasion, and especially the streams which drain the mountain chain of the Apennines, have produced the present features of the Campagna, a plain furrowed by gullies and ravines. The communities which inhabited the detached hills and projecting ridges which later on formed the city of Rome were in a specially favourable position. These hills (especially the Palatine, the site of the original settlement) with their naturally steep sides, partly surrounded at the base by marshes and situated not far from the confluence of the Anio with the Tiber, possessed natural advantages not shared by the other primitive settlements of the district; and their proximity to one another rendered it easy to bring them into a larger whole. The volcanic materials available in Rome and its neighbourhood were especially useful in building. The tufa, sperone and peperino were easy to quarry, and could be employed by those who possessed comparatively elementary tools, while travertine, which came into use later, was an excellent building stone, and the lava (*selce*) served for paving stones and as material for concrete. The strength of the renowned Roman concrete is largely due to the use of pozzolana (see PUTEOLI), which also is found in plenty in the Campagna.

Between the volcanic tract of the Campagna and the sea there is a broad strip of sandy plain, evidently formed merely by the accumulation of sand from the sea, and constituting a barren tract, still covered almost entirely with wood as it was in ancient times, except for the almost uninterrupted line of villas along the ancient coast-line, which is now marked by a line of sand-hills, some ½ m. or more inland (see LAVINIUM, TIBER). This long belt of sandy shore extends without a break for a distance of above 30 m. from the mouth of the Tiber to the promontory of Antium (Porto d'Anzio); a low rocky headland, projecting out into the sea, and forming the only considerable angle in this line of coast. Thence again a low sandy shore of similar character, but with extensive shore lagoons which served in Roman times and serve still for fish-breeding, extends for about 24 m. to the foot of the Monte Circeo (*Circeius Mons*, *q.v.*). The region of the Pomptine Marshes (*q.v.*) occupies almost the whole tract between the sandy belt on the seashore and the Volscian mountains, extending from the southern foot of the Alban Hills below Velletri to the sea near Terracina.

The district sloping down from Velletri to the dead level of the Pontine (Pomptine) Marshes has not, like the western and northern slopes of the Alban Hills, drainage towards the Tiber.

**Drainage.** The subsoil too is differently formed: the surface consists of very absorbent materials, then comes a stratum of less permeable tufa or peperino (sometimes clay is present), and below that again more permeable materials. In ancient, and probably pre-Roman, times this district was drained by an elaborate system of *cuniculi*, small drainage tunnels, about 5 ft. high and 2 ft. wide, which ran, not at the bottom of the valleys, where there were sometimes streams already, and where, in any case, erosion would have broken through their roofs, but along their slopes, through the less permeable tufa, their object being to drain the hills on each side of the valleys. They had probably much to do with the relative healthiness of this district in early times. Some of them have been observed to be earlier in date than the Via Appia (312 B.C.). They were studied in detail by R. de la Blanchère. When they fell into desuetude, malaria gained the upper hand, the lack of drainage providing breeding-places for the malarial mosquito. Remains of similar drainage channels exist in many parts of the Campagna

Romana and of southern Etruria at points where the natural drainage was not sufficient, and especially in cultivated or inhabited hills (though it was not necessary here, as in the neighbourhood of Velletri, to create a drainage system, as streams and rivers were already present as natural collectors) and streams very frequently pass through them at the present day. The drainage channels which were dug for the various crater lakes in the neighbourhood of Rome are also interesting in this regard. That of the Alban Lake is the most famous; but all the other crater lakes are similarly provided. As the drainage by *cuniculi* removed the moisture in the subsoil, so the drainage of the lakes by *emissaria*, outlet channels at a low level, prevented the permeable strata below the tufa from becoming impregnated with moisture which they would otherwise have derived from the lakes of the Alban Hills. The slopes below Velletri, on the other hand, derive much of their moisture from the space between the inner and outer ring of the Alban volcano, which it was impossible to drain: and this in turn receives much moisture from the basin of the extinct inner crater.[3]

***Pre-historic remains.***

Numerous isolated palaeolithic objects of the Mousterian type have been found in the neighbourhood of Rome in the quaternary gravels of the Tiber and Anio; but no certain traces of the neolithic period have come to light, as the many flint implements found sporadically round Rome probably belong to the period which succeeded neolithic (called by Italian archaeologists the eneolithic period) inasmuch as both stone and metal (not, however, bronze, but copper) were in use.[4] At Sgurgola, in the valley of the Sacco, a skeleton was found in a rock-cut tomb of this period which still bears traces of painting with cinnabar. A similar rock-cut tomb was found at Mandela, in the Anio valley. Both are outside the limits of the Campagna in the narrower sense; but similar tombs were found (though less accurately observed) in travertine quarries between Rome and Tivoli. Objects of the Bronze age too have only been found sporadically. The earliest cemeteries and hut foundations of the Alban Hills belong to the Iron age, and cemeteries and objects of a similar character have been found in Rome itself and in southern Etruria, especially the characteristic hut-urns. The objects found in these cemeteries show close affinity with those found in the terremare of Emilia, these last being of earlier date, and hence Pigorini and Helbig consider that the Latini were close descendants of the inhabitants of the terremare. On the other hand, the ossuaries of the Villanova type, while they occur as far south as Veii and Caere, have never so far been found on the left bank of the Tiber, in Latium proper (see L. Pigorini in *Rendiconti dei Lincei*, ser. v. vol. xvi., 1907, p. 676, and xviii., 1909). We thus have at the beginning of the Iron age two distinct currents of civilization in central Italy, the Latin and that of Villanova. As to the dates to which these are to be attributed, there is not as yet complete accord, *e.g.* some archaeologists assign to the 11th, others (and with far better reasons) to the 8th century B.C., the earliest tombs of the Alban necropolis and the coeval tombs of the necropolis recently discovered in the Forum at Rome. In this last necropolis cremation seems slightly to precede inhumation in date.

For the prehistoric period see *Bullettino di paleontologia Italiana, passim*, B. Modestov, *Introduction à l'histoire romaine* (Paris, 1907), and T. E. Peet, *The Stone and Bronze Ages in Italy* (Oxford, 1909).

***Latin League.***

It is uncertain to what extent reliance can be placed upon the traditional accounts of the gradual spread of the supremacy of Rome in Latium, and the question cannot be discussed here.[5] The list of the thirty communities belonging to the Latin league, given by Dionysius of Halicarnassus (v. 61), is, however, of great importance. It is considered by Th. Mommsen (*Roman History*, i. 448) that it dates from about the year 370 B.C., to which period belong the closing of the confederacy, no fresh communities being afterwards admitted to it, and the consequent fixing of the boundaries of Latium. The list is as follows: Ardeates, Aricini, Bovillani,[6] Bubentani, Cabani, Carventani, Circeiates, Coriolani, Corbintes, Corni (probably Corani), Fortinei (?), Gabini, Laurentini, Lavinates, Labicani, Lanuvini, Nomentani, Norbani, Praenestini, Pedani, Querquetulani, Satricani, Scaptini, Setini, Tellenii, Tiburtini, Tolerini, Tusculani, Veliterni.



These communities may be briefly described according to their geographical arrangement. Laurentum and Lavinium, names so conspicuous in the legendary history of Aeneas, were situated in the sandy strip near the sea-coast—the former only 8 m. S.E. of Ostia, which was from the first merely the port of Rome, and never figured as an independent city. Farther S.E. again lay Ardea, the ancient capital of the Rutuli, and some distance beyond that Antium, situated on the sea-coast, which does not occur in the list of Dionysius, and is, in the early annals of Rome, called a Volscian town—even their chief city. On the southern underfalls of the Alban mountains, commanding the plain at the foot, stood Lanuvium and Velitrae; Aricia rose on a neighbouring hill, and Corioli was probably situated on the lower slopes. The village of the Cabani (probably identical with the Cabenses) is possibly to be sought on the site of the modern Rocca di Papa, N. of Monte Cavo. The more important city

of Tusculum occupied one of the northern summits of the same group; while opposite to it, in a commanding situation on a lofty offshoot of the Apennines, rose Praeneste, now Palestrina. Bola and Pedum were probably in the same neighbourhood, Labici on an outlying summit (Monte Compatri) of the Alban Hills below Tusculum, and Corbio (probably at Rocca Priora) on a rocky summit east of the same city. Tibur (Tivoli) occupied a height commanding the outlet of the river Anio. Corniculum, farther west, stood on the summit of one of three conical hills that rise abruptly out of the plain at the distance of a few miles from Monte Gennaro, the nearest of the Apennines, and which were thence known as the Montes Corniculani. Nomentum was a few miles farther north, between the Apennines and the Tiber, and close to the Sabine frontier. The boundary between the two nations was indeed in this part very fluctuating. Nearly in the centre of the plain of the Campagna stood Gabii; Bovillae was also in the plain, but close to the Appian Way, where it begins to ascend the Alban Hills. Several other cities—Tellenae, Scaptia and Querquetulum—mentioned in the list of Dionysius were probably situated in the Campagna, but the site cannot be determined. Satricum, on the other hand, was certainly south of the Alban Hills, between Velitrae and Antium; while Cora, Norba and Setia (all of which retain their ancient names with little modification) crowned the rocky heights which form advanced posts from the Volscian mountains towards the Pontine Marshes. Carventum possibly occupied the site of Rocca Massima N. of Cori, and Tolerium was very likely at Valmontone in the valley of the Sacco (anc. Trerus or Tolerus). The cities of the Bubentani and Fortinei are quite unknown.

A considerable number of the Latin cities had before 370 B.C. either been utterly destroyed or reduced to subjection by Rome, and had thus lost their independent existence. Such were Antemnae and Caenina, both of them situated within a few miles of Rome to the N., the conquest of which was ascribed to Romulus; Fidenae, about 5 m. N. of the city, and close to the Tiber; and Crustumerium, in the hilly tract farther north towards the Sabine frontier. Suessa Pometia also, on the borders of the Pontine Marshes, to which it was said to have given name, was a city of importance, the destruction of which was ascribed to Tarquinius Superbus. In any case it had disappeared before 370 B.C., as it does not occur in the list of the Latin league attributable to that date. It is probably to be sought between Velletri and Cisterna. But by far the most important of these extinct cities was Alba, on the lake to which it gave its name, which was, according to universally received tradition, the parent of Rome, as well as of numerous other cities within the limits of Latium, including Gabii, Fidenae, Collatia, Nomentum and other well-known towns. Whether or not this tradition deserves to rank as historical, it appears certain that at a still earlier period there existed a confederacy of thirty towns, of which Alba was the supreme head. A list of those who were wont to participate in the sacrifices on the Alban Mount is given us by Pliny (*N.H.* iii. 5. 69) under the name of *populi albenses*, which includes only six or at most eight of those found in the list of Dionysius;[7] and these for the most part among the more obscure and least known of the names given by him. Many of the rest are unknown; while the more powerful cities of Aricia, Lanuvium and Tusculum, though situated immediately on the Alban Hills, are not included, and appear to have maintained a wholly independent position. This earlier league was doubtless broken up by the fall of Alba; it was probably the increasing power of the Volsci and Aequi that led to the formation of the later league, including all the more powerful cities of Latium, as well as to the alliance concluded by them with the Romans in the consulship of Spurius Cassius (493 B.C.). Other cities of the Latin league had already (according to the traditional dates) received Latin colonies—Velitrae (494 B.C.), Norba (492), Ardea (442), Labici (418), Circei (393), Satricum (385), Setia (382).

The cities of the Latin league continued to hold general meetings or assemblies from time to time at the grove of the Aqua Ferentina, a sanctuary at the foot of the Alban Hills, perhaps in a valley below Marino, while they had also a common place of worship on the summit of the Alban Mount (Monte Cavo), where stood the celebrated temple of Jupiter Latiaris. The participation in the annual sacrifices at this sanctuary was regarded as typical of a Latin city (hence the name “prisci Latini” given to the participating peoples); and they continued to be celebrated long after the Latins had lost their independence and been incorporated in the Roman state.[8]

***Roman supremacy.***

We are on firmer ground in dealing with the spread of the supremacy of Rome in Latium when we take account of the foundation of new colonies and of the formation of new tribes, processes which as a rule go together. The information that we have as to the districts in which the sixteen earliest clans (*tribus rusticae*)[9] were settled shows us that, except along the Tiber, Rome’s dominion extended hardly more than 5 m. beyond the city gates (Mommsen, *History of Rome*, i. 58). Thus, towards the N. and E. we find the towns of Antemnae, Fidenae, Caenina and Gabii;[10] on the S.E., towards Alba, the boundary of Roman territory was at the Fossae

Cluiliae, 5 m. from Rome, where Coriolanus encamped (Livy ii. 39), and, on the S., towards Laurentum at the 6th mile, where sacrifice to Terminus was made (Ovid, *Fasti*, ii. 681): the Ambarvalia too were celebrated even in Strabo's day (v. 3. 3. p. 230) at a place called Φῆστοι between the 5th and 6th mile. The identification (cf. Hülsen in Pauly-Wissowa, *Realencyclopädie*, vi. 2223) of this locality with the grove of the Arval brothers at the 5th mile of the Via Portuensis, to the W. of Rome, and of the Ambarvalia with the festival celebrated by this brotherhood in May of each year, is now generally accepted. But Roman sway must either from the first, or very soon, have extended to Ostia, the port of Rome at the mouth of the Tiber: and it was as the emporium of Latium that Rome acquired her first importance.[11]



The boundary of the *Ager Romanus antiquus* towards the north-west is similarly fixed by the festival of the Robigalia at the 5th milestone of the Via Clodia. Within this area fall the districts inhabited by the earliest tribes, so far as these are known to us. The *tribus Romilia* was settled on the right bank of the Tiber near the sanctuary of the Arvales, the *Galeria* perhaps a little farther west on the lower course of the stream now known as Galera, and the *Fabia* perhaps on the Cremera towards Veii. We know that the *pagus Lemonius* was on the Via Latina, and that the *tribus Pupinia* dwelt between Tusculum and the city, while the territory of the *Papiria* possibly lay nearer Tusculum, as it was to this tribe that the Roman citizens in Tusculum belonged in later days. It is possible that the *Camilia* was situated in the direction of Tibur, inasmuch as this town was afterwards enrolled in this tribe. The *tribus Claudia*, probably the last of the 16 older *tribus rusticae*, was according to tradition founded in 504 B.C. Its territory lay beyond the Anio, between Fidenae and Ficulea (Liv. ii. 16; Dion. Hal. v. 40). The locality of the *pagi* round which the other tribes were grouped is not known to us.

***The primitive tribes.***

With the earliest extensions of the Roman territory coincided the first beginnings of the Roman road system. The road to Ostia may have existed from the first: but after the Latin communities on the lower Anio had fallen under the dominion of Rome, we may well believe that the first portion of the Via Salaria, leading to Antemnae, Fidenae (the fall of which is placed by tradition in 428 B.C.) and Crustumerium, came into existence. The formation (according to the traditional dating in 495 or 471 B.C.) of the *tribus Clustumina* (the only one of the earlier twenty-one tribes which bears a local name) is both a consequence of an extension of territory and of the establishment of the assembly of the plebs by tribes, for which an inequality of the total number of divisions was desirable (Mommsen, *History of Rome*, i. 360). The correlative of the Via Salaria was the Via Campana, so called because it led past the grove of the Arvales along the right bank of the Tiber to the Campus Salinarum Romanarum,[12] the salt marshes, from which the Via Salaria took its name, inasmuch as it was the route by which Sabine traders came from the interior to fetch the salt. To this period would also belong the Via Ficulensis, leading to Ficulea, and afterwards prolonged to Nomentum, and the Via Collatina, which led to Collatia. Gabii became Roman in fairly early times, though at what period is uncertain, and with its subjugation must have originated the Via Gabina, afterwards prolonged to Praeneste. The Via Latina too must be of very early origin; and tradition places the foundation of the Latin colony at Signia (to which it led) as early as 495 B.C. Not long after the capture of Fidenae, the main outpost of Veii, the chief city itself fell (396 B.C.) and a road (still traceable) was probably made thither. There was also probably a road to Caere in early times, inasmuch as we hear of the flight of the Vestals thither in 389 B.C. The origin of the rest of the roads is no doubt to be connected with the gradual establishment of the Latin league. We find that while the later (long distance) roads bear as a rule the name of their constructor, all the short distance roads on the left bank of the Tiber bear the names of towns which belonged to the league—Nomentum, Tibur, Praeneste, Labici, Ardea, Laurentum—while Ficulea and Collatia do not appear. The Via Pedana, leading to Pedum, is known to us only from an inscription (*Bull. Soc. Antiquaires de France*, 1905, p. 177) discovered in Tunisia in 1905, and may be of much later origin; it was a branch of the Via Praenestina.

***Road system.***

There must too have been a road, along the line of the later Via Appia, to Bovillae, Aricia, Lanuvium and Velitrae, going thence to Cora, Norba and Setia along the foot of the Volscian Mountains; while nameless roads, which can still be traced, led direct from Rome to Satricum and to Lavinium.

We can trace the advance of the Roman supremacy with greater ease after 387 B.C., inasmuch as from this year (adopting the traditional dating for what it is worth) until 299 B.C. every accession of territory is marked by the foundation of a group of new tribes; the limit of 35 in all was reached in the latter year. In 387, after the departure of the Gauls, southern Etruria was conquered, and four new tribes were formed: *Arnensis* (probably derived from Aro, mod. Arrone—though the ancient name does not occur in literature—the

stream which forms the outlet to the lake of Bracciano, anc. *Lacus Sabatinus*),[13] *Sabatina* (called after this lake), *Stellatina* (named from the Campus Stellatinus, near Capena; cf. Festus p. 343 Müll.) and *Tromentina* (which, Festus tells us, was so called from the Campus Tromentus, the situation of which we do not know). Four years later were founded the Latin colonies of Sutrium and Nepet. In 358 B.C. Roman preponderance in the Pomptine territory was shown by the formation of the *tribus Pomptina* and *Publilia*, while in 338 and 329 respectively Antium and Tarracina became colonies of Roman citizens, the former having been founded as a Latin colony in 494 B.C.

After the dissolution of the Latin league which followed upon the defeat of the united forces of the Samnites and of those Latin and Volscian cities which had revolted against Rome, two new tribes, *Maecia and Scaptia*,[14] were created in 332 B.C. in connexion with the distribution of the newly acquired lands (Mommsen, *History*, i. 462). A further advance in the same direction ending in the capture of Privernum in 329 B.C. is marked by the establishment in 318 B.C. of the *tribus Oufentina* (from the river Ufens which runs below Setia, mod. *Sezze*, and Privernum, mod. *Piperno*, and the *tribus Falerna* (in the Ager Falernus), while the foundation of the colonies of Cales (334) and Fregellae (328) secured the newly won south Volscian and Campanian territories and led no doubt to a prolongation of the Via Latina. The moment had now come for the pushing forward of another line of communication, which had no doubt reached Tarracina in 329 B.C. but was now definitely constructed (*munita*) as a permanent military highway as far as Capua in 312 B.C. by Appius Claudius, after whom it was named. To him no doubt is due the direct line of road through the Pontine Marshes from Velitrae to Terracina. Its construction may fairly be taken to mark the period at which the roads of which we have spoken, hitherto probably mere tracks, began to be transformed into real highways. In the same year (312) the colony of Interamna Lirenas was founded, while Luceria, Suessa (Aurunca) and Saticula had been established a year or two previously. Sora followed nine years later. In 299 B.C. further successes led to the establishment of two new tribes—the *Teretina* in the upper valley of the Trerus (Sacco) and the *Aniensis*, in the upper valley of the Anio—while to about the same time we must attribute the construction of two new military roads, both secured by fortresses. The southern road, the Via Valeria led to Carsioli and Alba Fucens (founded as Latin colonies respectively in 298 and 303 B.C.), and the northern (afterwards the Via Flaminia[15]) to Narnia (founded as a Latin colony in 299 B.C.). There is little doubt that the formation of the *tribus Quirina* (deriving its name possibly from the town of Cures) and the *tribus Velina* (from the river Velinus, which forms the well-known waterfalls near Terni) is to be connected with the construction of the latter high road, though its date is not certainly known. The further history of Roman supremacy in Italy will be found in the article ROME: *History*. We notice, however, that the continual warfare in which the Roman state was engaged led to the decadence of the free population of Latium, and that the extension of the empire of Rome was fatal to the prosperity of the territory which immediately surrounded the city.[16]

***Causes of depopulation.***

What had previously, it seems, been a well-peopled region, with peasant proprietors, kept healthy by careful drainage, became in the 4th and 3rd centuries B.C. a district consisting in large measure of huge estates (*latifundia*) owned by the Roman aristocracy, cultivated by gangs of slaves. This led to the disappearance of the agricultural population, to a decline in public safety, and to the spread of malaria in many parts; indeed, it is quite possible that it was not introduced into Latium before the 4th century B.C. The evil increased in the later period of the Republic, and many of the old towns of Latium sank into a very decayed condition; with this the continual competition of the provinces as sources of food-supply no doubt had a good deal to do. Cicero speaks of Gabii, Labici and Bovillae as places that had fallen into abject poverty, while Horace refers to Gabii and Fidenae as mere “deserted villages,” and Strabo as “once fortified towns, but now villages, belonging to private individuals.” Many of the smaller places mentioned in the list of Dionysius, or the early wars of the Romans, had altogether ceased to exist, but the statement of Pliny that fifty-three communities (*populi*) had thus perished within the boundaries of Old Latium is perhaps exaggerated. By the end of the Republic a good many parts of Latium were infected, and Rome itself was highly malarious in the warm months (see W. H. S. Jones in *Annals of Archaeology and Anthropology*, ii. 97, Liverpool, 1909). The emperors Claudius, Nerva and Trajan turned their attention to the district, and under their example and exhortation the Roman aristocracy erected numerous villas within its boundaries, and used them at least for summer residences. During the 2nd century the Campagna seems to have entered on a new era of prosperity. The system of roads radiating in all directions from Rome (see ITALY: *History*, § B) belonged to a much earlier period; but they were connected by a network of crossroads (now mostly abandoned, while the main lines are still almost all in use) leading to the very numerous villas with

which the Campagna was strewn (even in districts which till recently were devastated by malaria), and which seem in large measure to belong to this period. Some of these are of enormous extent, *e.g.* the villa of the Quintilii on the Via Appia, that known as Setta Bassi on the Via Latina, and that of Hadrian near Tibur, the largest of all.

When the land tax was introduced into Italy in 292, the first region of Augustus obtained the name of *provincia Campania*. Later on the name Latium entirely disappeared, and the name Campania extended as far as Veii and the Via Aurelia, whence the medieval and modern name Campagna di Roma. The donation made by Constantine to various churches of Rome of numerous estates belonging to the *patrimonium Caesaris* in the neighbourhood of Rome was of great historical importance, as being the origin of the territorial dominion of the papacy. His example was followed by others, so that the church property in the Campagna soon became considerable; and, owing to the immunities and privileges which it enjoyed, a certain revival of prosperity ensued. The invasions of the barbarian hordes did great harm, but the formation of centres (*domuscultae*) in the 8th and 9th centuries was a fact of great importance: the inhabitants, indeed, formed the medieval militia of the papacy. Smaller centres (the *colonia*—often formed in the remains of an ancient villa—the *curtis* or *curia*, the *castrum*, the *casale*) grew up later. We may note that, owing to the growth of the temporal power of the popes, there was never a *dux Romae* dependent on the exarchate of Ravenna, similar to those established by Narses in the other districts of Italy.

The papal influence was also retained by means of the suburban bishoprics, which took their rise as early as the 4th and 5th centuries. The rise of the democratic commune of Rome[17] about 1143 and of the various trade corporations which we already find in the early 11th century led to struggles with the papacy; the commune of Rome made various attempts to exercise supremacy in the Campagna and levied various taxes from the 12th century until the 15th. The commune also tried to restrict the power of the barons, who, in the 13th century especially, though we find them feudatories of the holy see from the 10th century onwards, threatened to become masters of the whole territory, which is still dotted over with the baronial castles and lofty solitary towers of the rival families of Rome—Orsini, Colonna, Savelli, Conti, Caetani—who ruthlessly destroyed the remains of earlier edifices to obtain materials for their own, and whose castles, often placed upon the high roads, thus following a strategic line to a stronghold in the country, did not contribute to the undisturbed security of traffic upon them, but rather led to their abandonment. On a list of the inhabited centres of the Campagna of the 14th century with the amount of salt (which was a monopoly of the commune of Rome) consumed by each, Tomassetti bases an estimate of the population: this was about equal to that of our own times, but differently distributed, some of the smaller centres having disappeared at the expense of the towns. Several of the popes, as Sixtus IV. and Julius III., made unsuccessful attempts to improve the condition of the Campagna, the former making a serious attempt to revive agriculture as against pasture, while in the latter part of the 16th century a line of watch-towers was erected along the coast. In the Renaissance, it is true, falls the erection of many fine villas in the neighbourhood of Rome—not only in the hills round the Campagna, but even in certain places in the lower ground, *e.g.* those of Julius II. at La Magliana and of Cardinal Trivulzio at Salone,—and these continued to be frequented until the end of the 18th century, when the French Revolution dealt a fatal blow to the prosperity of the Roman nobility. The 17th and 18th centuries, however, mark the worst period of depopulation in the more malarious parts of the Campagna, which seems to have begun in the 15th century, though we hear of malaria throughout the middle ages. The most healthy portions of the territory are in the north and east, embracing the slopes of the Apennines which are watered by the Teverone and Sacco; and the most pestilential is the stretch between the Monti Lepini and the sea. The Pontine Marshes (*q.v.*) included in the latter division, were drained, according to the plan of Bolognini, by Pius VI., who restored the ancient Via Appia to traffic; but though they have returned to pasture and cultivation, their insalubrity is still notorious. The soil in many parts is very fertile and springs are plentiful and abundant: the water is in some cases sulphureous or ferruginous. In summer, indeed, the vast expanse is little better than an arid steppe; but in the winter it furnishes abundant pasture to flocks of sheep from the Apennines and herds of silver-grey oxen and shaggy black horses, and sheep passing in the summer to the mountain pastures. A certain amount of horse-breeding is done, and the government has, as elsewhere in Italy, a certain number of stallions. Efforts have been made since 1882 to cure the waterlogged condition of the marshy grounds. The methods employed have been three—(i.) the cutting of drainage channels and clearing the marshes by pumping, the method principally employed; (ii.) the system of warping, *i.e.* directing a river so that it may deposit its sedimentary matter

***Under the commune.***

***Modern conditions]***

in the lower-lying parts, thus levelling them up and consolidating them, and then leading the water away again by drainage; (iii.) the planting of firs and eucalyptus trees, *e.g.* at Tre Fontane and elsewhere. These efforts have not been without success, though it cannot be affirmed that the malarial Campagna is anything like healthy yet. The regulation of the rivers, more especially of the Tiber, is probably the most efficient method for coping with the problem. Since 1884 the Italian Government have been systematically enclosing, pumping dry and generally draining the marshes of the Agro Romano, that is, the tracts around Ostia; the Isola Sacra, at the mouth of the Tiber; and Maccarese. Of the whole of the Campagna less than one-tenth comes annually under the plough. In its picturesque desolation, contrasting so strongly with its prosperity in Roman times, immediately surrounding a city of over half a million inhabitants, and with lofty mountains in view from all parts of it, it is one of the most interesting districts in the world, and has a peculiar and indefinable charm. The modern province of Rome (forming the *compartimento* of Lazio) includes also considerable mountain districts, extending as far N.W. as the Lake of Bolsena, and being divided on the N.E. from Umbria by the Tiber, while on the E. it includes a considerable part of the Sabine mountains and Apennines. The ancient district of the Hernicans, of which Alatri is regarded as the centre, is known as the Ciociaria, from a kind of sandals (*cioce*) worn by the peasants. On the S.E. too a considerable proportion of the group of the Lepini belongs to the province. The land is for the most part let by the proprietors to *mercanti di Campagna*, who employ a subordinate class of factors (*fattori*) to manage their affairs on the spot.



***Malaria.***

The recent discovery that the malaria which has hitherto rendered parts of the Campagna almost uninhabitable during the summer is propagated by the mosquito (*Anopheles claviger*) marks a new epoch; the most diverse theories as to its origin had hitherto been propounded, but it is now possible to combat it on a definite plan, by draining the marshes, protecting the houses by fine mosquito-proof wire netting (for *Anopheles* is not active by day), improving the water supply, &c., while for those who have fever, quinine (now sold cheaply by the state) is a great specific. A great improvement is already apparent; and a law carried in 1903 for the *Bonifica dell' Agro Romano* compels the proprietors within a radius of some 6 m. of Rome to cultivate their lands in a more productive way than has often hitherto been the case, exemption from taxes for ten years and loans at 2-1/2% from the government being granted to those who carry on improvements, and those who refuse being expropriated compulsorily. The government further resolved to open roads and schools and provide twelve additional doctors. Much is done in contending against malaria by the Italian Red Cross Society. In 1900 31% of the inhabitants of the Agro Romano had been fever-stricken; since then the figure has rapidly decreased (5.1% in 1905).

***Produce.***

The wheat crop in 1906 in the Agro Romano was 8,108,500 bushels, the Indian corn 3,314,000 bushels, the wine 12,100,000 gallons and the olive oil 1,980,000 gallons,—these last two from the hill districts. The wine production had declined by one-half from the previous year, exportation having fallen off in the whole country. 1907, however, was a year of great overproduction all over Italy. The wine of the Alban hills is famous in modern as in ancient times, but will not as a rule bear exportation. The forests of the Alban hills and near the coast produce much charcoal and light timber, while the Sabine and Volscian hills have been largely deforested and are now bare limestone rocks. Much of the labour in the winter and spring is furnished by peasants who come down from the Volscian and Hernican mountains, and from Abruzzi, and occupy sometimes caves, but more often the straw or wicker huts which are so characteristic a feature of the Campagna. The fixed population of the Campagna in the narrower sense (as distinct from the hills) is less than 1000. Emigration to America, especially from the Volscian and Hernican towns, is now considerable.

2. Latium Novum Or Adjectum, as it is termed by Pliny, comprised the territories occupied in earlier times by the Volsci and Hernici. It was for the most part a rugged and mountainous country, extending at the back of Latium proper, from the frontier of the Sabines to the sea-coast between Terracina and Sinuessa. But it was not separated from the adjacent territories by any natural frontier or physical boundaries, and it is only by the enumeration of the towns in Pliny according to the division of Italy by Augustus that we can determine its limits. It included the Hernican cities of Anagnia, Ferentinum, Alatrium and Verulae—a group of mountain strongholds on the north side of the valley of the Trerus (Sacco); together with the Volscian cities on the south of the same valley, and in that of the Liris, the whole of which, with the exception of its extreme upper end, was included in the Volscian territory. Here were situated Signia, Frusino, Fabrateria, Fregellae, Sora, Arpinum, Atina, Aquinum, Casinum and Interamna; Anxur (Terracina) was the only seaport that properly belonged to

the Volscians, the coast from thence to the mouth of the Liris being included in the territory of the Aurunci, or Ausones as they were termed by Greek writers, who possessed the maritime towns of Fundi, Formiae, Caieta and Minturnae, together with Suessa in the interior, which had replaced their more ancient capital of Aurunca. Sinuessa, on the sea-coast between the Liris (Garigliano) and the Vulturnus, at the foot of the Monte Massico, was the last town in Latium according to the official use of the term and was sometimes assigned to Campania, while Suessa was more assigned to Latium. On the other hand, as Nissen points out (*Italische Landeskunde*, ii. 554), the Pons Campanus, by which the Via Appia crossed the Savo some 9 m. S.E. of Sinuessa, indicates by its name the position of the old Campanian frontier. In the interior the boundary fell between Casinum and Teanum Sidicinum, at about the 100th milestone of the Via Latina—a fact which led later to the jurisdiction of the Roman courts being extended on every side to the 100th mile from the city, and to this being the limit beyond which banishment from Rome was considered to begin.

Though the Apennines comprised within the boundaries of Latium do not rise to a height approaching that of the loftiest summits of the central range, they attain to a considerable altitude, and form steep and rugged mountain masses from 4000 to 5000 ft. high. They are traversed by three principal valleys: (1) that of the Anio, now called Teverone, which descends from above Subiaco to Tivoli, where it enters the plain of the Campagna; (2) that of the Trerus (Sacco), which has its source below Palestrina (Praeneste), and flows through a comparatively broad valley that separates the main mass of the Apennines from the Volscian mountains or Monti Lepini, till it joins the Liris below Ceprano; (3) that of the Liris (Garigliano), which enters the confines of New Latium about 20 m. from its source, flows past the town of Sora, and has a very tortuous course from thence to the sea at Minturnae; its lower valley is for the most part of considerable width, and forms a fertile tract of considerable extent, bordered on both sides by hills covered with vines, olives and fruit trees, and thickly studded with towns and villages.

It may be observed that, long after the Latins had ceased to exist as a separate people we meet in Roman writers with the phrase of *nomen Latinum*, used not in an ethnical but a purely political sense, to designate the inhabitants of all those cities on which the Romans had conferred "Latin rights" (*jus Latinum*)—an inferior form of the Roman franchise, which had been granted in the first instance to certain cities of the Latins, when they became subjects of Rome, and was afterwards bestowed upon many other cities of Italy, especially the so-called Latin colonies. At a later period the same privileges were extended to places in other countries also—as for instance to most of the cities in Sicily and Spain. All persons enjoying these rights were termed in legal phraseology *Latini* or *Latinae conditionis*.

AUTHORITIES.—For the topography of Latium, and the local history of its more important cities, the reader may consult Sir W. Gell's *Topography of Rome and its Vicinity* (2nd ed., 1 vol., London, 1846); A. Nibby, *Analisi storico-topografico-antiquaria della carta dei dintorni di Roma* (3 vols., 2nd ed., 1848); J. Westphal, *Die römische Kampagne* (Berlin, 1829); A. Bormann, *Alt-lateinische Chorographie und Städte-Geschichte* (Halle, 1852); M. Zoeller, *Latium und Rom* (Leipzig, 1878); R. Burn's *Rome and the Campagna* (London, 1871); H. Dessau, *Corp. Inscr. Lat.* v. xiv. (Berlin, 1887) (Latium); Th. Mommsen, *Corp. Inscr. Lat.* vol. x. pp. 498-675 (Berlin, 1883); G. Tomassetti, "Della Campagna Romana nel medio evo," published in the *Archivio della Società Romana di Storia Patria* (Rome, 1874-1907), and separately (a work dealing with the medieval history and topography of the Campagna in great detail, containing also valuable notices of the classical period); by the same author, *La Campagna romana* (Rome, 1910 foll.); R. A. Lanciani, "I Comentari di Frontino intorno agli acquedotti," *Memorie dei Lincei* (Rome, 1880), serie iii. vol. v. p. 215 sqq. (and separately), also many articles, and *Wanderings in the Roman Campagna* (London, 1909); E. Abbate, *Guida della provincia di Roma* (Rome, 1894, 2 vols.); H. Nissen, *Italische Landeskunde*, ii. (Berlin, 1902), 557 sqq.; T. Ashby, "The Classical Topography of the Roman Campagna," in *Papers of the British School at Rome*, i. iii.-v. (London, 1902 foll.).

(T. As.)

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1 *Latium*, from the same root as *lătus*, side; *later*, brick; πλατύς, flat; Sans. *prath*: not connected with *lātus*, wide.

2 In the time of Augustus the boundary of Latium extended as far E. as Treba (Trevi), 12 m. S.E. of Sublaqueum (Subiaco).

3 See R. de la Blanchère in Daremberg and Saglio, *Dictionnaire des antiquités*, s.vv. *Cuniculus, Emissarium*, and the same author's *Chapitre d'histoire pontine* (Paris, 1889).

4 See G. A. Colini in *Bullettino di paletnologia Italiana*, xxxi. (1905).

5 The most important results will be found stated at the outset of the articles ROME: *History* (the chief being that the Plebeians of Rome probably consisted of Latins and the Patricians of

Sabines), Liguria, Siculi and Aricia. For the Etruscan dominion in the Latin plain see Etruria. Special mention may here be made of one or two points of importance. The legends represent the Latins of the historical period as a fusion of different races, Ligures, Veneti and Siculi among them; the story of the alliance of the Trojan settler Aeneas with the daughter of Latinus, king of the aborigines, and the consequent enmity of the Rutulian prince Turnus, well known to readers of Virgil, is thoroughly typical of the reflection of these distant ethnical phenomena in the surviving traditions. In view of the historical significance of the NO- ethnicon (see Sabini) it is important to observe that the original form of the ethnic adjective no doubt appears in the title of *Juppiter Latiaris* (not *Latinus*); and that Virgil's description of the descent of the noble Drances at Latinus's court (Aen. xi. 340)—*genus huic materna superbum Nobilitas dabat, incertum de patre ferebat*—indicates a very different system of family ties from the famous *patria potestas* and agnation of the Patrician and Sabine clans.

(R. S. C.)

6 The MSS. read βοϊλλανῶν or βοϊλανῶν: the Latin translation has Bolanorum. It is difficult to say which is to be preferred. The list gives only twenty-nine names, and Mommsen proposes to insert Signini.

7 Albani, Aesolani (probably E. of Tibur), Accienses, Abolani, Bubetani, Bolani, Cusuetani (Carventani?), Coriolani, Fidenates, Foreti (Fortinei?), Hortenses (near Corbio), Latinienses (near Rome itself), Longani, Manates, Macrales, Munienses (Castrimoenienses?), Numinienses, Olliculani, Octulani, Pedani, Poletaurini, Querquetulani, Sicani, Sisolenses, Tolerienses, Tutienses (not, one would think, connected with the small stream called Tutia at the 6th mile of the Via Salaria; Liv. xxvi. 11), Vimitellari, Velienses, Venetulani, Vitellenses (not far from Corbio).

8 To an earlier stage of the Latin league, perhaps to about 430 B.C. (Mommsen, *op. cit.* 445 n. 2) belongs the dedication of the grove of Diana by a dictator Latinus, in the name of the people of Tusculum, Aricia, Lanuvium, Laurentum, Cora, Tibur, Suessa Pometia and Ardea.

9 Of the *gentes* from which these tribes took their names, six entirely disappeared in later days, while the other ten can be traced as patrician—a proof that the patricians were not noble families in origin (Mommsen, *Römische Forschungen*, i. 106). For the tribes see W. Kubitschek, *De Romanarum tribuum origine* (Vienna, 1882).

10 We have various traces of the early antagonism to Gabii, *e.g.* the opposition between *ager Romanus* and *ager Gabinus* in the augural law.

11 For the early extension of Roman territory towards the sea, cf. Festus, p. 213, Müll., *s.v.* "Pectuscum:" *Pectuscum Palati dicta est ea regio urbis, quam Romulus obversam posuit, ea parte, in qua plurimum erat agri Romani ad mare versus et qua mollissime adibatur Urbo, cum Etruscorum agrum a Romano Tiberis discluderet, ceterae vicinae civitates colles aliquos haberent oppositos*.

12 The ancient name is known from an inscription discovered in 1888.

13 So Kubitschek in Pauly-Wissowa, *Realencyclopädie*, ii. 1204.

14 Festus tells us (p. 136 Müll.) that the Maecia derived its name "a quodam castro." Scaptia was the only member of the Latin league that gave its name to a tribe.

15 See Flaminia, Via and Valeria, Via.

16 L. Caetani indeed (*Nineteenth Century and After*, 1908) attributes the economic decadence of the Roman Campagna to the existence of free trade throughout the Roman empire.

17 The commune of Rome as such seems to have been in existence in 999 at least.

LATONA (Lat. form of Gr. Λητώ, Leto), daughter of Coeus and Phoebe, mother of Apollo and Artemis. The chief seats of her legend are Delos and Delphi, and the generally accepted tradition is a union of the legends of these two places. Leto, pregnant by Zeus, seeks for a place of refuge to be delivered. After long wandering she reaches the barren isle of Delos, which, according to Pindar (Frag. 87, 88), was a wandering rock borne about by the waves till it was fixed to the bottom of the sea for the birth of Apollo and Artemis. In the oldest forms of the legend Hera is not mentioned; but afterwards the wanderings of Leto are ascribed to the jealousy of that goddess, enraged at her amour with Zeus. The foundation of Delphi follows immediately on the birth of the god; and on the sacred way between Tempe and Delphi the giant Tityus offers violence to Leto, and is immediately slain by the arrows of Apollo and Artemis (*Odyssey*, xi. 576-581; Apollodorus i. 4). Such are the main facts of the

Leto legend in its common literary form, which is due especially to the two Homeric hymns to Apollo. But Leto is a real goddess, not a mere mythological figure. The honour paid to her in Delphi and Delos might be explained as part of the cult of her son Apollo; but temples to her existed in Argos, in Mantineia and in Xanthus in Lycia; her sacred grove was on the coast of Crete. In Lycia graves are frequently placed under her protection, and she is also known as a goddess of fertility and as κουροτρόφος. It is to be observed that she appears far more conspicuously in the Apolline myths than in those which grew round the great centres of Artemis worship, the reason being that the idea of Apollo and Artemis as twins is one of later growth on Greek soil. Lycia, one of the chief seats of the cult of Apollo, where most frequent traces are found of the worship of Leto as the great goddess, was probably the earlier home of her religion.

In Greek art Leto usually appears carrying her children in her arms, pursued by the dragon sent by the jealous Hera, which is slain by the infant Apollo; in vase paintings especially she is often represented with Apollo and Artemis. The statue of Leto in the Letoön at Argos was the work of Praxiteles.



## LATOUCHE, HYACINTHE JOSEPH ALEXANDRE THABAUD DE

[known as Henri] (1785-1851), French poet and novelist, was born at La Châtre (Indre) on the 2nd of February 1785. Among his works may be distinguished his comedies: *Projets de sagesse* (1811), and, in collaboration with Émile Deschamps, *Selmours de Florian* (1818), which ran for a hundred nights; also *La Reine d'Espagne* (1831), which proved too indecent for the public taste; a novel, *Fragoletta: Naples et Paris en 1799* (1829), which attained a success of notoriety; *La Vallée aux coups* (1833), a volume of prose essays and verse; and two volumes of poems, *Les Adieux* (1843) and *Les Agrestes* (1844). Latouche's chief claim to remembrance is that he revealed to the world the genius of André Chénier, then only known to a limited few. The remains of the poet's work had passed from the hands of Daunou to Latouche, who had sufficient critical insight instantly to recognize their value. In editing the first selection of Chénier's poems (1819) he made some trifling emendations, but did not, as Béranger afterwards asserted, make radical and unnecessary changes. Latouche was guilty of more than one literary fraud. He caused a licentious story of his own to be attributed to the duchesse de Duras, the irreproachable author of *Ourika*. He made many enemies by malicious attacks on his contemporaries. The *Constitutionnel* was suppressed in 1817 by the government for an obscure political allusion in an article by Latouche. He then undertook the management of the *Mercure du XIX^e^ siècle*, and began a bitter warfare against the monarchy. After 1830 he edited the *Figaro*, and spared neither the liberal politicians nor the romanticists who triumphed under the monarchy of July. In his turn he was violently attacked by Gustave Planche in the *Revue des deux mondes* for November 1831. But it must be remembered to the credit of Latouche that he did much to encourage George Sand at the beginning of her career. The last twenty years of his life were spent in retirement at Aulnay, where he died on the 9th of March 1851.

Sainte-Beuve, in the *Causeries du lundi*, vol. 3, gives a not too sympathetic portrait of Latouche. See also George Sand in the *Siècle* for the 18th, 19th and 20th of July 1851.

## LA TOUR, MAURICE QUENTIN DE

(1704-1788), French pastellist, was born at St Quentin on the 5th of September 1704. After leaving Picardy for Paris in 1727 he entered the studio of Spoède—an upright man, but a poor master, rector of the academy of St Luke, who still continued, in the teeth of the Royal Academy, the traditions of the old gild of the master painters of Paris. This possibly contributed to the adoption by La Tour of a line of work foreign to that imposed by an academical training; for pastels, though occasionally used, were not a principal and distinct branch of work until 1720, when Rosalba Carriera

brought them into fashion with the Parisian world. In 1737 La Tour exhibited the first of that splendid series of a hundred and fifty portraits which formed the glory of the Salon for the succeeding thirty-seven years. In 1746 he was received into the academy; and in 1751, the following year to that in which he received the title of painter to the king, he was promoted by that body to the grade of councillor. His work had the rare merit of satisfying at once both the taste of his fashionable models and the judgment of his brother artists. His art, consummate of its kind, achieved the task of flattering his sitters, whilst hiding that flattery behind the just and striking likeness which, says Pierre Jean Mariette, he hardly ever missed. His portraits of Rousseau, of Voltaire, of Louis XV., of his queen, of the dauphin and dauphiness, are at once documents and masterpieces unsurpassed except by his life-size portrait of Madame de Pompadour, which, exhibited at the Salon of 1755, became the chief ornament of the cabinet of pastels in the Louvre. The museum of St Quentin also possesses a magnificent collection of works which at his death were in his own hands. La Tour retired to St Quentin at the age of 80, and there he died on the 18th of February 1788. The riches amassed during his long life were freely bestowed by him in great part before his death; he founded prizes at the school of fine arts in Paris and for the town of Amiens, and endowed St Quentin with a great number of useful and charitable institutions. He never married, but lived on terms of warm affection with his brother (who survived him, and left to the town the drawings now in the museum); and his relations to Mlle Marie Fel (1713-1789), the celebrated singer, were distinguished by a strength and depth of feeling not common to the loves of the 18th century.

See, in addition to the general works on French art, C. Desmeze, *M. Q. de La Tour, peintre du roi* (1854); Champfleury, *Les Peintres de Laon et de St Quentin* (1855); and “La Tour” in the *Collection des artistes célèbres* (1886); E. and J. de Goncourt, *La Tour* (1867); Guiffrey and M. Tourneux, *Correspondance inédite de M. G. de la Tour* (1885); Tourneux, *La Tour, biographie critique* (1904); and *Patoux, L’Œuvre de M. Quentin de la Tour au musée de St Quentin* (St Quentin, 1882).

## LA TOUR D’AUVERGNE, THÉOPHILE MALO

(1743-1800), French soldier, was born at Carhaix in Brittany on the 23rd of December 1743, the son of an advocate named Corret. His desire for a military career being strongly marked, he was enabled, by the not uncommon device of producing a certificate of nobility signed by his friends, first to be nominally enlisted in the Maison du Roi, and soon afterwards to receive a commission in the line, under the name of Corret de Kerbaufret. Four years after joining, in 1771, he assumed by leave of the duke of Bouillon the surname of La Tour d’Auvergne, being in fact descended from an illegitimate half-brother of the great Turenne. Many years of routine service with his regiment were broken only by his participation as a volunteer in the duc de Crillon’s Franco-Spanish expedition to Minorca in 1781. This led to an offer of promotion into the Spanish army, but he refused to change his allegiance. In 1784 he was promoted captain, and in 1791 he received the cross of St Louis. In the early part of the Revolution his patriotism was still more conspicuously displayed in his resolute opposition to the proposals of many of his brother officers in the Angoumois regiment to emigrate rather than to swear to the constitution. In 1792 his lifelong interest in numismatics and questions of language was shown by a work which he published on the Bretons. At this time he was serving under Montesquiou in the Alps, and although there was only outpost fighting he distinguished himself by his courage and audacity, qualities which were displayed in more serious fighting in the Pyrenees the next year. He declined well-earned promotion to colonel, and, being broken in health and compelled, owing to the loss of his teeth, to live on milk, he left the army in 1795. On his return by sea to Brittany he was captured by the English and held prisoner for two years. When released, he settled at Passy and published *Origines gauloises*, but in 1797, on the appeal of an old friend whose son had been taken as a conscript, he volunteered as the youth’s substitute, and served on the Rhine (1797) and in Switzerland (1798-1799) as a captain. In recognition of his singular bravery and modesty Carnot obtained a decree from the first consul naming La Tour d’Auvergne “first grenadier of France” (27th of April 1800). This led him to volunteer again, and he was killed in action at Oberhausen, near Donauwörth, on the 27th of June 1800.

La Tour d’Auvergne’s almost legendary courage had captivated the imagination of the

French soldier, and his memory was not suffered to die. It was customary for the French troops and their allies of the Rhine Confederation under Napoleon to march at attention when passing his burial-place on the battlefield. His heart was long carried by the grenadier company of his regiment, the 46th; after being in the possession of Garibaldi for many years, it was finally deposited in the keeping of the city of Paris in 1883. But the most striking tribute to his memory is paid to-day as it was by order of the first consul in 1800. "His name is to be kept on the pay list and roll of his company. It will be called at all parades and a non-commissioned officer will reply, *Mort au champ d'honneur*." This custom, with little variation, is still observed in the 46th regiment on all occasions when the colour is taken on parade.



**LATREILLE, PIERRE ANDRÉ** (1762-1833), French naturalist, was born in humble circumstances at Brives-la-Gaillarde (Corrèze), on the 20th of November 1762. In 1778 he entered the collège Lemoine at Paris, and on his admission to priestly orders in 1786 he retired to Brives, where he devoted all the leisure which the discharge of his professional duties allowed to the study of entomology. In 1788 he returned to Paris and found means of making himself known to the leading naturalists there. His "Mémoire sur les mutilles découvertes en France," contributed to the *Proceedings* of the Society of Natural History in Paris, procured for him admission to that body. At the Revolution he was compelled to quit Paris, and as a priest of conservative sympathies suffered considerable hardship, being imprisoned for some time at Bordeaux. His *Précis des caractères génériques des insectes, disposés dans un ordre naturel*, appeared at Brives in 1796. In 1798 he became a corresponding member of the Institute, and at the same time was entrusted with the task of arranging the entomological collection at the recently organized Muséum d'Histoire Naturelle (Jardin des Plantes); in 1814 he succeeded G. A. Olivier as member of the Académie des Sciences, and in 1821 he was made a chevalier of the Legion of Honour. For some time he acted as professor of zoology in the veterinary school at Alfort near Paris, and in 1830, when the chair of zoology of invertebrates at the Muséum was divided after the death of Lamarck, Latreille was appointed professor of zoology of crustaceans, arachnids and insects, the chair of molluscs, worms and zoophytes being assigned to H. M. D. de Blainville. "On me donne du pain quand je n'ai plus de dents," said Latreille, who was then in his sixty-eighth year. He died in Paris on the 6th of February 1833.

In addition to the works already mentioned, the numerous works of Latreille include: *Histoire naturelle générale et particulière des crustacés et insectes* (14 vols., 1802-1805), forming part of C. N. S. Sonnini's edition of Buffon; *Genera crustaceorum et insectorum, secundum ordinem naturalem in familias disposita* (4 vols., 1806-1807); *Considérations générales sur l'ordre naturel des animaux composant les classes des crustacés, des arachnides, et des insectes* (1810); *Familles naturelles du règne animal, exposées succinctement et dans un ordre analytique* (1825); *Cours d'entomologie* (of which only the first volume appeared, 1831); the whole of the section "Crustacés, Arachnides, Insectes," in G. Cuvier's *Règne animal*; besides many papers in the *Annales du Muséum*, the *Encyclopédie méthodique*, the *Dictionnaire classique d'histoire naturelle* and elsewhere.

**LA TRÉMOILLE**, an old French family which derives its name from a village (the modern La Trimouille) in the department of Vienne. The family has been known since the middle of the 11th century, and since the 14th century its members have been conspicuous in French history. Guy, sire de la Trémoille, standard-bearer of France, was taken prisoner at the battle of Nicopolis (1396), and Georges, the favourite of King Charles VII., was captured at Agincourt (1415). Louis (2), called the *chevalier sans reproche*, defeated and captured the duke of Orleans at the battle of Saint Aubin-du-Cormier (1488), distinguished

himself in the wars in Italy, and was killed at Pavia (1525). In 1521 François (2) acquired a claim on the kingdom of Naples by his marriage with Anne de Laval, daughter of Charlotte of Aragon. Louis (3) became duke of Thouars in 1563, and his son Claude turned Protestant, was created a peer of France in 1595, and married a daughter of William the Silent in 1598. To this family belonged the lines of the counts of Joigny, the marquises of Royan and counts of Olonne, and the marquises and dukes of Noirmoutier.

LATROBE, CHARLES JOSEPH (1801-1875), Australian governor, was born in London on the 20th of March 1801. The Latrobes were of Huguenot extraction, and belonged to the Moravian community, of which the father and grandfather of C. J. Latrobe were ministers. His father, Christian Ignatius Latrobe (1758-1836), a musician of some note, did good service in the direction of popularizing classical music in England by his *Selection of Sacred Music from the Works of the most Eminent Composers of Germany and Italy* (6 vols., 1806-1825). C. J. Latrobe was an excellent mountaineer, and made some important ascents in Switzerland in 1824-1826. In 1832 he went to America with Count Albert Pourtales, and in 1834 crossed the prairies from New Orleans to Mexico with Washington Irving. In 1837 he was invested with a government commission in the West Indies, and two years later was made superintendent of the Port Philip district of New South Wales. When Port Philip was erected into a separate colony as Victoria in 1851, Latrobe became lieutenant-governor. The discovery of gold in that year attracted enormous numbers of immigrants annually. Latrobe discharged the difficult duties of government at this critical period with tact and success. He retired in 1854, became C.B. in 1858 and died in London on the 2nd of December 1875. Beside some volumes of travel he published a volume of poems, *The Solace of Song* (1837).

See *Brief Notices of the Latrobe Family* (1864), a privately printed translation of an article revised by members of the family in the Moravian *Brüderbote* (November 1864).

LATTEN (from O. Fr. *laton*, mod. Fr. *laiton*, possibly connected with Span. *lata*, Ital. *latta*, a lath), a mixed metal like brass, composed of copper and zinc, generally made in thin sheets, and used especially for monumental brasses and effigies. A fine example is in the screen of Henry VII.'s tomb in Westminster Abbey. There are three forms of latten, "black latten," unpolished and rolled, "shaven latten," of extreme thinness, and "roll latten," of the thickness either of black or shaven latten, but with both sides polished.

LATTICE LEAF PLANT, in botany, the common name for *Ouvirandra fenestralis*, an aquatic monocotyledonous plant belonging to the small natural order Aponogetonaceae and a native of Madagascar. It has a singular appearance from the structure of the leaves, which are oblong in shape, from 6 to 18 in. long and from 2 to 4 in. broad; they spread horizontally beneath the surface of the water, and are reduced to little more than a lattice-like network of veins. The tuberculate roots are edible. The plant is grown in cultivation as a stove-aquatic.

**LATUDE, JEAN HENRI,** often called Danry or Masers de Latude (1725-1805), prisoner of the Bastille, was born at Montagnac in Gascony on the 23rd of March 1725. He received a military education and went to Paris in 1748 to study mathematics. He led a dissipated life and endeavoured to curry favour with the marquise de Pompadour by secretly sending her a box of poison and then informing her of the supposed plot against her life. The ruse was discovered, and Mme de Pompadour, not appreciating the humour of the situation, had Latude put in the Bastille on the 1st of May 1749. He was later transferred to Vincennes, whence he escaped in 1750. Retaken and reimprisoned in the Bastille, he made a second brief escape in 1756. He was transferred to Vincennes in 1764, and the next year made a third escape and was a third time recaptured. He was put in a madhouse by Malesherbes in 1775, and discharged in 1777 on condition that he should retire to his native town. He remained in Paris and was again imprisoned. A certain Mme Legros became interested in him through chance reading of one of his memoirs, and, by a vigorous agitation in his behalf, secured his definite release in 1784. He exploited his long captivity with considerable ability, posing as a brave officer, a son of the marquis de la Tude, and a victim of Pompadour's intrigues. He was extolled and pensioned during the Revolution, and in 1793 the convention compelled the heirs of Mme de Pompadour to pay him 60,000 francs damages. He died in obscurity at Paris on the 1st of January 1805.

The principal work of Latude is the account of his imprisonment, written in collaboration with an advocate named Thiéry, and entitled *Le Despotisme dévoilé, ou Mémoires de Henri Masers de la Tude, détenu pendant trente-cinq ans dans les diverses prisons d'état* (Amsterdam, 1787, ed. Paris, 1889). An Eng. trans. of a portion was published in 1787. The work is full of lies and misrepresentations, but had great vogue at the time of the French Revolution. Latude also wrote essays on all sorts of subjects.

See J. F. Barrière, *Mémoires de Linguet et de Latude* (1884); G. Bertin, *Notice* in edition of the *Mémoires* (1889); F. Funck-Brentano, "Latude," in the *Revue des deux mondes* (1st October 1889).

**LATUKA,** a tribe of negroid stock inhabiting the mountainous country E. of Gondokoro on the upper Nile. They have received a tinge of Hamitic blood from the Galla people, and have high foreheads, large eyes, straight noses and thick but not pouting lips. They are believed by Sir H. H. Johnston to be the original and purest type of the great Masai people, and are assimilated to the Nilotic negro races in customs. Like their neighbours the Bari and Shilluk tribes, they despise clothing, though the important chiefs have adopted Arab attire. Their country is fertile, and they cultivate tobacco, durra and other crops. Their villages are numerous, and some are of considerable size. Tarangole, for instance, on the Khor Kohs, has upwards of three thousand huts, and sheds for many thousands of cattle. The Latuka are industrious and especially noted for skill as smiths. Emin Pasha stated that the lion was so little dreaded by the Latuka that on one being caught in a leopard trap they hastily set it free.



**LAUBAN,** a town of Germany in the Prussian province of Silesia, is situated in a picturesque valley, at the junction of the lines of railway from Görlitz and Sorau, 16 m. E. of

the former. Pop. (1905) 14,624. Lauban has a Roman Catholic and two Evangelical churches, a town hall, dating from 1541, a conventual house of the order of St Magdalene, dating from the 14th century, a municipal library and museum, two hospitals, an orphanage and several schools. Its industrial establishments comprise tobacco, yarn, thread, linen and woollen cloth manufactories, bleaching and dyeing works, breweries and oil and flour mills.

Lauban was founded in the 10th and fortified in the 13th century; in 1427 and 1431 it was devastated by the Hussites, and in 1640 by the Swedes. In 1761 it was the headquarters of Frederick the Great, and in 1813 it was the last Saxon town that made its submission to Prussia.

See Berkel, *Geschichte der Stadt Lauban* (Lauban, 1896).

LAUBE, HEINRICH (1806-1884), German dramatist, novelist and theatre-director, was born at Sprottau in Silesia on the 18th of September 1806. He studied theology at Halle and Breslau (1826-1829), and settled in Leipzig in 1832. Here he at once came into prominence with his political essays, collected under the title *Das neue Jahrhundert*, in two parts—*Polen* (1833) and *Politische Briefe* (1833)—and with the novel *Das junge Europa*, in three parts—*Die Poeten*, *Die Krieger*, *Die Bürger*—(1833-1837). These writings, in which, after the fashion of Heinrich Heine and Ludwig Börne, he severely criticized the political régime in Germany, together with the part he played in the literary movement known as *Das junge Deutschland*, led to his being subjected to police surveillance and his works confiscated. On his return, in 1834, from a journey to Italy, undertaken in the company of Karl Gutzkow, Laube was expelled from Saxony and imprisoned for nine months in Berlin. In 1836 he married the widow of Professor Hänel of Leipzig; almost immediately afterwards he suffered a year's imprisonment for his revolutionary sympathies. In 1839 he again settled in Leipzig and began a literary activity as a playwright. Chief among his earlier productions are the tragedies *Monaldeschi* (1845) and *Struensee* (1847); the comedies *Rokoko, oder die alten Herren* (1846); *Gottsched und Gellert* (1847); and *Die Karlsschüler* (1847), of which the youthful Schiller is the hero. In 1848 Laube was elected to the national assembly at Frankfort-on-Main for the district of Elbogen, but resigned in the spring of 1849, when he was appointed artistic director of the Hofburg theatre in Vienna. This office he held until 1867, and in this period fall his finest dramatic productions, notably the tragedies *Graf Essex* (1856) and *Montrose* (1859), and his historical romance *Der deutsche Krieg* (1865-1866, 9 vols.), which graphically pictures a period in the Thirty Years' War. In 1869 he became director of the Leipzig Stadttheater, but returned to Vienna in 1870, where in 1872 he was placed at the head of the new Stadttheater; with the exception of a short interval he managed this theatre with brilliant success until his retirement from public life in 1880. He has left a valuable record of his work in Vienna and Leipzig in the three volumes *Das Burgtheater* (1868), *Das norddeutsche Theater* (1872) and *Das Wiener Stadttheater* (1875). His pen was still active after his retirement, and in the five years preceding his death, which took place at Vienna on the 1st of August 1884, he wrote the romances and novels *Die Böhminger* (1880), *Louison* (1881), *Der Schatten-Wilhelm* (1883), and published an interesting volume of reminiscences, *Erinnerungen, 1841-1881* (1882). Laube's dramas are not remarkable for originality or for poetical beauty; their real and great merit lies in their stage-craft. As a theatre-manager he has had no equal in Germany, and his services in this capacity have assured him a more lasting name in German literary history than his writings.

His *Gesammelte Schriften* (excluding his dramas) were published in 16 vols. (1879-1882); his *Dramatische Werke*, in 13 vols. (1845-1875); a popular edition of the latter in 12 vols. (1880-1892). An edition of Laube's *Ausgewählte Werke* in 10 vols. appeared in 1906 with an introduction by H. H. Houben. See also J. Proelss, *Das junge Deutschland* (1892); and H. Bulthaupt, *Dramaturgie des Schauspiels* (vol. iii., 6th ed., 1901).

L’AUBESPINE, a French family which sprang from Claude de l’Aubespine, a lawyer of Orleans and bailiff of the abbey of St Euverte in the beginning of the 16th century, and rapidly acquired distinction in offices connected with the law. Sebastien de l’Aubespine (d. 1582), abbot of Bassefontaine, bishop of Vannes and afterwards of Limoges, fulfilled important diplomatic missions in Germany, Hungary, England, the Low Countries and Switzerland under Francis I. and his successors. Claude (*c.* 1500-1567), baron of Châteauneuf-sur-Cher, Sebastien’s brother, was a secretary of finance; he had charge of negotiations with England in 1555 and 1559, and was several times commissioned to treat with the Huguenots in the king’s name. His son Guillaume was a councillor of state and ambassador to England. Charles de l’Aubespine (1580-1653) was ambassador to Germany, the Low Countries, Venice and England, besides twice holding the office of keeper of the seals of France, from 1630 to 1633, and from 1650 to 1651. The family fell into poor circumstances and became extinct in the 19th century.

(M. P.*)

LAUCHSTÄDT, a town of Germany in the province of Prussian Saxony, on the Laucha, 6 m. N.W. of Merseburg by the railway to Schafstädt. Pop. (1905) 2034. It contains an Evangelical church, a theatre, a hydropathic establishment and several educational institutions, among which is an agricultural school affiliated to the university of Halle. Its industries include malting, vinegar-making and brewing. Lauchstädt was a popular watering-place in the 18th century, the dukes of Saxe-Merseburg often making it their summer residence. From 1789 to 1811 the Weimar court theatrical company gave performances here of the plays of Schiller and Goethe, an attraction which greatly contributed to the well-being of the town.

See Maak, *Das Goethetheater in Lauchstädt* (Lauchstädt, 1905); and Nasemann, *Bad Lauchstädt* (Halle, 1885).

LAUD, WILLIAM (1573-1645), English archbishop, only son of William Laud, a clothier, was born at Reading on the 7th of October 1573. He was educated at Reading free school, matriculated at St John’s college, Oxford, in 1589, gained a scholarship in 1590, a fellowship in 1593, and graduated B.A. in 1594, proceeding to D.D. in 1608. In 1601 he took orders, in 1603 becoming chaplain to Charles Blount, earl of Devonshire. Laud early took up a position of antagonism to the Calvinistic party in the church, and in 1604 was reproved by the authorities for maintaining in his thesis for the degree of B.D. “that there could be no true church without bishops,” and again in 1606 for advocating “popish” opinions in a sermon at St Mary’s. If high-church doctrines, however, met with opposition at Oxford, they were relished elsewhere, and Laud obtained rapid advancement. In 1607 he was made vicar of Stanford in Northamptonshire, and in 1608 he became chaplain to Bishop Neile, who in 1610 presented him to the living of Cuxton, when he resigned his fellowship. In 1611, in spite of the influence of Archbishop Abbot and Lord Chancellor Ellesmere, Laud was made president of St John’s, and in 1614 obtained in addition the prebend of Buckden, in 1615 the archdeaconry of Huntingdon, and in 1616 the deanery of Gloucester. Here he repaired the fabric and changed the position of the communion table, a matter which aroused great religious controversy, from the centre of the choir to the east end, by a characteristic tactless exercise of power offending the bishop, who henceforth refused to enter the cathedral. In 1617 he went with the king to Scotland, and aroused hostility by wearing the surplice. In 1621 he became bishop of St David’s, when he resigned the presidentship of St John’s.



In April 1622 Laud, by the king’s orders, took part in a controversy with Percy, a Jesuit,

known as Fisher, the aim of which was to prevent the conversion of the countess of Buckingham, the favourite's mother, to Romanism, and his opinions expressed on that occasion show considerable breadth and comprehension. While refusing to acknowledge the Roman Church as *the* true church, he allowed it to be *a* true church and a branch of the Catholic body, at the same time emphasizing the perils of knowingly associating with error; and with regard to the English Church he denied that the acceptance of all its articles was necessary. The foundation of belief was the Bible, not any one branch of the Catholic church arrogating to itself infallibility, and when dispute on matters of faith arose, "a lawful and free council, determining according to Scripture, is the best judge on earth." A close and somewhat strange intimacy, considering the difference in the characters and ideals of the two men, between Laud and Buckingham now began, and proved the chief instrument of Laud's advancement. The opportunity came with the old king's death in 1625, for James, with all his pedantry, was too wise and cautious to embark in Laud's rash undertakings, and had already shown a prudent moderation, after setting up bishops in Scotland, in going no further in opposition to the religious feelings of the people. On the accession of Charles, Laud's ambitious activities were allowed free scope. A list of the clergy was immediately prepared by him for the king, in which each name was labelled with an O or a P, distinguishing the Orthodox to be promoted from the Puritans to be suppressed. Laud defended Richard Montague, who had aroused the wrath of the parliament by his pamphlet against Calvinism. His influence soon extended into the domain of the state. He supported the king's prerogative throughout the conflict with the parliament, preached in favour of it before Charles's second parliament in 1626, and assisted in Buckingham's defence. In 1626 he was nominated bishop of Bath and Wells, and in July 1628 bishop of London. On the 12th of April 1629 he was made chancellor of Oxford University.

In the patronage of learning and in the exercise of authority over the morals and education of youth Laud was in his proper sphere, many valuable reforms at Oxford being due to his activity, including the codification of the statutes, the statute by which public examinations were rendered obligatory for university degrees, and the ordinance for the election of proctors, the revival of the college system, of moral and religious discipline and order, and of academic dress. He founded or endowed various professorships, including those of Hebrew and Arabic, and the office of public orator, encouraged English and foreign scholars, such as Voss, Selden and Jeremy Taylor, founded the university printing press, procuring in 1633 the royal patent for Oxford, and obtained for the Bodleian library over 1300 MSS., adding a new wing to the building to contain his gifts. His rule at Oxford was marked by a great increase in the number of students. In his own college he erected the new buildings, and was its second founder. Of his chancellorship he himself wrote a history, and the Laudian tradition long remained the great standard of order and good government in the university. Elsewhere he showed his liberality and his zeal for reform. He was an active visitor of Eton and Winchester, and endowed the grammar school at Reading, where he was himself educated. In London he procured funds for the restoration of the dilapidated cathedral of St Paul's.

He was far less great as a ruler in the state, showing as a judge a tyrannical spirit both in the star chamber and high-commission court, threatening Felton, the assassin of Buckingham, with the rack, and showing special activity in procuring a cruel sentence in the former court against Alexander Leighton in June 1630 and against Henry Sherfield in 1634. His power was greatly increased after his return from Scotland, whither he had accompanied the king, by his promotion to the archbishopric of Canterbury in August 1633. "As for the state indeed," he wrote to Wentworth on this occasion, "I am for *Thorough*." In 1636 the privy council decided in his favour his claim of jurisdiction as visitor over both universities. Soon afterwards he was placed on the commission of the treasury and on the committee of the privy council for foreign affairs. He was all-powerful both in church and state. He proceeded to impose by authority the religious ceremonies and usages to which he attached so much importance. His vicar-general, Sir Nathaniel Brent, went through the dioceses of his province, noting every dilapidation and every irregularity. The pulpit was no longer to be the chief feature in the church, but the communion table. The Puritan lecturers were suppressed. He showed great hostility to the Puritan sabbath and supported the reissue of the *Book of Sports*, especially odious to that party, and severely reprimanded Chief Justice Richardson for his interference with the Somerset wakes. He insisted on the use of the prayer-book among the English soldiers in the service of Holland, and forced strict conformity on the church of the merchant adventurers at Delft, endeavouring even to reach the colonists in New England. He tried to compel the Dutch and French refugees in England to unite with the Church of England, advising double taxation and other forms of persecution. In 1634 the justices of the peace were ordered to enter houses to search for

persons holding conventicles and bring them before the commissioners. He took pleasure in displaying his power over the great, and in punishing them in the spiritual courts for moral offences. In 1637 he took part in the sentence of the star chamber on Prynne, Bastwick and Burton, and in the same year in the prosecution of Bishop Williams. He urged Strafford in Ireland to carry out the same reforms and severities.

He was now to extend his ecclesiastical system to Scotland, where during his visits the appearance of the churches had greatly displeased him. The new prayer-book and canons were drawn up by the Scottish bishops with his assistance and enforced in the country, and, though not officially connected with the work, he was rightly regarded as its real author. The attack not only on the national religion, but on the national independence of Scotland, proved to be the point at which the system, already strained, broke and collapsed. Laud continued to support Strafford's and the king's arbitrary measures to the last, and spoke in favour of the vigorous continuation of the war on Strafford's side in the memorable meeting of the committee of eight on the 5th of May 1640, and for the employment of any means for carrying it on. "Tried all ways," so ran the notes of his speech, "and refused all ways. By the law of God and man you should have subsistence and lawful to take it." Though at first opposed to the sitting of convocation, after the dissolution of parliament, as an independent body, on account of the opposition it would arouse, he yet caused to be passed in it the new canons which both enforced his ecclesiastical system and assisted the king's divine right, resistance to his power entailing "damnation." Laud's infatuated policy could go no further, and the *etcetera* oath, according to which whole classes of men were to be forced to swear perpetual allegiance to the "government of this church by archbishops, bishops, deans and archdeacons, &c.," was long remembered and derided. His power now quickly abandoned him. He was attacked and reviled as the chief author of the troubles on all sides. In October he was ordered by Charles to suspend the *etcetera* oath. The same month, when the high commission court was sacked by the mob, he was unable to persuade the star chamber to punish the offenders. On the 18th of December he was impeached by the Long Parliament, and on the 1st of March imprisoned in the tower. On the 12th of May, at Strafford's request, the archbishop appeared at the window of his cell to give him his blessing on his way to execution, and fainted as he passed by. For some time he was left unnoticed in confinement. On the 31st of May 1643, however, Prynne received orders from the parliament to search his papers, and published a mutilated edition of his diary. The articles of impeachment were sent up to the Lords in October, the trial beginning on the 12th of March 1644, but the attempt to bring his conduct under a charge of high treason proving hopeless, an attainder was substituted and sent up to the Lords on the 22nd of November. In these proceedings there was no semblance of respect for law or justice, the Lords yielding (4th of January 1645) to the menaces of the Commons, who arrogated to themselves the right to declare any crimes they pleased high treason. Laud now tendered the king's pardon, which had been granted to him in April 1643. This was rejected, and it was with some difficulty that his petition to be executed with the axe, instead of undergoing the ordinary brutal punishment for high treason, was granted. He suffered death on the 10th of January on Tower Hill, asserting his innocence of any offence known to the law, repudiating the charge of "popery," and declaring that he had always lived in the Protestant Church of England. He was buried in the chancel of All Hallows, Barking, whence his body was removed on the 24th of July 1663 to the chapel of St John's College, Oxford.



Laud never married. He is described by Fuller as "low of stature, little in bulk, cheerful in countenance (wherein gravity and quickness were all compounded), of a sharp and piercing eye, clear judgment and (abating the influence of age) firm memory." His personality, on account of the sharp religious antagonisms with which his name is inevitably associated, has rarely been judged with impartiality. His severities were the result of a narrow mind and not of a vindictive spirit, and their number has certainly been exaggerated. His career was distinguished by uprightness, by piety, by a devotion to duty, by courage and consistency. In particular it is clear that the charge of partiality for Rome is unfounded. At the same time the circumstances of the period, the fact that various schemes of union with Rome were abroad, that the missions of Panzani and later of Conn were gathering into the Church of Rome numbers of members of the Church of England who, like Laud himself, were dissatisfied with the Puritan bias which then characterized it, the incident mentioned by Laud himself of his being twice offered the cardinalate, the movement carried on at the court in favour of Romanism, and the fact that Laud's changes in ritual, however clearly defined and restricted in his own intention, all tended towards Roman practice, fully warranted the suspicions and fears of his contemporaries. Laud's complete neglect of the national sentiment, in his belief that the exercise of mere power was sufficient to suppress it, is a principal proof of his total lack of true statesmanship. The hostility to "innovations in

religion," it is generally allowed, was a far stronger incentive to the rebellion against the arbitrary power of the crown, than even the violation of constitutional liberties; and to Laud, therefore, more than to Strafford, to Buckingham, or even perhaps to Charles himself, is especially due the responsibility for the catastrophe. He held fast to the great idea of the catholicity of the English Church, to that conception of it which regards it as a branch of the whole Christian church, and emphasizes its historical continuity and identity from the time of the apostles, but here again his policy was at fault; for his despotic administration not only excited and exaggerated the tendencies to separatism and independentism which finally prevailed, but excluded large bodies of faithful churchmen from communion with their church and from their country. The emigration to Massachusetts in 1629, which continued in a stream till 1640, was not composed of separatists but of episcopalians. Thus what Laud grasped with one hand he destroyed with the other.

Passing to the more indirect influence of Laud on his times, we can observe a narrowness of mind and aim which separates him from a man of such high imagination and idealism as Strafford, however closely identified their policies may have been for the moment. The chief feature of Laud's administration is attention to countless details, to the most trivial of which he attached excessive importance, and which are uninspired by any great underlying principle. His view was always essentially material. The one element in the church which to him was all essential was its visibility. This was the source of his intense dislike of the Puritan and Nonconformist conception of the church, which afforded no tangible or definite form. Hence the necessity for outward conformity, and the importance attached to ritual and ceremony, unity in which must be established at all costs, in contrast to dogma and doctrine, in which he showed himself lenient and large-minded, winning over Hales by friendly discussion, and encouraging the publication of Chillingworth's *Religion of Protestants*. He was not a bigot, but a martinet. The external form was with him the essential feature of religion, preceding the spiritual conception, and in Laud's opinion being the real foundation of it. In his last words on the scaffold he alludes to the dangers and slanders he had endured labouring to keep an uniformity in the external service of God; and Bacon's conception of a spiritual union founded on variety and liberty was one completely beyond his comprehension.

This narrow materialism was the true cause of his fatal influence both in church and state. In his own character it produced the somewhat blunted moral sense which led to the few incidents in his career which need moral defence, his performance of the marriage ceremony between his first patron Lord Devonshire and the latter's mistress, the divorced wife of Lord Rich, an act completely at variance with his principles; his strange intimacy with Buckingham; his love of power and place. Indistinguishable from his personal ambition was his passion for the aggrandisement of the church and its predominance in the state. He was greatly delighted at the foolish appointment of Bishop Juxon as lord treasurer in 1636. "No churchman had it," he cries exultingly, "since Henry VII.'s time, ... and now if the church will not hold up themselves under God, I can do no more." Spiritual influence, in Laud's opinion, was not enough for the church. The church as the guide of the nation in duty and godliness, even extending its activity into state affairs as a mediator and a moderator, was not sufficient. Its power must be material and visible, embodied in great places of secular administration and enthroned in high offices of state. Thus the church, descending into the political arena, became identified with the doctrines of one political party in the state—doctrines odious to the majority of the nation—and at the same time became associated with acts of violence and injustice, losing at once its influence and its reputation. Equally disastrous to the state was the identification of the king's administration with one party in the church, and that with the party in an immense minority not only in the nation but even among the clergy themselves.

BIBLIOGRAPHY.—All Laud's works are to be found in the *Library of Anglo-Catholic Theology* (7 vols.), including his sermons (of no great merit), letters, history of the chancellorship, history of his troubles and trial, and his remarkable diary, the MSS. of the last two works being the property of St John's College. Various modern opinions of Laud's career can be studied in T. Longueville's *Life of Laud, by a Romish Recusant* (1894); *Congregational Union Jubilee Lectures*, vol. i. (1882); J. B. Mozley's *Essay on Laud; Archbishop Laud*, by A. C. Benson (1887); *Wm. Laud*, by W. H. Hutton (1895); *Archbishop Laud Commemoration*, ed. by W. F. Collins (lectures, bibliography, catalogue of exhibits, 1895); Hook's *Lives of the Archbishops of Canterbury*; and H. Bell, *Archbishop Laud and Priestly Government* (1907).

(P. C. Y.)

**LAUD** (Lat. *laus*), a term meaning praise, now rarely found in this sense except in poetry or hymns. Lauds is the name for the second of the offices of the canonical hours in the Roman breviary, so called from the three *laudes* or psalms of praise, cxlviii.-cl. which form part of the service (see BREVIARY and HOURS, CANONICAL).

**LAUDANUM,** originally the name given by Paracelsus to a famous medical preparation of his own composed of gold, pearls, &c. (*Opera*, 1658, i. 492/2), but containing opium as its chief ingredient. The term is now only used for the alcoholic tincture of opium (*q.v.*). The name was either invented by Paracelsus from Lat. *laudare* to praise, or was a corrupted form of "ladanum" (Gr. λήδανον, from Pers. *ladan*), a resinous juice or gum obtained from various kinds of the *Cistus* shrub, formerly used medicinally in external applications and as a stomachic, but now only in perfumery and in making fumigating pastilles, &c.

**LAUDER, SIR THOMAS DICK,** Bart. (1784-1848), Scottish author, only son of Sir Andrew Lauder, 6th baronet, was born at Edinburgh in 1784. He succeeded to the baronetcy in 1820. His first contribution to *Blackwood's Magazine* in 1817, entitled "Simon Roy, Gardener at Dunphail," was by some ascribed to Sir Walter Scott. His paper (1818) on "The Parallel Roads of Glenroy," printed in vol. ix. of the *Transactions of the Royal Society of Edinburgh*, first drew attention to the phenomenon in question. In 1825 and 1827 he published two romances, *Lochandhu* and the *Wolf of Badenoch*. He became a frequent contributor to *Blackwood* and also to *Tait's Magazine*, and in 1830 he published *An Account of the Great Floods of August 1829 in the Province of Moray and adjoining Districts*. Subsequent works were *Highland Rambles, with Long Tales to Shorten the Way* (2 vols. 8vo, 1837), *Legendary Tales of the Highlands* (3 vols, 12mo, 1841), *Tour round the Coasts of Scotland* (1842) and *Memorial of the Royal Progress in Scotland* (1843). Vol. i. of a *Miscellany of Natural History*, published in 1833, was also partly prepared by Lauder. He was a Liberal, and took an active interest in politics; he held the office of secretary to the Board of Scottish Manufactures. He died on the 29th of May 1848. An unfinished series of papers, written for *Tait's Magazine* shortly before his death, was published under the title *Scottish Rivers*, with a preface by John Brown, M.D., in 1874.



**LAUDER, WILLIAM** (d. 1771), Scottish literary forger, was born in the latter part of the 17th century, and was educated at Edinburgh university, where he graduated in 1695. He applied unsuccessfully for the post of professor of humanity there, in succession to Adam Watt, whose assistant he had been for a time, and also for the keepership of the university library. He was a good scholar, and in 1739, published *Poetarum Scotorum Musae Sacrae*, a collection of poems by various writers, mostly paraphrased from the Bible. In 1742 Lauder came to London. In 1747 he wrote an article for the *Gentleman's Magazine* to prove that Milton's *Paradise Lost* was largely a plagiarism from the *Adamus Exul* (1601) of Hugo

Grotius, the *Sarcotis* (1654) of J. Masen (Masenius, 1606-1681), and the *Poemata Sacra* (1633) of Andrew Ramsay (1574-1659). Lauder expounded his case in a series of articles, and in a book (1753) increased the list of plundered authors to nearly a hundred. But his success was short-lived. Several scholars, who had independently studied the alleged sources of Milton's inspiration, proved conclusively that Lauder had not only garbled most of his quotations, but had even inserted amongst them extracts from a Latin rendering of *Paradise Lost*. This led to his exposure, and he was obliged to write a complete confession at the dictation of his former friend Samuel Johnson. After several vain endeavours to clear his character he emigrated to Barbadoes, where he died in 1771.

LAUDER, a royal and police burgh of Berwickshire, Scotland. Pop. (1901) 719. It is situated on the Leader, 29 m. S.E. of Edinburgh by the North British railway's branch line from Fountainhall, of which it is the terminus. The burgh is said to date from the reign of William the Lion (1165-1214); its charter was granted in 1502. In 1482 James III. with his court and army rested here on the way to raise the siege of Berwick. While the nobles were in the church considering grievances, Robert Cochrane, recently created earl of Mar, one of the king's favourites, whose "removal" was at the very moment under discussion, demanded admittance. Archibald Douglas, earl of Angus, opened the door and seized Mar, who was forthwith dragged to Lauder Bridge and there, along with six other obnoxious favourites, hanged in sight of his royal master. It was in connexion with this exploit that Angus acquired the nickname of "Bell-the-cat." The public buildings include a town-hall and a library. The parish church was built in 1673 by the earl of Lauderdale, in exchange for the older edifice, the site of which was required for the enlargement of Thirlestane castle, which, originally a fortress, was then remodelled for a residence. The town is a favourite with anglers.

LAUDERDALE, JOHN MAITLAND, Duke of (1616-1682), eldest surviving son of John Maitland, 2nd Lord Maitland of Thirlestane (d. 1645), who was created earl of Lauderdale in 1624, and of Lady Isabel Seton, daughter of Alexander, earl of Dunfermline, and great-grandson of Sir Richard Maitland (*q.v.*), the poet, a member of an ancient family of Berwickshire, was born on the 24th of May 1616, at Lethington. He began public life as a zealous adherent of the Presbyterian cause, took the covenant, sat as an elder in the assembly at St Andrews in July 1643, and was sent to England as a commissioner for the covenant in August, and to attend the Westminster assembly in November. In February 1644 he was a member of the committee of both kingdoms, and on the 20th of November was one of the commissioners appointed to treat with the king at Uxbridge, when he made efforts to persuade Charles to agree to the establishment of Presbyterianism. In 1645 he advised Charles to reject the proposals of the Independents, and in 1647 approved of the king's surrender to the Scots. At this period Lauderdale veered round completely to the king's cause, had several interviews with him, and engaged in various projects for his restoration, offering the aid of the Scots, on the condition of Charles's consent to the establishment of Presbyterianism, and on the 26th of December he obtained from Charles at Carisbrooke "the engagement" by which Presbyterianism was to be established for three years, schismatics were to be suppressed, and the acts of the Scottish parliament ratified, the king in addition promising to admit the Scottish nobles into public employment in England and to reside frequently in Scotland. Returning to Scotland, in the spring of 1648, Lauderdale joined the party of Hamilton in alliance with the English royalists. Their defeat at Preston postponed the arrival of the prince of Wales, but Lauderdale had an interview with the prince in the Downs in August, and from this period obtained supreme influence over the future king. He persuaded him later to accept the invitation to Scotland from the Argyll faction, accompanied him thither in 1650 and in the expedition into England, and was taken prisoner at Worcester in 1651, remaining in confinement till March 1660. He joined Charles in May

1660 at Breda, and, in spite of the opposition of Clarendon and Monk, was appointed secretary of state. From this time onwards he kept his hold upon the king, was lodged at Whitehall, was “never from the king’s ear nor council,”[1] and maintained his position against his numerous adversaries by a crafty dexterity in dealing with men, a fearless unscrupulousness, and a robust strength of will, which overcame all opposition. Though a man of considerable learning and intellectual attainment, his character was exceptionally and grossly licentious, and his base and ignoble career was henceforward unrelieved by a single redeeming feature. He abandoned Argyll to his fate, permitted, if he did not assist in, the restoration of episcopacy in Scotland, and after triumphing over all his opponents in Scotland drew into his own hands the whole administration of that kingdom, and proceeded to impose upon it the absolute supremacy of the crown in church and state, restoring the nomination of the lords of the articles to the king and initiating severe measures against the Covenanters. In 1669 he was able to boast with truth that “the king is now master here in all causes and over all persons.”

His own power was now at its height, and his position as the favourite of Charles, controlled by no considerations of patriotism or statesmanship, and completely independent of the English parliament, recalled the worst scandals and abuses of the Stuart administration before the Civil War. He was a member of the cabal ministry, but took little part in English affairs, and was not entrusted with the first secret treaty of Dover, but gave personal support to Charles in his degrading demands for pensions from Louis XIV. On the 2nd of May 1672 he was created duke of Lauderdale and earl of March, and on the 3rd of June knight of the garter. In 1673, on the resignation of James in consequence of the Test Act, he was appointed a commissioner for the admiralty. In October he visited Scotland to suppress the dissenters and obtain money for the Dutch War, and the intrigues organized by Shaftesbury against his power in his absence, and the attacks made upon him in the House of Commons in January 1674 and April 1675, were alike rendered futile by the steady support of Charles and James. On the 25th of June 1674 he was created earl of Guilford and Baron Petersham in the peerage of England. His ferocious measures having failed to suppress the conventicles in Scotland, he summoned to his aid in 1677 a band of Highlanders, who were sent into the western country. In consequence, a large party of Scottish nobles came to London, made common cause with the English country faction, and compelled Charles to order the disbandment of the marauders. In May 1678 another demand by the Commons for Lauderdale’s removal was thrown out by court influence by one vote. He maintained his triumphs almost to the end. In Scotland, which he visited immediately after this victory in parliament, he overbore all opposition to the king’s demands for money. Another address for his removal from the Commons in England was suppressed by the dissolution of parliament on the 26th of May 1679, and a renewed attack upon him, by the Scottish party and Shaftesbury’s faction combined, also failed. On the 22nd of June 1679 the last attempt of the unfortunate Covenanters was suppressed at Bothwell Brig. In 1680, however, failing health obliged Lauderdale to resign the place and power for which he had so long successfully struggled. His vote given for the execution of Lord Stafford on the 29th of November is said also to have incurred the displeasure of James. In 1682 he was stripped of all his offices, and he died in August. Lauderdale married (1) Lady Anne Home, daughter of the 1st earl of Home, by whom he had one daughter; and (2) Lady Elizabeth Murray, daughter of the 1st earl of Dysart and widow of Sir Lionel Tollemache. He left no male issue, consequently his dukedom and his English titles became extinct, but he was succeeded in the earldom by his brother Charles (see below).



See *Lauderdale Papers Add.* MSS. in Brit. Mus., 30 vols., a small selection of which, entitled *The Lauderdale Papers*, were edited by Osmond Airy for the Camden Society in 1884-1885; *Hamilton Papers* published by the same society; “Lauderdale Correspondence with Archbishop Sharp,” *Scottish Hist. Soc. Publications*, vol. 15 (1893); Burnet’s *Lives of the Hamiltons* and *History of his Own Time*; R. Baillie’s Letters; S. R. Gardiner’s *Hist. of the Civil War and of the Commonwealth*; Clarendon’s *Hist. of the Rebellion*; and the *Quarterly Review*, clvii. 407. Several speeches of Lauderdal are extant.

(P. C. Y.)

*Earls of Lauderdale.*

Charles Maitland, 3rd earl of Lauderdale (d. 1691), became an ordinary lord of session as Lord Halton in 1669, afterwards assisting his brother, the duke, in the management of public business in Scotland. His eldest son, Richard (1653-1695), became the 4th earl. As Lord Maitland he was lord-justice-general from 1681 to 1684; he was an adherent of James II. and after fighting at the battle of the Boyne he was an exile in France until his death. This earl made a verse translation of Virgil (published 1737). He left no sons, and his brother John (*c.*

1655-1710) became the 5th earl. John, a supporter of William III. and of the union of England and Scotland, was succeeded by his son Charles (*c.* 1688-1744), who was the grandfather of James, the 8th earl.

James Maitland, 8th earl of Lauderdale (1759-1839), was a member of parliament from 1780 until August 1789 when he succeeded his father in the earldom. In the House of Commons he took an active part in debate, and in the House of Lords, where he was a representative peer for Scotland, he was prominent as an opponent of the policy of Pitt and the English government with regard to France, a country he had visited in 1792. In 1806 he was made a peer of the United Kingdom as Baron Lauderdale of Thirlestane and for a short time he was keeper of the great seal of Scotland. By this time the earl, who had helped to found the Society of the Friends of the People in 1792, had somewhat modified his political views; this process was continued, and after acting as the leader of the Whigs in Scotland, Lauderdale became a Tory and voted against the Reform Bill of 1832. He died on the 13th of September 1839. He wrote an *Inquiry into the Nature and Origin of Public Wealth* (1804 and 1819), a work which has been translated into French and Italian and which produced a controversy between the author and Lord Brougham; *The Depreciation of the Paper-currency of Great Britain Proved* (1812); and other writings of a similar nature. He was succeeded by his sons James (1784-1860) and Anthony (1785-1863) as 9th and 10th earls. Anthony, a naval officer, died unmarried in March 1863, when his barony of the United Kingdom became extinct, but his Scottish earldom devolved upon a cousin, Thomas Maitland (1803-1878), a grandson of the 7th earl, who became 11th earl of Lauderdale. Thomas, who was an admiral of the fleet, died without sons, and the title passed to Charles Barclay-Maitland (1822-1884), a descendant of the 6th earl. When Charles died unmarried, another of the 6th earl's descendants, Frederick Henry Maitland (b. 1840), became 13th earl of Lauderdale.

The earls of Lauderdale are hereditary standard bearers for Scotland.

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1 *Pepys's Diary*, 2nd of March 1664.

LAUENBURG, a duchy of Germany, formerly belonging with Holstein to Denmark, but from 1865 to Prussia, and now included in the Prussian province of Schleswig-Holstein. It lies on the right bank of the Elbe, is bounded by the territories of Hamburg, Lübeck, Mecklenburg-Strelitz and the province of Hanover, and comprises an area of 453 sq. m. The surface is a slightly undulating plain. The soil, chiefly alluvial, though in some places arenaceous, is generally fertile and well cultivated, but a great portion is covered with forests, interspersed with lakes. By means of the Stecknitz canal, the Elbe, the principal river, is connected with the Trave. The chief agricultural products are timber, fruit, grain, hemp, flax and vegetables. Cattle-breeding affords employment for many of the inhabitants. The railroad from Hamburg to Berlin traverses the country. The capital is Ratzeburg, and there are two other towns, Mölln and Lauenburg.

The earliest inhabitants of Lauenburg were a Slav tribe, the Polabes, who were gradually replaced by colonists from Saxony. About the middle of the 12th century the country was subdued by the duke of Saxony, Henry the Lion, who founded a bishopric at Ratzeburg, and after Henry's fall in 1180 it formed part of the smaller duchy of Saxony, which was governed by Duke Bernhard. In 1203 it was conquered by Waldemar II., king of Denmark, but in 1227 it reverted to Albert, a son of its former duke. When Albert died in 1260 Saxony was divided. Lauenburg, or Saxe-Lauenburg, as it is generally called, became a separate duchy ruled by his son John, and had its own lines of dukes for over 400 years, one of them, Magnus I. (d. 1543), being responsible for the introduction of the reformed teaching into the land. The reigning family, however, became extinct when Duke Julius Francis died in September 1689, and there were at least eight claimants for his duchy, chief among them being John George III., elector of Saxony, and George William, duke of Brunswick-Lüneburg-Celle, the ancestors of both these princes having made treaties of mutual succession with former dukes of Saxe-Lauenburg. Both entered the country, but George William proved himself the stronger and occupied Ratzeburg; having paid a substantial sum of money to the elector, he was recognized by the inhabitants as their duke. When he died three years later Lauenburg passed to his nephew, George Louis, elector of Hanover, afterwards king of Great Britain as

George I., whose rights were recognized by the emperor Charles VI. in 1728. In 1803 the duchy was occupied by the French, and in 1810 it was incorporated with France. It reverted to Hanover after the battle of Leipzig in 1813, and in 1816 was ceded to Prussia, the greater part of it being at once transferred by her to Denmark in exchange for Swedish Pomerania. In 1848, when Prussia made war on Denmark, Lauenburg was occupied at her own request by some Hanoverian troops, and was then administered for three years under the authority of the German confederation, being restored to Denmark in 1851. Definitely incorporated with this country in 1853, it experienced another change of fortune after the short war of 1864 between Denmark on the one side and Prussia and Austria on the other, as by the peace of Vienna (30th of October 1864) it was ceded with Schleswig and Holstein to the two German powers. By the convention of Gastein (14th of August 1865) Austria surrendered her claim to Prussia in return for the payment of nearly £300,000 and in September 1865 King William I. took formal possession of the duchy. Lauenburg entered the North German confederation in 1866 and the new German empire in 1870. It retained its constitution and its special privileges until the 1st of July 1876, when it was incorporated with the kingdom of Prussia. In 1890 Prince Bismarck received the title of duke of Lauenburg.

See P. von Kobbe, *Geschichte und Landesbeschreibung des Herzogtums Lauenburg* (Altona, 1836-1837); Duve, *Mitteilungen zur Kunde der Staatsgeschichte Lauenburgs* (Ratzeburg, 1852-1857), and the *Archiv des Vereins für die Geschichte des Herzogtums Lauenburg* (Ratzeburg, 1884 seq.).

**LAUFF, JOSEF** (1855- ), German poet and dramatist, was born at Cologne on the 16th of November 1855, the son of a jurist. He was educated at Münster in Westphalia, and entering the army served as a lieutenant of artillery at Thorn and subsequently at Cologne, where he attained the rank of captain in 1890. In 1898 he was summoned by the German emperor, William II., to Wiesbaden, being at the same time promoted to major's rank, in order that he might devote his great dramatic talents to the royal theatre. His literary career began with the epic poems *Jan van Calker, ein Malerlied vom Niederrhein* (1887, 3rd ed., 1892) and *Der Helfensteiner, ein Sang aus dem Bauernkriege* (3rd ed., 1896). These were followed by *Die Overstolzin* (5th ed., 1900), *Herodias* (2nd ed., 1898) and the *Geislerin* (4th ed., 1902). He also wrote the novels *Die Hexe* (6th ed., 1900), *Regina coeli* (a story of the fall of the Dutch Republic) (7th ed., 1904), *Die Hauptmannsfrau* (8th ed., 1903) and *Marie Verwahnen* (1903). But he is best known as a dramatist. Beginning with the tragedy *Ignez de Castro* (1894), he proceeded to dramatize the great monarchs of his country, and, in a Hohenzollern tetralogy, issued *Der Burggraf* (1897, 6th ed. 1900) and *Der Eisenzahn* (1900), to be followed by *Der grosse Kurfürst* (The Great Elector) and *Friedrich der Grosse* (Frederick the Great).



See A. Schroeter, *Josef Lauff, Ein litterarisches Zeitbild* (1899), and B. Sturm, *Josef Lauff* (1903).

**LAUGHTER,** the visible and audible expression of mirth, pleasure or the sense of the ridiculous by movements of the facial muscles and inarticulate sounds (see Comedy, Play and Humour). The O. Eng. *hleahtor* is formed from *hleahhan*, to laugh, a common Teutonic word; cf. Ger. *lachen*, Goth. *hlahjan*, Icel. *hlaeja*, &c. These are in origin echoic or imitative words, to be referred to a Teut. base *hlah-*, Indo-Eur. *kark-*, to make a noise; Skeat (*Etym. Dict.*, 1898) connects ultimately Gr. κλώσσειν, to cluck like a hen, κράζειν, to croak, &c. A gentle and inaudible form of laughter expressed by a movement of the lips and by the eyes is a "smile." This is a comparatively late word in English, and is due to Scandinavian influence; cf. Swed. *smila*; it is ultimately connected with Lat. *mirari*, to wonder, and probably with Gr. μεῖδος.

LAUMONT, FRANÇOIS PIERRE NICHOLAS GILLET DE (1747-1834), French mineralogist, was born in Paris on the 28th of May 1747. He was educated at a military school, and served in the army from 1772-1784, when he was appointed inspector of mines. His attention in his leisure time was wholly given to mineralogy, and he assisted in organizing the new École des Mines in Paris. He was author of numerous mineralogical papers in the *Journal* and *Annales des Mines*. The mineral laumontite was named after him by Haüy. He died in Paris on the 1st of June 1834.

LAUNCESTON, a market town and municipal borough in the Launceston parliamentary division of Cornwall, England, 35½ m. N.W. of Plymouth, on branches of the Great Western and the London & South-Western railways. Pop. (1901) 4053. It lies in a hilly district by and above the river Kensey, an affluent of the Tamar, the houses standing picturesquely on the southern slope of the narrow valley, with the keep of the ancient castle crowning the summit. On the northern slope lies the parish of St Stephen. The castle, the ruins of which are in part of Norman date, was the seat of the earls of Cornwall, and was frequently besieged during the civil wars of the 17th century. In 1656 George Fox the Quaker was imprisoned in the north-east tower for disturbing the peace at St Ives by distributing tracts. Fragments of the old town walls and the south gateway, of the Decorated period, are standing. The church of St Mary Magdalen, built of granite, and richly ornamented without, was erected early in the 16th century, but possesses a detached tower dated 1380. A fine Norman doorway, now appearing as the entrance to a hotel, is preserved from an Augustinian priory founded in the reign of Henry I. The parish church of St Stephen is Early English, and later, with a Perpendicular tower. The trade of Launceston is chiefly agricultural, but there are tanneries and iron foundries. The borough is under a mayor, 4 aldermen and 12 councillors. Area, 2189 acres.

A silver penny of Æthelred II. witnesses to the fact that the privilege of coining money was exercised by Launceston (Dunheved, Lanscaveton, Lanstone) more than half a century before the Norman conquest. At the time of the Domesday survey the canons of St Stephen held Launceston, and the count of Mortain held Dunheved. The number of families settled on the former is not given, but attention is called to the market which had been removed thence by the count to the neighbouring castle of Dunheved, which had two mills, one villein and thirteen bordars. A spot more favoured by nature could not have been chosen either for settlement or for defence than the rich lands near the confluence of the Kensey and Tamar, out of which there rises abruptly the gigantic mound upon which the castle is built. It is not known when the canons settled here nor whether the count's castle, then newly erected, replaced some earlier fortification. Reginald, earl of Cornwall (1140-1175), granted to the canons rights of jurisdiction in all their lands and exemption from suit of court in the shire and hundred courts. Richard (1225-1272), king of the Romans, constituted Dunheved a free borough, and granted to the burgesses freedom from pontage, stallage and suillage, liberty to elect their own reeves, exemption from all pleas outside the borough except pleas of the crown, and a site for a gild-hall. The farm of the borough was fixed at 100s. payable to the earl, 65s. to the prior and 100s. 10d. to the lepers of St Leonard's. In 1205 the market which had been held on Sunday was changed to Thursday. An inquisition held in 1383 discloses two markets, a merchant gild, pillory and tumbrel. In 1555 Dunheved, otherwise Launceston, received a charter of incorporation, the common council to consist of a mayor, 8 aldermen and a recorder. By its provisions the borough was governed until 1835. The parliamentary franchise which had been conferred in 1294 was confined to the corporation and a number of free burgesses. In 1832 Launceston was shorn of one of its members, and in 1885 merged in the county. Separated from it by a small bridge over the Kensey lies the hamlet of Newport which, from 1547 until 1832, also returned two members. These were

swept away when the Reform Bill became law. Launceston was the assize town until Earl Richard, having built a palace at Restormel, removed the assize to Lostwithiel. In 1386 Launceston regained the privilege by royal charter. From 1715 until 1837, eleven years only excepted, the assize was held alternately here and at Bodmin. Since that time Bodmin has enjoyed the distinction. Launceston has never had a staple industry. The manufacture of serge was considerable early in the 19th century. Its market on Saturdays is well attended, and an ancient fair on the Feast of St Thomas is among those which survive.

See A. F. Robbins, *Launceston Past and Present*.

**LAUNCESTON,** the second city of Tasmania, in the county of Cornwall, on the river Tamar, 40 m. from the N. coast of the island, and 133 m. by rail N. by W. of Hobart. The city lies amid surroundings of great natural beauty in a valley enclosed by lofty hills. Cora Linn, about 6 m. distant, a deep gorge of the North Esk river, the Punch Bowl and Cataract Gorge, over which the South Esk falls in a magnificent cascade, joining the North Esk to form the Tamar, are spots famed throughout the Australian commonwealth for their romantic beauty. The city is the commercial capital of northern Tasmania, the river Tamar being navigable up to the town for vessels of 4000 tons. The larger ships lie in midstream and discharge into lighters, while vessels of 2000 tons can berth alongside the wharves on to which the railway runs. Launceston is a well-planned, pleasant town, lighted by electricity, with numerous parks and squares and many fine buildings. The post office, the custom house, the post office savings bank and the Launceston bank form an attractive group; the town hall is used exclusively for civic purposes, public meetings and social functions being held in an elegant building called the Albert hall. There are also a good art gallery, a theatre and a number of fine churches, one of which, the Anglican church of St John, dates from 1824. The city, which attained that rank in 1889, has two attractive suburbs, Invermay and Trevallyn; it has a racecourse at Mowbray 2 m. distant, and is the centre and port of an important fruit-growing district. Pop. of the city proper (1901) 18,022, of the city and suburbs 21,180.

**LAUNCH.** (1) A verb meaning originally to hurl, discharge a missile or other object, also to rush or shoot out suddenly or rapidly. It is particularly used of the setting afloat a vessel from the stocks on which she has been built. The word is an adaptation of O. Fr. *lancher*, *lancier*, to hurl, throw, Lat. *lanceare*, from *lancea*, a lance or spear. (2) The name of a particular type of boat, usually applied to one of the largest size of ships' boats, or to a large boat moved by electricity, steam or other power. The word is an adaptation of the Span. *lancha*, pinnace, which is usually connected with *lanchara*, the Portuguese name, common in 16th and 17th century histories, for a fast-moving small vessel. This word is of Malay origin and is derived from *lanchār*, quick, speedy.



**LAUNDRY,** a place or establishment where soiled linen, &c., is washed. The word is a contraction of an earlier form *lavendry*, from Lat. *lavanda*, things to be washed, *lavare*, to wash. "Launder," a similar contraction of *lavender*, was one (of either sex) who washes linen; from its use as a verb came the form "launderer," employed as both masculine and feminine in America, and the feminine form "laundress," which is also applied to a female

caretaker of chambers in the Inns of Court, London.

Laundry-work has become an important industry, organized on a scale which requires elaborate mechanical plant very different from the simple appliances that once sufficed for domestic needs. For the actual cleansing of the articles, instead of being rubbed by the hand or trodden by the foot of the washerwoman, or stirred and beaten with a “dolly” in the wash-tub, they are very commonly treated in rotary washing machines driven by power. These machines consist of an outer casing containing an inner horizontal cylindrical cage, in which the clothes are placed. By the rotation of this cage, which is reversed by automatic gearing every few turns, they are rubbed and tumbled on each other in the soap and water which is contained in the outer casing and enters the inner cylinder through perforations. The outer casing is provided with inlet valves for hot and cold water, and with discharge valves; and often also arrangements are made for the admission of steam under pressure, so that the contents can be boiled. Thus the operations of washing, boiling, rinsing and blueing (this last being the addition of a blue colouring matter to mask the yellow tint and thus give the linen the appearance of whiteness) can be performed without removing the articles from the machine. For drying, the old methods of wringing by hand, or by machines in which the clothes were squeezed between rollers of wood or india-rubber, have been largely superseded by “hydro-extractors” or “centrifugals.” In these the wet garments are placed in a perforated cage or basket, supported on vertical bearings, which is rotated at a high speed (1000 to 1500 times a minute) and in a short time as much as 85% of the moisture may thus be removed. The drying is often completed in an apartment through which dry air is forced by fans. In the process of finishing linen the old-fashioned laundress made use of the mangle, about the only piece of mechanism at her disposal. In the box-mangle the articles were pressed on a flat surface by rollers which were weighted with a box full of stones, moved to and fro by a rack and pinion. In a later and less cumbrous form of the machine they were passed between wooden rollers or “bowls” held close together by weighted levers. An important advance was marked by the introduction of machines which not only smooth and press the linen like the mangle, but also give it the glazed finish obtained by hot ironing. Machines of this kind are essentially the same as the calenders used in paper and textile manufacture. They are made in a great variety of forms, to enable them to deal with articles of different shapes, but they may be described generally as consisting either of a polished metal roller, heated by steam or gas, which works against a blanketted or felted surface in the form of another roller or a flat table, or, as in the Decoudun type, of a felted metal roller rotating against a heated concave bed of polished metal. In cases where hand-ironing is resorted to, time is economized by the employment of irons which are continuously heated by gas or electricity.

LA UNION, a seaport and the capital of the department of La Union, Salvador, 144 m. E.S.E. of San Salvador. Pop. (1905) about 4000. La Union is situated at the foot of a lofty volcano, variously known as Conchagua, Pinos and Meanguera, and on a broad indentation in the western shore of Fonseca Bay. Its harbour, the best in the republic, is secure in all weathers and affords good anchorage to large ships. La Union is the port of shipment for the exports of San Miguel and other centres of production in eastern Salvador.

LA UNION, a town of eastern Spain in the province of Murcia, 5 m. by rail E. of Cartagena and close to the Mediterranean Sea. Pop. (1900) 30,275, of whom little more than half inhabit the town itself. The rest are scattered among the numerous metal works and mines of iron, manganese, calamine, sulphur and lead, which are included within the municipal boundaries. La Union is quite a modern town, having sprung up in the second half of the 19th century. It has good modern municipal buildings, schools, hospital, town hall and

large factories.

LAURAHÜTTE, a village of Germany, in the Prussian province of Silesia, 5 m. S.E. of Beuthen, on the railway Tarnowitz-Emanuelsegen. It has an Evangelical and a Roman Catholic church, but is especially noteworthy for its huge iron works, which employ about 6000 hands. Pop. (1900) 13,571.

LAUREATE (Lat. *laureatus*, from *laurea*, the laurel tree). The laurel, in ancient Greece, was sacred to Apollo, and as such was used to form a crown or wreath of honour for poets and heroes; and this usage has been widespread. The word "laureate" or "laureated" thus came in English to signify eminent, or associated with glory, literary or military. "Laureate letters" in old times meant the despatches announcing a victory; and the epithet was given, even officially (*e.g.* to John Skelton) by universities, to distinguished poets. The name of "bacca-laureate" for the university degree of bachelor shows a confusion with a supposed etymology from Lat. *bacca lauri* (the laurel berry), which though incorrect (see BACHELOR) involves the same idea. From the more general use of the term "poet laureate" arose its restriction in England to the office of the poet attached to the royal household, first held by Ben Jonson, for whom the position was, in its essentials, created by Charles I. in 1617. (Jonson's appointment does not seem to have been formally made as poet-laureate, but his position was equivalent to that). The office was really a development of the practice of earlier times, when minstrels and versifiers were part of the retinue of the King; it is recorded that Richard Cœur de Lion had a *versificator regis* (Gulielmus Peregrinus), and Henry III. had a versificator (Master Henry); in the 15th century John Kay, also a "versifier," described himself as Edward IV.'s "humble poet laureate." Moreover, the crown had shown its patronage in various ways; Chaucer had been given a pension and a perquisite of wine by Edward III., and Spenser a pension by Queen Elizabeth. W. Hamilton classes Chaucer, Gower, Kay, Andrew Bernard, Skelton, Robert Whittington, Richard Edwards, Spenser and Samuel Daniel, as "volunteer Laureates." Sir William Davenant succeeded Jonson in 1638, and the title of poet laureate was conferred by letters patent on Dryden in 1670, two years after Davenant's death, coupled with a pension of £300 and a butt of Canary wine. The post then became a regular institution, though the emoluments varied, Dryden's successors being T. Shadwell (who originated annual birthday and New Year odes), Nahum Tate, Nicholas Rowe, Laurence Eusden, Colley Cibber, William Whitehead, Thomas Warton, H. J. Pye, Southey, Wordsworth, Tennyson and, four years after Tennyson's death, Alfred Austin. The office took on a new lustre from the personal distinction of Southey, Wordsworth and Tennyson; it had fallen into contempt before Southey, and on Tennyson's death there was a considerable feeling that no possible successor was acceptable (William Morris and Swinburne being hardly court poets). Eventually, however, the undesirability of breaking with tradition for temporary reasons, and thus severing the one official link between literature and the state, prevailed over the protests against following Tennyson by any one of inferior genius. It may be noted that abolition was similarly advocated when Warton and Wordsworth died.

The poet laureate, being a court official, was considered responsible for producing formal and appropriate verses on birthdays and state occasions; but his activity in this respect has varied, according to circumstances, and the custom ceased to be obligatory after Pye's death. Wordsworth stipulated, before accepting the honour, that no formal effusions from him should be considered a necessity; but Tennyson was generally happy in his numerous poems of this class. The emoluments of the post have varied; Ben Jonson first received a pension of 100 marks, and later an annual "terse of Canary wine." To Pye an allowance of £27 was made instead of the wine. Tennyson drew £72 a year from the lord chamberlain's

department, and £27 from the lord steward's in lieu of the "butt of sack."

See Walter Hamilton's *Poets Laureate of England* (1879), and his contributions to *Notes and Queries* (Feb. 4, 1893).

LAUREL. At least four shrubs or small trees are called by this name in Great Britain, viz. the common or cherry laurel (*Prunus Laurocerasus*), the Portugal laurel (*P. lusitanica*), the bay or sweet laurel (*Laurus nobilis*) and the spurge laurel (*Daphne Laureola*). The first two belong to the rose family (*Rosaceae*), to the section *Cerasus* (to which also belongs the cherry) of the genus *Prunus*.

The common laurel is a native of the woody and sub-alpine regions of the Caucasus, of the mountains of northern Persia, of north-western Asia Minor and of the Crimea. It was received into Europe in 1576, and flowered for the first time in 1583. Ray in 1688 relates that it was first brought from Trebizonde to Constantinople, thence to Italy, France, Germany and England. Parkinson in his *Paradisus* records it as growing in a garden at Highgate in 1629; and in Johnson's edition of Gerard's *Herbal* (1633) it is recorded that the plant "is now got into many of our choice English gardens, where it is well respected for the beauty of the leaues and their lasting or continuall greennesse" (see Loudon's *Arboretum*, ii. 717). The leaves of this plant are rather large, broadly lance-shaped and of a leathery consistence, the margin being somewhat serrated. They are remarkable for their poisonous properties, giving off the odour of bitter almonds when bruised; the vapour thus issuing is sufficient to kill small insects by the prussic acid which it contains. The leaves when cut up finely and distilled yield oil of bitter almonds and hydrocyanic (prussic) acid. Sweetmeats, custards, cream, &c., are often flavoured with laurel-leaf water, as it imparts the same flavour as bitter almonds; but it should be used sparingly, as it is a dangerous poison, having several times proved fatal. The first case occurred in 1731, which induced a careful investigation to be made of its nature; Schrader in 1802 discovered it to contain hydrocyanic acid. The effects of the distilled laurel-leaf water on living vegetables is to destroy them like ordinary prussic acid; while a few drops act on animals as a powerful poison. It was introduced into the British pharmacopoeia in 1839, but is generally superseded by the use of prussic acid. The *aqua laurocerasi*, or cherry laurel water, is now standardized to contain 0.1% of hydrocyanic acid. It must not be given in doses larger than 2 drachms. It contains benzole hydrate, which is antiseptic, and is therefore suitable for hypodermic injection; but the drug is of inconsistent strength, owing to the volatility of prussic acid.

The following varieties of the common laurel are in cultivation: the Caucasian (*Prunus Laurocerasus*, var. *caucasica*), which is hardier and bears very rich dark-green glossy foliage; the Versailles laurel (var. *latifolia*), which has larger leaves; the Colchican (var. *colchica*), which is a dwarf-spreading bush with narrow sharply serrated pale-green leaves. There is also the variety *rotundifolia* with short broad leaves, the Grecian with narrow leaves and the Alexandrian with very small leaves.

The Portugal laurel is a native of Portugal and Madeira. It was introduced into England about the year 1648, when it was cultivated in the Oxford Botanic Gardens. During the first half of the 18th century this plant, the common laurel and the holly were almost the only hardy evergreen shrubs procurable in British nurseries. They are all three tender about Paris, and consequently much less seen in the neighbourhood of that city than in England, where they stand the ordinary winters but not very severe ones. There is a variety (*myrtifolia*) of compact habit with smaller narrow leaves, also a variegated variety.

The evergreen glossy foliage of the common and Portugal laurels render them well adapted for shrubberies, while the racemes of white flowers are not devoid of beauty. The former often ripens its insipid drupes, but the Portugal rarely does so. It appears to be less able to accommodate itself to the English climate, as the wood does not usually "ripen" so satisfactorily. Hence it is rather more liable to be cut by the frost. It is grown in the open air in the southern United States.

The bay or sweet laurel (*Laurus nobilis*) belongs to the family Lauraceae, which contains sassafras, benzoin, camphor and other trees remarkable for their aromatic properties. It is a

large evergreen shrub, sometimes reaching the height of 60 ft., but rarely assuming a truly tree-like character. The leaves are smaller than those of the preceding laurels, possessing an aromatic and slightly bitter flavour, and are quite devoid of the poisonous properties of the cherry laurel. The small yellowish-green flowers are produced in axillary clusters, are male or female, and consist of a simple 4-leaved perianth which encloses nine stamens in the male, the anthers of which dehisce by valves which lift upwards as in the common barberry, and carry glandular processes at the base of the filament. The fruit consists of a succulent berry surrounded by the persistent base of the perianth. The bay laurel is a native of Italy, Greece and North Africa, and is abundantly grown in the British Isles as an evergreen shrub, as it stands most winters. The date of its introduction is unknown, but must have been previous to 1562, as it is mentioned in Turner's *Herbal* published in that year. A full description also occurs in Gerard's *Herball* (1597, p. 1222). It was used for strewing the floors of houses of distinguished persons in the reign of Elizabeth. Several varieties have been cultivated, differing in the character of their foliage, as the *undulata* or wave-leafed, *salicifolia* or willow-leafed, the variegated, the broad-leafed and the curled; there is also the double-flowered variety. The bay laurel was carried to North America by the early colonists.

This laurel is generally held to be the *Daphne* of the ancients, though Lindley, following Gerard (*Herball*, 1597, p. 761), asserted that the Greek *Daphne* was *Ruscus racemosus*. Among the Greeks the laurel was sacred to Apollo, especially in connexion with Tempe, in whose laurel groves the god himself obtained purification from the blood of the Python. This legend was dramatically represented at the Pythian festival once in eight years, a boy fleeing from Delphi to Tempe, and after a time being led back with song, crowned and adorned with laurel. Similar δαφνηφορίαι were known elsewhere in Greece. Apollo, himself purified, was the author of purification and atonement to other penitents, and the laurel was the symbol of this power, which came to be generally associated with his person and sanctuaries. The relation of Apollo to the laurel was expressed in the legend of Daphne (*q.v.*). The victors in the Pythian games were crowned with the laurels of Apollo, and thus the laurel became the symbol of triumph in Rome as well as in Greece. As Apollo was the god of poets, the *Laurea Apollinaris* naturally belonged to poetic merit (see LAUREATE). The various prerogatives of the laurel among the ancients are collected by Pliny (*Hist. Nat.* xv. 30). It was a sign of truce, like the olive branch; letters announcing victory and the arms of the victorious soldiery were garnished with it; it was thought that lightning could not strike it, and the emperor Tiberius always wore a laurel wreath during thunderstorms. From its association with the divine power of purification and protection, it was often set before the door of Greek houses, and among the Romans it was the guardian of the gates of the Caesars (Ovid, *Met.* i. 562 sq.). The laurel worn by Augustus and his successors had a miraculous history: the laurel grove at the imperial villa by the ninth milestone on the Flaminian way sprang from a shoot sent from heaven to Livia Drusilla (Sueton. *Galba*, i.). Like the olive, the laurel was forbidden to profane use. It was employed in divination; the crackling of its leaves in the sacred flame was a good omen (Tibull. ii. 5. 81), and their silence unlucky (Propert. ii. 21); and the leaves when chewed excited a prophetic afflatus (δαφνηφάγοι, cf. Tibull. ii. 5. 63). There is a poem enumerating the ancient virtues of the laurel by J. Passeratius (1594).



The last of the plants mentioned above under the name of laurel is the so-called spurge laurel (*Daphne Laureola*). This and one other species (*D. Mezereum*), the mezereon, are the sole representatives of the family Thymelaeaceae in Great Britain. The spurge laurel is a small evergreen shrub, with alternate somewhat lanceolate leaves with entire margins. The green flowers are produced in early spring, and form drooping clusters at the base of the leaves. The calyx is four-cleft, and carries eight stamens in two circles of four each within the tube. The pistil forms a berry, green at first, but finally black. The mezereon differs in blossoming before the leaves are produced, while the flowers are lilac instead of green. The bark furnishes the drug *Cortex Mezerei*, for which that of the spurge laurel is often substituted. Both are powerfully acrid, but the latter is less so than the bark of mezereon. It is now only used as an ingredient of the *liquor sarsae compositus concentratus*. Of other species in cultivation there are *D. Fortunei* from China, which has lilac flowers; *D. pontica*, a native of Asia Minor; *D. alpina*, from the Italian Alps; *D. collina*, south European; and *D. Cneorum*, the garland flower or trailing daphne, the handsomest of the hardy species.

See Hemsley's *Handbook of Hardy Trees*, &c.

LAURENS, HENRY (1724-1792), American statesman, was born in Charleston, South Carolina, on the 24th of February 1724, of Huguenot ancestry. When sixteen he became a clerk in a counting-house in London, and later engaged in commercial pursuits with great success at Charleston until 1771, when he retired from active business. He spent the next three years travelling in Europe and superintending the education of his sons in England. In spite of his strong attachment to England, and although he had defended the Stamp Act, in 1774, in the hope of averting war, he united with thirty-seven other Americans in a petition to parliament against the passing of the Boston Port Bill. Becoming convinced that a peaceful settlement was impracticable, he returned to Charleston at the close of 1774, and there allied himself with the conservative element of the Whig party. He was soon made president of the South Carolina council of safety, and in 1776 vice-president of the state; in the same year he was sent as a delegate from South Carolina to the general continental congress at Philadelphia, of which body he was president from November 1777 until December 1778. In August 1780 he started on a mission to negotiate on behalf of congress a loan of ten million dollars in Holland; but he was captured on the 3rd of September off the Banks of Newfoundland by the British frigate "Vestal," taken to London and closely imprisoned in the Tower. His papers were found to contain a sketch of a treaty between the United States and Holland projected by William Lee, in the service of Congress, and Jan de Neufville, acting on behalf of Mynheer Van Berckel, pensionary of Amsterdam, and this discovery eventually led to war between Great Britain and the United Provinces. During his imprisonment his health became greatly impaired. On the 31st of December 1781 he was released on parole, and he was finally exchanged for Cornwallis. In June 1782 he was appointed one of the American commissioners for negotiating peace with Great Britain, but he did not reach Paris until the 28th of November 1782, only two days before the preliminaries of peace were signed by himself, John Adams, Franklin and Jay. On the day of signing, however, he procured the insertion of a clause prohibiting the British from "carrying away any negroes or other property of American inhabitants"; and this subsequently led to considerable friction between the British and American governments. On account of failing health he did not remain for the signing of the definitive treaty, but returned to Charleston, where he died on the 8th of December 1792.

His son, JOHN LAURENS (1754-1782), American revolutionary officer, was born at Charleston, South Carolina, on the 28th of October 1754. He was educated in England, and on his return to America in 1777, in the height of the revolutionary struggle, he joined Washington's staff. He soon gained his commander's confidence, which he reciprocated with the most devoted attachment, and was entrusted with the delicate duties of a confidential secretary, which he performed with much tact and skill. He was present in all Washington's battles, from Brandywine to Yorktown, and his gallantry on every occasion has gained him the title of "the Bayard of the Revolution." Laurens displayed bravery even to rashness in the storming of the Chew mansion at Germantown; at Monmouth, where he saved Washington's life, and was himself severely wounded; and at Coosahatchie, where, with a handful of men, he defended a pass against a large English force under General Augustine Prevost, and was again wounded. He fought a duel against General Charles Lee, and wounded him, on account of that officer's disrespectful conduct towards Washington. Laurens distinguished himself further at Savannah, and at the siege of Charleston in 1780. After the capture of Charleston by the English, he rejoined Washington, and was selected by him as a special envoy to appeal to the king of France for supplies for the relief of the American armies, which had been brought by prolonged service and scanty pay to the verge of dissolution. The more active co-operation of the French fleets with the land forces in Virginia, which was one result of his mission, brought about the disaster of Cornwallis at Yorktown. Laurens lost no time in rejoining the army, and at Yorktown was at the head of an American storming party which captured an advanced redoubt. Laurens was designated with the vicomte de Noailles to arrange the terms of the surrender, which virtually ended the war, although desultory skirmishing, especially in the South, attended the months of delay before peace was formally concluded. In one of these trifling affairs on the 27th of August 1782, on the Combahee river, Laurens exposed himself needlessly and was killed. Washington lamented deeply the death of Laurens, saying of him, "He had not a fault that I could discover, unless it were intrepidity bordering upon rashness."

The most valuable of Henry Laurens's papers and pamphlets including the important "Narrative of the Capture of Henry Laurens, of his Confinement in the Tower of London, &c., 1780, 1781, 1782," in vol. i. (Charleston, 1857) of the Society's *Collections*, have been published by the South Carolina Historical Society. John Laurens's military correspondence,

with a brief memoir by W. G. Simms, was privately printed by the Bradford Club, New York, in 1867.

**LAURENT, FRANÇOIS** (1810-1887), Belgian historian and jurisconsult, was born at Luxemburg on the 8th of July 1810. He held a high appointment in the ministry of justice for some time before he became professor of civil law in the university of Ghent in 1836. His advocacy of liberal and anti-clerical principles both from his chair and in the press made him bitter enemies, but he retained his position until his death on the 11th of February 1887. He treated the relations of church and state in *L'Église et l'état* (Brussels, 3 vols., 1858-1862; new and revised edition, 1865), and the same subject occupied a large proportion of the eighteen volumes of his chief historical work, *Études sur l'histoire de l'humanité* (Ghent and Brussels, 1855-1870), which aroused considerable interest beyond the boundaries of Belgium. His fame as a lawyer rests on his authoritative exposition of the Code Napoléon in his *Principes de droit civil* (Brussels, 33 vols., 1869-1878), and his *Droit civil international* (Brussels, 8 vols., 1880-1881). He was charged in 1879 by the minister of justice with the preparation of a report on the proposed revision of the civil code. Besides his anti-clerical pamphlets his minor writings include much discussion of social questions, of the organization of savings banks, asylums, &c., and he founded the *Société Callier* for the encouragement of thrift among the working classes. With Gustave Callier, whose funeral in 1863 was made the occasion of a display of clerical intolerance, Laurent had much in common, and the efforts of the society were directed to the continuation of Callier's philanthropic schemes.

For a complete list of his works, see G. Koninck, *Bibliographie nationale* (Brussels, vol. ii., 1892).

**LAURENTINA, VIA,** an ancient road of Italy, leading southwards from Rome. The  question of the nomenclature of the group of roads between the Via Ardeatina and the Via Ostiensis is somewhat difficult, and much depends on the view taken as to the site of Laurentum. It seems probable, however, that the Via Laurentina proper is that which led out of the Porta Ardeatina of the Aurelian wall and went direct to Tor Paterno, while the road branching from the Via Ostiensis at the third mile, and leading past Decimo to Lavinium (Pratica), which crosses the other road at right angles not far from its destination (the Laurentina there running S.W. and that to Lavinium S.E.) may for convenience be called Lavinatis, though this name does not occur in ancient times. On this latter road, beyond Decimo, two milestones, one of Tiberius, the other of Maxentius, each bearing the number 11, have been found; and farther on, at Capocotta, traces of ancient buildings, and an important sepulchral inscription of a Jewish ruler of a synagogue have come to light. That the Via Laurentina was near the Via Ardeatina is clear from the fact that the same contractor was responsible for both roads. Laurentum was also accessible by a branch from the Via Ostiensis at the eighth mile (at Malafede) leading past Castel Porziano, the royal hunting-lodge, which is identical with the ancient Ager Solonius (in which, Festus tells us, was situated the Pomonal or sacred grove of Pomona) and which later belonged to Marius.

See R. Lanciani in articles quoted under LAVINIUM.

(T. As.)

**LAURENTIUS, PAUL** (1554-1624), Lutheran divine, was born on the 30th of March 1554 at Ober Wierau, where his father, of the same names, was pastor. From a school at Zwickau he entered (1573) the university of Leipzig, graduating in 1577. In 1578 he became rector of the Martin school at Halberstadt; in 1583 he was appointed town's preacher at Plauen-im-Vogtland, and in 1586 superintendent at Oelnitz. On the 20th of October 1595 he took his doctorate in theology at Jena, his thesis on the *Symbolum Athanasii* (1597), gaining him similar honours at Wittenberg and Leipzig. He was promoted (1605) to be pastor and superintendent at Dresden, and transferred (1616) to the superintendence at Meissen, where he died on the 24th of February 1624. His works consist chiefly of commentaries and expository discourses on prophetic books of the Old Testament, parts of the Psalter, the Lord's Prayer and the history of the Passion. In two orations he compared Luther to Elijah. Besides theological works he was the author of a *Spicilegium Gnomonologicum* (1612).

The main authority is C. Schlegel, the historian of the Dresden superintendents (1698), summarized by H. W. Rotermund, in the additions (1810) to Jöcher, *Gelehrten-Lexicon* (1750).

(A. Go.*)

**LAURIA** (Luria or Loria) **ROGER DE** (d. 1305), admiral of Aragon and Sicily, was the most prominent figure in the naval war which arose directly from the Sicilian Vespers. Nothing is really known of his life before he was named admiral in 1283. His father was a supporter of the Hohenstaufen, and his mother came to Spain with Costanza, the daughter of Manfred of Beneventum, when she married Peter, the eldest son and heir of James the Conqueror of Aragon. According to one account Bella of Lauria, the admiral's mother, had been the foster mother of Costanza. Roger, who accompanied his mother, was bred at the court of Aragon and endowed with lands in the newly conquered kingdom of Valencia. When the misrule of Charles of Anjou's French followers had produced the famous revolt known as the Sicilian Vespers in 1282, Roger de Lauria accompanied King Peter III. of Aragon on the expedition which under the cover of an attack on the Moorish kingdom of Tunis was designed to be an attempt to obtain possession of all or at least part of the Hohenstaufen dominions in Naples and Sicily which the king claimed by right of his wife as the heiress of Manfred. In 1283, when the island had put itself under the protection of Peter III. and had crowned him king, he gave the command of his fleet to Roger de Lauria. The commission speaks of him in the most laudatory terms, but makes no reference to previous military services.

From this time forward till the peace of Calatabellota in 1303, Roger de Lauria was the ever victorious leader of fleets in the service of Aragon, both in the waters of southern Italy and on the coast of Catalonia. In the year of his appointment he defeated a French naval force in the service of Charles of Anjou, off Malta. The main object before him was to repel the efforts of the Angevine party to reconquer Sicily and then to carry the war into their dominions in Naples. Although Roger de Lauria did incidental fighting on shore, he was as much a naval officer as any modern admiral, and his victories were won by good manœuvring and by discipline. The Catalan squadron, on which the Sicilian was moulded, was in a state of high and intelligent efficiency. Its chiefs relied not on merely boarding, and the use of the sword, as the French forces of Charles of Anjou did, but on the use of the ram, and of the powerful cross-bows used by the Catalans either by hand or, in case of the larger ones, mounted on the bulwarks, with great skill. The conflict was in fact the equivalent on the water of the battles between the English bowmen and the disorderly chivalry of France in the Hundred Years' War. In 1284 Roger defeated the Angevine fleet in the Bay of Naples, taking prisoner the heir to the kingdom, Charles of Salerno, who remained a prisoner in the hands of the Aragonese in Sicily, and later in Spain, for years. In 1285 he fought on the coast of Catalonia one of the most brilliant campaigns in all naval history. The French king Philippe le Hardi had invaded Catalonia with a large army to which the pope gave the character of crusaders, in order to support his cousin of Anjou in his conflict with the Aragonese. The king, Peter III., had offended his nobles by his vigorous exercise of the royal authority, and received little support from them, but the outrages perpetrated by the French invaders raised the towns and country against them. The invaders advanced slowly, taking the obstinately defended towns one by one, and relying on the co-operation of a large

number of allies, who were stationed in squadrons along the coast, and who brought stores and provisions from Narbonne and Aigues Mortes. They relied in fact wholly on their fleet for their existence. A successful blow struck at that would force them to retreat. King Peter was compelled to risk Sicily for a time, and he recalled Roger de Lauria from Palermo to the coast of Catalonia. The admiral reached Barcelona on the 24th of August, and was informed of the disposition of the French. He saw that if he could break the centre of their line of squadrons, stretched as it was so far that its general superiority of numbers was lost in the attempt to occupy the whole of the coast, he could then dispose of the extremities in detail. On the night of the 9th of September he fell on the central squadron of the French fleet near the Hormigas. The Catalan and Sicilian squadrons doubled on the end of the enemies' line, and by a vigorous employment of the ram, as well as by the destructive shower of bolts from the cross-bows, which cleared the decks of the French, gained a complete victory. The defeat of the enemy was followed, as usually in medieval naval wars, by a wholesale massacre. Roger then made for Rosas, and tempted out the French squadron stationed there by approaching under French colours. In the open it was beaten in its turn. The result was the capture of the town, and of the stores collected there by King Philippe for the support of his army. Within a short time he was forced to retreat amid sufferings from hunger, and the incessant attacks of the Catalan mountaineers, by which his army was nearly annihilated. This campaign, which was followed up by destructive attacks on the French coast, saved Catalonia from the invaders, and completely ruined the French naval power for the time being. No medieval admiral of any nation displayed an equal combination of intellect and energy, and none of modern times has surpassed it. The work had been so effectually done on the coast of Catalonia that Roger de Lauria was able to return to Sicily, and resume his command in the struggle of Aragonese and Angevine to gain, or to hold, the possession of Naples.

He maintained his reputation and was uniformly successful in his battles at sea, but they were not always fought for the defence of Sicily. The death of Peter III. in 1286 and of his  eldest son Alphonso in the following year caused a division among the members of the house of Aragon. The new king, James, would have given up Sicily to the Angevine line with which he made peace and alliance, but his younger brother Fadrique accepted the crown offered him by the Sicilians, and fought for his own hand against both the Angevines and his senior. King James tried to force him to submission without success. Roger de Lauria adhered for a time to Fadrique, but his arrogant temper made him an intolerable supporter, and he appears, moreover, to have thought that he was bound to obey the king of Aragon. His large estates in Valencia gave him a strong reason for not offending that sovereign. He therefore left Fadrique, who confiscated his estates in Sicily and put one of his nephews to death as a traitor. For this Roger de Lauria took a ferocious revenge in two successive victories at sea over the Sicilians. When the war, which had become a ravening of wild beasts, was at last ended by the peace of Calatabellota, Roger de Lauria retired to Valencia, where he died on the 2nd of January 1305, and was buried, by his express orders, in the church of Santas Creus, a now deserted monastery of the Cistercians, at the feet of his old master Peter III. In his ferocity, and his combination of loyalty to his feudal lord with utter want of scruple to all other men, Roger belonged to his age. As a captain he was far above his contemporaries and his successors for many generations.

Signor Amari's *Guerra del Vespro Siciliano* gives a general picture of these wars, but the portrait of Roger de Lauria must be sought in the *Chronicle* of the Catalan Ramon de Muntaner who knew him and was formed in his school. There is a very fair and well "documented" account of the masterly campaign of 1285 in Charles de la Roncière's *Histoire de la marine française*, i. 189-217.

(D. H.)

LAURIA, or Loria, a city of Basilicata, Italy, in the province of Potenza, situated near the borders of Calabria, 7½ m. by road S. of Lagonegro. Pop. (1901) 10,470. It is a walled town on the steep side of a hill with another portion in the plain below, 1821 ft. above sea-level. The castle was the birthplace of Ruggiero di Loria, the great Italian admiral of the 13th century. It was destroyed by the French under Masséna in 1806.

LAURIER, SIR WILFRID (1841- ), Canadian statesman, was born on the 20th of November 1841, at St Lin in the province of Quebec. The child of French Roman Catholic parents, he attended the elementary school of his native parish and for eight or nine months was a pupil of the Protestant elementary school at New Glasgow in order to learn English; his association with the Presbyterian family with whom he lived during this period had a permanent influence on his mind. At twelve years of age he entered L'Assomption college, and was there for seven years. The college, like all the secondary schools in Quebec then available for Roman Catholics, was under direct ecclesiastical control. On leaving it he entered a law office at Montreal and took the law course at McGill University. At graduation he delivered the valedictory address for his class. This, like so many of his later utterances, closed with an appeal for sympathy and union between the French and English races as the secret of the future of Canada. He began to practise law in Montreal, but owing to ill-health soon removed to Athabaska, where he opened a law office and undertook also to edit *Le Défricheur*, a newspaper then on the eve of collapse. At Athabaska, the seat of one of the superior courts of Quebec, the population of the district was fairly divided between French- and English-speaking people, and Laurier's career was undoubtedly influenced by his constant association with English-speaking people and his intimate acquaintance with their views and aspirations.

While at Montreal he had joined the Institut Canadien, a literary and scientific society which, owing to its liberal discussions and the fact that certain books upon its shelves were on the *Index expurgatorius*, was finally condemned by the Roman Catholic authorities. *Le Défricheur* was an organ of extreme French sentiment, opposed to confederation, and also under ecclesiastical censure. One of its few surviving copies contains an article by Laurier opposing confederation as a scheme designed in the interest of the English colonies in North America, and certain to prove the tomb of the French race and the ruin of Lower Canada. The Liberals of Quebec under the leadership of Sir Antoine Dorion were hostile to confederation, or at least to the terms of union agreed upon at the Quebec conference, and Laurier in editorials and speeches maintained the position of Dorion and his allies. He was elected to the Quebec legislature in 1871, and his first speech in the provincial assembly excited great interest, on account of its literary qualities and the attractive manner and logical method of the speaker. He was not less successful in the Dominion House of Commons, to which he was elected in 1874. During his first two years in the federal parliament his chief speeches were made in defence of Riel and the French halfbreeds who were concerned in the Red River rebellion, and on fiscal questions. Sir John Macdonald, then in opposition, had committed his party to a protectionist policy, and Laurier, notwithstanding that the Liberal party stood for a low tariff, avowed himself to be "a moderate protectionist." He declared that if he were in Great Britain he would be a free trader, but that free trade or protection must be applied according to the necessities of a country, and that which protection necessarily involved taxation it was the price a young and vigorous nation must pay for its development. But the Liberal government, to which Laurier was admitted as minister of inland revenue in 1877, made only a slight increase in duties, raising the general tariff from 15% to 17½%; and against the political judgment of Alexander Mackenzie, Sir Richard Cartwright, George Brown, Laurier and other of the more influential leaders of the party, it adhered to a low tariff platform. In the bye-election which followed Laurier's admission to the cabinet he was defeated—the only personal defeat he ever sustained; but a few weeks later he was returned for Quebec East, a constituency which he held thenceforth by enormous majorities. In 1878 his party went out of office and Sir John Macdonald entered upon a long term of power, with protection as the chief feature of his policy, to which was afterwards added the construction of the Canadian Pacific railway.

After the defeat of the Mackenzie government, Laurier sat in Parliament as the leader of the Quebec Liberals and first lieutenant to the Hon. Edward Blake, who succeeded Mackenzie in the leadership of the party. He was associated with Blake in his sustained opposition to high tariff, and to the Conservative plan for the construction of the Canadian Pacific railway, and was a conspicuous figure in the long struggle between Sir John Macdonald and the leaders of the Liberal party to settle the territorial limits of the province of Ontario and the legislative rights of the provinces under the constitution. He was forced

also to maintain a long conflict with the ultramontane element of the Roman Catholic church in Quebec, which for many years had a close working alliance with the Conservative politicians of the province and even employed spiritual coercion in order to detach votes from the Liberal party. Notwithstanding that Quebec was almost solidly Roman Catholic the Rouges sternly resisted clerical pressure; they appealed to the courts and had certain elections voided on the ground of undue clerical influence, and at length persuaded the pope to send out a delegate to Canada, through whose inquiry into the circumstances the abuses were checked and the zeal of the ultramontanes restrained.

In 1887, upon the resignation of Blake on the ground of ill-health, Laurier became leader of the Liberal party, although he and many of the more influential men in the party doubted the wisdom of the proceeding. He was the first French Canadian to lead a federal party in Canada since confederation. Apart from the natural fear that he would arouse prejudice in the English-speaking provinces, the second Riel rebellion was then still fresh in the public mind, and the fierce nationalist agitation which Riel’s execution had excited in Quebec had hardly subsided. Laurier could hardly have come to the leadership at a more inopportune moment, and probably he would not have accepted the office at all if he had not believed that Blake could be persuaded to resume the leadership when his health was restored. But from the first he won great popularity even in the English-speaking provinces, and showed unusual capacity for leadership. His party was beaten in the first general election held after he became leader (1891), but even with its policy of unrestricted reciprocity with the United States, and with Sir John Macdonald still at the head of the Conservative party, it was beaten by only a small majority. Five years later, with unrestricted reciprocity relegated to the background, and with a platform which demanded tariff revision so adjusted as not to endanger established interests, and which opposed the federal measure designed to restore in Manitoba the separate or Roman Catholic schools which the provincial government had abolished, Laurier carried the country, and in July 1896 he was called by Lord Aberdeen, then governor-general, to form a government.



He was the first French-Canadian to occupy the office of premier; and his personal supremacy was shown by his long continuance in power. During the years from 1896 to 1910, he came to hold a position within the British Empire which was in its way unique, and in this period he had seen Canadian prosperity advance progressively by leaps and bounds. The chief features of his administration were the fiscal preference of 33⅓% in favour of goods imported into Canada from Great Britain, the despatch of Canadian contingents to South Africa during the Boer war, the contract with the Grand Trunk railway for the construction of a second transcontinental road from ocean to ocean, the assumption by Canada of the imperial fortresses at Halifax and Esquimault, the appointment of a federal railway commission with power to regulate freight charges, express rates and telephone rates, and the relations between competing companies, the reduction of the postal rate to Great Britain from 5 cents to 2 cents and of the domestic rate from 3 cents to 2 cents, a substantial contribution to the Pacific cable, a practical and courageous policy of settlement and development in the Western territories, the division of the North-West territories into the provinces of Alberta and Saskatchewan and the enactment of the legislation necessary to give them provincial status, and finally (1910), a tariff arrangement with the United States, which, if not all that Canada might claim in the way of reciprocity, showed how entirely the course of events had changed the balance of commercial interests in North America.

Laurier made his first visit to Great Britain on the occasion of Queen Victoria’s diamond jubilee (1897), when he received the grand cross of the Bath; he then secured the denunciation of the Belgian and German treaties and thus obtained for the colonies the right to make preferential trade arrangements with the mother country. His personality made a powerful impression in Great Britain and also in France, which he visited before his return to Canada. His strong facial resemblance both to Lord Beaconsfield and to Sir John Macdonald marked him out in the public eye, and he captured attention by his charm of manner, fine command of scholarly English and genuine eloquence. Some of his speeches in Great Britain, coming as they did from a French-Canadian, and revealing delicate appreciation of British sentiment and thorough comprehension of the genius of British institutions, excited great interest and enthusiasm, while one or two impassioned speeches in the Canadian parliament during the Boer war profoundly influenced opinion in Canada and had a pronounced effect throughout the empire.

A skilful party-leader, Laurier kept from the first not only the affection of his political friends but the respect of his opponents; while enforcing the orderly conduct of public business, he was careful as first minister to maintain the dignity of parliament. In office he

proved more of an opportunist than his career in opposition would have indicated, but his political courage and personal integrity remained beyond suspicion. His jealousy for the political autonomy of Canada was noticeable in his attitude at the Colonial conference held at the time of King Edward's coronation, and marked all his diplomatic dealings with the mother country. But he strove for sympathetic relations between Canadian and imperial authorities, and favoured general legislative and fiscal co-operation between the two countries. He strove also for good relations between the two races in Canada, and between Canada and the United States. Although he was classed in Canada as a Liberal, his tendencies would in England have been considered strongly conservative; an individualist rather than a collectivist, he opposed the intrusion of the state into the sphere of private enterprise, and showed no sympathy with the movement for state operation of railways, telegraphs and telephones, or with any kindred proposal looking to the extension of the obligations of the central government.

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(J. S. W.)

## LAURISTON, JACQUES ALEXANDRE BERNARD LAW, MARQUIS DE

(1768-1828), French soldier and diplomatist, was the son of Jacques François Law de Lauriston (1724-1785), a general officer in the French army, and was born at Pondicherry on the 1st of February 1768. He obtained his first commission about 1786, served with the artillery and on the staff in the earlier Revolutionary campaigns, and became brigadier of artillery in 1795. Resigning in 1796, he was brought back into the service in 1800 as aide-de-camp to Napoleon, with whom as a cadet Lauriston had been on friendly terms. In the years immediately preceding the first empire Lauriston was successively director of the Le Fère artillery school and special envoy to Denmark, and he was selected to convey to England the ratification of the peace of Amiens (1802). In 1805, having risen to the rank of general of division, he took part in the war against Austria. He occupied Venice and Ragusa in 1806, was made governor-general of Venice in 1807, took part in the Erfurt negotiations of 1808, was made a count, served with the emperor in Spain in 1808-1809 and held commands under the viceroy Eugène Beauharnais in the Italian campaign and the advance to Vienna in the same year. At the battle of Wagram he commanded the guard artillery in the famous "artillery preparation" which decided the battle. In 1811 he was made ambassador to Russia; in 1812 he held a command in the *Grande Armée* and won distinction by his firmness in covering the retreat from Moscow. He commanded the V. army corps at Lützen and Bautzen and the V. and XI. in the autumn campaign, falling into the hands of the enemy in the disastrous retreat from Leipzig. He was held a prisoner of war until the fall of the empire, and then joined Louis XVIII., to whom he remained faithful in the Hundred Days. His reward was a seat in the house of peers and a command in the royal guard. In 1817 he was created marquis and in 1823 marshal of France. During the Spanish War he commanded the corps which besieged and took Pamplona. He died at Paris on the 12th of June 1828.

## LAURIUM

(Λαύριον, mod. ERGASTIRI), a mining town in Attica, Greece, famous for the silver mines which were one of the chief sources of revenue of the Athenian state, and were employed for coinage. After the battle of Marathon, Themistocles persuaded the Athenians to devote the revenue derived from the mines to shipbuilding, and thus laid the foundation of the Athenian naval power, and made possible the victory of Salamis. The mines, which were the property of the state, were usually farmed out for a certain fixed sum and a

percentage on the working; slave labour was exclusively employed. Towards the end of the 5th century the output was diminished, partly owing to the Spartan occupation of Decelea. But the mines continued to be worked, though Strabo records that in his time the tailings were being worked over, and Pausanias speaks of the mines as a thing of the past. The ancient workings, consisting of shafts and galleries for excavating the ore, and pans and other arrangements for extracting the metal, may still be seen. The mines are still worked at the present day by French and Greek companies, but mainly for lead, manganese and cadmium. The population of the modern town was 10,007 in 1907.

See E. Ardaillon, "Les Mines du Laurion dans l'antiquité," No. lxxvii. of the *Bibliothèque des écoles françaises d'Athènes et de Rome*.

**LAURIUM,** a village of Houghton county, Michigan, U.S.A., near the centre of Keweenaw peninsula, the northern extremity of the state. Pop. (1890) 1159; (1900) 5643, of whom 2286 were foreign-born; (1904) 7653; (1910) 8537. It is served by the Mineral Range and the Mohawk and Copper Range railways. It is in one of the most productive copper districts in the United States, and copper mining is its chief industry. Immediately W. of Laurium is the famous Calumet and Hecla mine. The village was formerly named Calumet, and was incorporated under that name in 1889, but in 1895 its name was changed by the legislature to Laurium, in allusion to the mineral wealth of Laurium in Greece. The name Calumet is now applied to the post office in the village of Red Jacket (incorporated 1875; pop. 1900, 4668; 1904, 3784; 1910, 4211), W. of the Calumet and Hecla mine; and Laurium, the mining property and Red Jacket are all in the township of Calumet (pop. 1904, state census, 28,587).



**LAURUSTINUS,** in botany, the popular name of a common hardy evergreen garden shrub known botanically as *Viburnum Tinus*, with rather dark-green ovate leaves in pairs and flat-topped clusters (or corymbs) of white flowers, which are rose-coloured before expansion, and appear very early in the year. It is a native of the Mediterranean region, and was in cultivation in Britain at the end of the 16th century. *Viburnum* belongs to the natural order Caprifoliaceae and includes the common wayfaring tree (*V. Lantana*) and the guelder rose (*V. Opulus*).

**LAURVIK,** Larvik or Laurvig, a seaport of Norway, in Jarlsberg and Laurvik *amt* (county), at the head of a short fjord near the mouth of the Laagen river, 98 m. S.S.W. of Christiania by the Skien railway. Pop. (1900) 10,664. It has various industries, including saw and planing mills, shipbuilding, glassworks and factories for wood-pulp, barrels and potato flour; and an active trade in exporting timber, ice, wood-pulp and granite, chiefly to Great Britain, and in importing from the same country coal and salt. The port has a depth of 18 to 24 ft. beside the quays. Four miles south is Fredriksvaern, formerly a station of the Norwegian fleet and the seat of a naval academy. Laurviks Bad is a favourite spa, with mineral and sulphur springs and mud-baths.

LAUSANNE, the capital of the Swiss canton of Vaud. It is the junction of the railway lines from Geneva, from Brieg and the Simplon, from Fribourg and Bern, and from Vallorbe (for Paris). A funicular railway connects the upper town with the central railway station and with Ouchy, the port of Lausanne on the lake of Geneva. Lausanne takes its name from the Flon stream flowing through it, which was formerly called Laus (water). The older or upper portion of the town is built on the crest and slopes of five hillocks and in the hollows between them, all forming part of the Jorat range. It has a picturesque appearance from the surface of the lake, above which the cathedral rises some 500 ft., while from the town there is a fine view across the lake towards the mountains of Savoy and of the Valais. The quaint characteristics of the hilly site of the old town have largely been destroyed by modern improvements, which began in 1836 and were not quite completed in 1910. The Grand Pont, designed by the cantonal engineer, Adrien Pichard (1790-1841), was built 1839-1844, while the Barre tunnel was pierced 1851-1855 and the bridge of Chauderon was built in 1905. The valleys and lower portions of the town were gradually filled up so as to form a series of squares, of which those of Riponne and of St François are the finest, the latter now being the real centre of the town. The railways were built between 1856 and 1862, while the opening of the Simplon tunnel (1906) greatly increased the commercial importance of Lausanne, which is now on the great international highway from Paris to Milan. From 1896 onwards a well-planned set of tramways within the town was constructed. The town is still rapidly extending, especially towards the south and west. Since the days of Gibbon (resident here for three periods, 1753-1758, 1763-1764 and 1783-1793), whose praises of the town have been often repeated, Lausanne has become a favourite place of residence for foreigners (including many English), who are especially attracted by the excellent establishments for secondary and higher education. Hence in 1900 there were 9501 foreign residents (of whom 628 were British subjects) out of a total population of 46,732 inhabitants; in 1905 it was reckoned that these numbers had risen respectively to 10,625, 818 and 53,577. In 1709 it is said that the inhabitants numbered but 7432 and 9965 in 1803, while the numbers were 20,515 in 1860 and 33,340 in 1888. Of the population in 1900 the great majority was French-speaking (only 6627 German-speaking and 3146 Italian-speaking) and Protestant (9364 Romanists and 473 Jews).

The principal building is the cathedral church (now Protestant) of Notre Dame, which with the castle occupies the highest position. It is the finest medieval ecclesiastical building in Switzerland. Earlier buildings were more or less completely destroyed by fire, but the present edifice was consecrated in 1275 by Pope Gregory X. in the presence of the emperor Rudolf of Habsburg. It was sacked after the Bernese conquest (1536) and the introduction of Protestantism, but many ancient tapestries and other precious objects are still preserved in the Historical Museum at Bern. The church was well restored at great cost from 1873 onwards, as it is the great pride of the citizens. Close by is the castle, built in the early 15th century by the bishops, later the residence of the Bernese bailiffs and now the seat of the various branches of the administration of the canton of Vaud. Near both is the splendid Palais de Rumine (on the Place de la Riponne), opened in 1906 and now housing the university as well as the cantonal library, the cantonal picture gallery (or Musée Arlaud, founded 1841) and the cantonal collections of archaeology, natural history, &c. The university was raised to that rank in 1890, but, as an academy, dates from 1537. Among its former teachers may be mentioned Theodore Beza, Conrad Gesner, J. P. de Crousaz, Charles Monnard, Alexandre Vinet, Eugène Rambert, Juste Olivier and several members of the Secretan family. On the Montbenon heights to the south-west of the cathedral group is the federal palace of justice, the seat (since 1886) of the federal court of justice, which, erected by the federal constitution of 29th May 1874, was fixed at Lausanne by a federal resolution of 26th June 1874. The house, La Grotte, which Gibbon inhabited 1783-1793, and on the terrace of which he completed (1787) his famous history, was demolished in 1896 to make room for the new post office that stands on the Place St François. The asylum for the blind was mainly founded (1845) by the generosity of W. Haldimand, an Englishman of Swiss descent. The first book printed in Lausanne was the missal of the cathedral church (1493), while the *Gazette de Lausanne* (founded 1798) took that name in 1804. Lausanne has been the birthplace of many distinguished men, such as Benjamin Constant, the Secretans, Vinet

and Rambert. It is the seat of many benevolent, scientific and literary societies and establishments.

The original town (mentioned in the Antonine Itinerary) was on the shore of the lake, near Vidy, south-west of the present city. It was burnt in the 4th century by the Alamanni. Some of the inhabitants took refuge in the hills above and there founded a new town, which acquired more importance when Bishop Marius about 590 chose it as his see city (perhaps transferring it from Avenches). Here rose the cathedral church, the bishop's palace, &c. Across the Flon was a Burgundian settlement, later known as the Bourg, while to the west was a third colony around the church of St Laurent. These three elements joined together to form the present city. The bishops obtained little by little great temporal powers (the diocese extended to the left bank of the Aar) and riches, becoming in 1125 princes of the empire, while their chapter was recruited only from the noblest families. But in 1368 the bishop was forced to recognize various liberties and customs that had been gradually won by the citizens, the *Plaid Général* of that year showing that there was already some kind of municipal government, save for the *cité*, which was not united with the *ville inférieure* or the other four *quartiers* (Bourg, St Laurent, La Palud and Le Pont) in 1481. In 1525 the city made an alliance with Bern and Fribourg. But in 1536 the territory of the bishop (as well as the Savoyard barony of Vaud) was forcibly conquered by the Bernese, who at once introduced Protestantism. The Bernese occupation lasted till 1798, though in 1723 an attempt was made to put an end to it by Major Davel, who lost his life in consequence. In 1798 Lausanne became a simple prefecture of the canton Léman of the Helvetic republic.  But in 1803, on the creation of the canton of Vaud by the Act of Mediation, it became its capital. The bishop of Lausanne resided after 1663 at Fribourg, while from 1821 onwards he added "and of Geneva" to his title.

Besides the general works dealing with the canton of Vaud (*q.v.*), the following books refer specially to Lausanne: A. Bernus, *L'Imprimerie à Lausanne et à Morges jusqu'à la fin du 16ième siècle* (Lausanne, 1904); M. Besson, *Récherches sur les origines des évêchés de Genève, Lausanne, Sion* (Fribourg, 1906); A. Bonnard, "Lausanne au 18ième siècle," in the work entitled *Chez nos aïeux* (Lausanne, 1902); E. Dupraz, *La Cathédrale de Lausanne ... étude historique* (Lausanne, 1906); E. Gibbon, *Autobiography and Letters* (3 vols., 1896); F. Gingins and F. Forel, *Documents concernant l'ancien évêché de Lausanne*, 2 parts (Lausanne, 1846-1847); J. H. Lewis and F. Gribble, *Lausanne* (1909); E. van Muyden and others, *Lausanne à travers les âges* (Lausanne, 1906); Meredith Read, *Historic Studies in Vaud, Berne and Savoy* (2 vols., 1897); M. Schmitt, *Mémoires hist. sur le diocèse de Lausanne* (2 vols., Fribourg, 1859); J. Stammler (afterwards bishop of Lausanne), *Le Trésor de la cathédrale de Lausanne* (Lausanne, 1902; trans. of a German book of 1894).

(W. A. B. C.)

## LAUTREC, ODET DE FOIX, Vicomte de

(1488-1528), French soldier. The branch of the viscounts of Lautrec originated with Pierre, the grandson of Archambaud de Grailly, captal de Buch, who came into possession of the county of Foix in 1401. Odet de Foix and his two brothers, the seigneur de Lescun and the seigneur de l'Esparre or Asparros, served Francis I. as captains; and the influence of their sister, Françoise de Châteaubriant, who became the king' mistress, gained them high offices. In 1515 Lautrec took part in the campaign of Marignano. In 1516 he received the government of the Milanese, and by his severity made the French domination insupportable. In 1521 he succeeded in defending the duchy against the Spanish army, but in 1522 he was completely defeated at the battle of the Bicocca, and was forced to evacuate the Milanese. The mutiny of his Swiss troops had compelled him, against his wish, to engage in the battle. Created marshal of France, he received again, in 1527, the command of the army of Italy, occupied the Milanese, and was then sent to undertake the conquest of the kingdom of Naples. The defection of Andrea Doria and the plague which broke out in the French camp brought on a fresh disaster. Lautrec himself caught the infection, and died on the 15th of August 1528. He had the reputation of a gallant and able soldier, but this reputation scarcely seems to be justified by the facts; though he was always badly used by fortune.

There is abundant MS. correspondence in the Bibliothèque Nationale, Paris. See the Works of Brantôme (Coll. Société d'Histoire de France, vol. iii., 1867); *Memoirs* of Martin du

Bellay (Coll. Michaud and Poujoulat, vol. v., 1838).

## LAUZUN, ANTONIN NOMPAR DE CAUMONT, Marquis de Puyguilhem, Duc de

(1632-1723), French courtier and soldier, was the son of Gabriel, comte de Lauzun, and his wife Charlotte, daughter of the duc de La Force. He was brought up with the children of his kinsman, the maréchal de Gramont, of whom the comte de Guiche became the lover of Henrietta of England, duchess of Orleans, while Catherine Charlotte, afterwards princess of Monaco, was the object of the one passion of Lauzun's life. He entered the army, and served under Turenne, also his kinsman, and in 1655 succeeded his father as commander of the *cent gentilshommes de la maison du roi*. Puyguilhem (or Péguilin, as contemporaries simplified his name) rapidly rose in Louis XIV.'s favour, became colonel of the royal regiment of dragoons, and was gazetted *maréchal de camp*. He and Mme de Monaco belonged to the coterie of the young duchess of Orleans. His rough wit and skill in practical jokes pleased Louis XIV., but his jealousy and violence were the causes of his undoing. He prevented a meeting between Louis XIV. and Mme de Monaco, and it was jealousy in this matter, rather than hostility to Louise de la Vallière, which led him to promote Mme de Montespan's intrigues with the king. He asked this lady to secure for him the post of grand-master of the artillery, and on Louis's refusal to give him the appointment he turned his back on the king, broke his sword, and swore that never again would he serve a monarch who had broken his word. The result was a short sojourn in the Bastille, but he soon returned to his functions of court buffoon. Meanwhile, the duchess of Montpensier (La Grande Mademoiselle) had fallen in love with the little man, whose ugliness seems to have exercised a certain fascination over many women. He naturally encouraged one of the greatest heiresses in Europe, and the wedding was fixed for the 20th of December 1670, when on the 18th Louis sent for his cousin and forbade the marriage. Mme de Montespan had never forgiven his fury when she failed to procure the grand-mastership of the artillery, and now, with Louvois, secured his arrest. He was removed in November 1671 from the Bastille to Pignerol, where excessive precautions were taken to ensure his safety. He was eventually allowed free intercourse with Fouquet, but before that time he managed to find a way through the chimney into Fouquet's room, and on another occasion succeeded in reaching the courtyard in safety. Another fellow-prisoner, from communication with whom he was supposed to be rigorously excluded, was Eustache Dauger (see Iron Mask).

It was now intimated to Mademoiselle that Lauzun's restoration to liberty depended on her immediate settlement of the principality of Dombes, the county of Eu and the duchy of Aumale—three properties assigned by her to Lauzun—on the little duc de Maine, eldest son of Louis XIV. and Mme de Montespan. She gave way, but Lauzun, even after ten years of imprisonment, refused to sign the documents, when he was brought to Bourbon for the purpose. A short term of imprisonment at Chalon-sur-Sâone made him change his mind, but when he was set free Louis XIV. was still set against the marriage, which is supposed to have taken place secretly (see Montpensier). Married or not, Lauzun was openly courting Fouquet's daughter, whom he had seen at Pignerol. He was to be restored to his place at court, and to marry Mlle Fouquet, who, however, became Mme d'Uzès in 1683. In 1685 Lauzun went to England to seek his fortune under James II., whom he had served as duke of York in Flanders. He rapidly gained great influence at the English court. In 1688 he was again in England, and arranged the flight of Mary of Modena and the infant prince, whom he accompanied to Calais, where he received strict instructions from Louis to bring them "on any pretext" to Vincennes. In the late autumn of 1689 he was put in command of the expedition fitted out at Brest for service in Ireland, and he sailed in the following year. Lauzun was honest, a quality not too common in James II.'s officials in Ireland, but had no experience of the field, and he blindly followed Richard Talbot, earl of Tyrconnel. After the battle of the Boyne they fled to Limerick, and thence to the west, leaving Patrick Sarsfield to show a brave front. In September they sailed for France, and on their arrival at Versailles Lauzun found that his failure had destroyed any prospect of a return of Louis XIV.'s favour. Mademoiselle died in 1693, and two years later Lauzun married Geneviève de Durfort, a child of fourteen, daughter of the maréchal de Lorges. Mary of Modena, through whose interest Lauzun secured his dukedom, retained her faith in him, and it was he who in 1715, more than a quarter of a century after the flight from Whitehall, brought her the news of the

disaster of Sheriffmuir. Lauzun died on the 19th of November 1723. The duchy fell to his nephew, Armand de Gontaut, comte de Biron.

See the letters of Mme de Sévigné, the memoirs of Saint-Simon, who was Lauzun's wife's brother-in-law; also J. Lair, *Nicolas Fouquet*, vol. ii. (1890); Martin Hailes, *Mary of Modena* (1905), and M. F. Sandars, *Lauzun, Courtier and Adventurer* (1908).

LAVA, an Italian word (from Lat. *lavare*, to wash) applied to the liquid products of volcanic activity. Streams of rain-water, formed by condensation of exhaled steam often mingled with volcanic ashes so as to produce mud, are known as *lava d'acqua*, whilst the streams of molten matter are called *lava di fuoco*. The term lava is applied by geologists to all matter of volcanic origin, which is, or has been, in a molten state. The magma, or molten lava in the interior of the earth, may be regarded as a mutual solution of various mineral silicates, charged with highly-heated vapour, sometimes to the extent of super-saturation. According to the proportion of silica, the lava is distinguished as "acid" or "basic." The basic lavas are usually darker and denser than lavas of acid type, and when fused they tend to flow to great distances, and may thus form far-spreading sheets, whilst the acid lavas, being more viscous, rapidly consolidate after extrusion. The lava is emitted from the volcanic vent at a high temperature, but on exposure to the air it rapidly consolidates superficially, forming a crust which in many cases is soon broken up by the continued flow of the subjacent liquid lava, so that the surface becomes rugged with clinkers. J. D. Dana introduced the term "aa" for this rough kind of lava-stream, whilst he applied the term "pahoehoe" to those flows which have a smooth surface, or are simply wrinkled and ropy; these terms being used in this sense in Hawaii, in relation to the local lavas. The different kinds of lava are more fully described in the article VOLCANO.



LAVABO (Lat. "I will wash"; the Fr. equivalent is lavoir), in ecclesiastical usage, the term for the washing of the priests' hands, at the celebration of the Mass, at the offertory. The words of Psalm xxvi. 6, *Lavabo inter innocentes manus meas*, are said during the rite. The word is also used for the basin employed in the ritual washing, and also for the lavatories, generally erected in the cloisters of monasteries. Those at Gloucester, Norwich and Lincoln are best known. A very curious example at Fontenay, surrounding a pillar, is given by Viollet-le-Duc. In general the lavabo is a sort of trough; in some places it has an almery for towels, &c.

LAVAGNA, a seaport of Liguria, Italy, in the province of Genoa, from which it is 25½ m. S.E. by rail. Pop. (1901) 7005. It has a small shipbuilding trade, and exports great quantities of slate (*lavagna*, taking its name from the town). It also has a large cotton-mill. It was the seat of the Fieschi family, independent counts, who, at the end of the 12th century, were obliged to recognize the supremacy of Genoa. Sinibaldo Fieschi became Pope Innocent IV. (1243-1254), and Hadrian V. (1276) was also a Fieschi.

LAVAL, ANDRÉ DE, SEIGNEUR DE LOHÉAC (*c.* 1408-1485), French soldier. In 1423 he served in the French army against England, and in 1428 was taken prisoner by John Talbot, 1st earl of Shrewsbury, after the capitulation of Laval, which he was defending. After paying his ransom he was present with Joan of Arc at the siege of Orleans, at the battle of Patay, and at the coronation of Charles VII. He was made admiral of France in 1437 and marshal in 1439. He served Charles VII. faithfully in all his wars, even against the dauphin (1456), and when the latter became king as Louis XI., Laval was dismissed from the marshal's office. After the War of the Public Weal he was restored to favour, and recovered the marshal's bâton, the king also granting him the offices of lieutenant-general to the government of Paris and governor of Picardy, and conferring upon him the collar of the order of St Michael. In 1472 Laval was successful in resisting the attacks of Charles the Bold, duke of Burgundy, on Beauvais.

LAVAL, a town of north-western France, capital of the department of Mayenne, on the Mayenne river, 188 m. W.S.W. of Paris by rail. Pop. (1906) 24,874. On the right bank of the river stands the old feudal city, with its ancient castle and its irregularly built houses whose slate roofs and pointed gables peep from the groves of trees which clothe the hill. On the left bank the regularly built new town extends far into the plain. The river, here 80 yds. broad, is crossed by the handsome railway viaduct, a beautiful stone bridge called Pont Neuf, and the Pont Vieux with three pointed arches, built in the 16th century. There is communication by steamer as far as Angers. Laval may justly claim to be one of the loveliest of French towns. Its most curious and interesting monument is the sombre old castle of the counts (now a prison) with a donjon of the 12th century, the roof of which presents a fine example of the timberwork superseded afterwards by stone machicolation. The "new castle," dating partly from the Renaissance, serves as court-house. Laval possesses several churches of different periods: in that of the Trinity, which serves as the cathedral, the transept and nave are of the 12th century while the choir is of the 16th; St Vénérand (15th century) has good stained glass; Notre-Dame des Cordeliers, which dates from the end of the 14th century or the beginning of the 15th, has some fine marble altars. Half-a-mile below the Pont Vieux is the beautiful 12th-century church of Avenières, with an ornamental spire of 1534. The finest remaining relic of the ancient fortifications is the Beucheresse gate near the cathedral. The narrow streets around the castle are bordered by many old houses of the 15th and 16th century, chief among which is that known as the "Maison du Grand Veneur." There are an art-museum, a museum of natural history and archaeology and a library. The town is embellished by fine promenades, at the entrance of one of which, facing the mairie, stands the statue of the celebrated surgeon Ambroise Paré (1517-1590). Laval is the seat of a prefect, a bishopric created in 1855, and a court of assizes, and has tribunals of first instance and of commerce, a chamber of commerce, a board of trade-arbitrators, training colleges, an ecclesiastical seminary and a lycée for boys. The principal industry of the town is the cloth manufacture, introduced from Flanders in the 14th century. The production of fabrics of linen, of cotton or of mixtures of both, occupies some 10,000 hands in the town and suburbs. Among the numerous other industries are metal-founding, flour-milling, tanning, dyeing, the making of boots and shoes, and the sawing of the marble quarried in the vicinity. There is trade in grain.

Laval is not known to have existed before the 9th century. It was taken by John Talbot, earl of Shrewsbury, in 1428, changed hands several times during the wars of the League, and played an important part at the end of the 18th century in the war of La Vendée.

SEIGNEURS AND COUNTS OF LAVAL. The castle of Laval was founded at the beginning of the 11th century by a lord of the name of Guy, and remained in the possession of his male descendants until the 13th century. In 1218 the lordship passed to the house of Montmorency by the marriage of Emma, daughter of Guy VI. of Laval, to Mathieu de Montmorency, the hero of the battle of Bouvines. Of this union was born Guy VII. seigneur of

Laval, the ancestor of the second house of Laval. Anne of Laval (d. 1466), the heiress of the second family, married John de Montfort, who took the name of Guy (XIII.) of Laval. At Charles VII.'s coronation (1429) Guy XIV., who was afterwards son-in-law of John V., duke of Brittany, and father-in-law of King René of Anjou, was created count of Laval, and the countship remained in the possession of Guy's male descendants until 1547. After the Montforts, the countship of Laval passed by inheritance to the families of Rieux and Sainte Maure, to the Colignys, and finally to the La Trémoilles, who held it until the Revolution.

See Bertrand de Broussillon, *La Maison de Laval* (3 vols., 1895-1900).

## LA VALLIÈRE, LOUISE FRANÇOISE DE

(1644-1710), mistress of Louis XIV., was born at Tours on the 6th of August 1644, the daughter of an officer, Laurent de la Baume le Blanc, who took the name of La Vallière from a small property near Amboise. Laurent de la Vallière died in 1651; his widow, who soon married again, joined the court of Gaston d'Orléans at Blois. Louise was brought up with the younger princesses, the step-sisters of La Grande Mademoiselle. After Gaston's death his widow moved with her daughters to the palace of the Luxembourg in Paris, and with them went Louise, who was now a girl of sixteen. Through the influence of a distant kinswoman, Mme de Choisy, she was named maid of honour to Henrietta of England, who was about her own age and had just married Philip of Orleans, the king's brother. Henrietta joined the court at Fontainebleau, and was soon on the friendliest terms with her brother-in-law, so friendly indeed that there was some scandal, to avoid which it was determined that Louis should pay marked attentions elsewhere. The person selected was Madame's maid of honour, Louise. She had been only two months in Fontainebleau before she became the king's mistress. The affair, begun on Louis's part as a blind, immediately developed into real passion on both sides. It was Louis's first serious attachment, and Louise was an innocent, religious-minded girl, who brought neither coquetry nor self-interest to their relation, which was sedulously concealed. Nicolas Fouquet's curiosity in the matter was one of the causes of his disgrace. In February 1662 there was a storm when Louise refused to tell her lover the relations between Madame (Henrietta) and the comte de Guiche. She fled to an obscure convent at Chaillot, where Louis rapidly followed her. Her enemies, chief of whom was Olympe Mancini, comtesse de Soissons, Mazarin's niece, sought her downfall by bringing her liaison to the ears of Queen Maria Theresa. She was presently removed from the service of Madame, and established in a small building in the Palais Royal, where in December 1663 she gave birth to a son Charles, who was given in charge to two faithful servants of Colbert. Concealment was practically abandoned after her return to court, and within a week of Anne of Austria's death in January 1666, La Vallière appeared at mass side by side with Maria Theresa. But her favour was already waning. She had given birth to a second child in January 1665, but both children were dead before the autumn of 1666. A daughter born at Vincennes in October 1666, who received the name of Marie Anne and was known as Mlle de Blois, was publicly recognized by Louis as his daughter in letters-patent making the mother a duchess in May 1667 and conferring on her the estate of Vaujours. In October of that year she bore a son, but by this time her place in Louis's affections was definitely usurped by Athénaïs de Montespan (*q.v.*), who had long been plotting against her. She was compelled to remain at court as the king's official mistress, and even to share Mme de Montespan's apartments at the Tuileries. She made an attempt at escape in 1671, when she fled to the convent of Ste Marie de Chaillot, only to be compelled to return. In 1674 she was finally permitted to enter the Carmelite convent in the Rue d'Enfer. She took the final vows a year later, when Bossuet pronounced the allocution.



Her daughter married Armand de Bourbon, prince of Conti, in 1680. The count of Vermandois, her youngest born, died on his first campaign at Courtrai in 1683.

La Vallière's *Réflexions sur la miséricorde de Dieu*, written after her retreat, were printed by Lequeux in 1767, and in 1860 *Réflexions, lettres et sermons*, by M. P. Clement (2 vols.). Some apocryphal *Mémoires* appeared in 1829, and the *Lettres de Mme la duchesse de la Vallière* (1767) are a corrupt version of her correspondence with the maréchal de Bellefonds. Of modern works on the subject see Arsène Houssaye, *Mlle de la Vallière et Mme de Montespan* (1860); Jules Lair, *Louise de la Vallière* (3rd ed., 1902, Eng. trans., 1908); and C.

Bonnet, *Documents inédits sur Mme de la Vallière* (1904).

LAVATER, JOHANN KASPAR (1741-1801), German poet and physiognomist, was born at Zürich on the 15th of November 1741. He was educated at the gymnasium of his native town, where J. J. Bodmer and J. J. Breitinger were among his teachers. When barely one-and-twenty he greatly distinguished himself by denouncing, in conjunction with his friend, the painter H. Fuseli, an iniquitous magistrate, who was compelled to make restitution of his ill-gotten gains. In 1769 Lavater took orders, and officiated till his death as deacon or pastor in various churches in his native city. His oratorical fervour and genuine depth of conviction gave him great personal influence; he was extensively consulted as a casuist, and was welcomed with demonstrative enthusiasm in his numerous journeys through Germany. His mystical writings were also widely popular. Scarcely a trace of this influence has remained, and Lavater's name would be forgotten but for his work on physiognomy, *Physiognomische Fragmente zur Beförderung der Menschenkenntnis und Menschenliebe* (1775-1778). The fame even of this book, which found enthusiastic admirers in France and England, as well as in Germany, rests to a great extent upon the handsome style of publication and the accompanying illustrations. It left, however, the study of physiognomy (*q.v.*), as desultory and unscientific as it found it. As a poet, Lavater published *Christliche Lieder* (1776-1780) and two epics, *Jesus Messias* (1780) and *Joseph von Arimathia* (1794), in the style of Klopstock. More important and characteristic of the religious temperament of Lavater's age are his introspective *Aussichten in die Ewigkeit* (4 vols., 1768-1778); *Geheimes Tagebuch von einem Beobachter seiner selbst* (2 vols., 1772-1773) and *Pontius Pilatus, oder der Mensch in allen Gestalten* (4 vols., 1782-1785). From 1774 on, Goethe was intimately acquainted with Lavater, but at a later period he became estranged from him, somewhat abruptly accusing him of superstition and hypocrisy. Lavater had a mystic's indifference to historical Christianity, and, although esteemed by himself and others a champion of orthodoxy, was in fact only an antagonist of rationalism. During the later years of his life his influence waned, and he incurred ridicule by some exhibitions of vanity. He redeemed himself by his patriotic conduct during the French occupation of Switzerland, which brought about his tragical death. On the taking of Zürich by the French in 1799, Lavater, while endeavouring to appease the soldiery, was shot through the body by an infuriated grenadier; he died after long sufferings borne with great fortitude, on the 2nd of January 1801.

Lavater himself published two collections of his writings, *Vermischte Schriften* (2 vols., 1774-1781), and *Kleinere prosaische Schriften* (3 vols., 1784-1785). His *Nachgelassene Schriften* were edited by G. Gessner (5 vols., 1801-1802); *Sämtliche Werke* (but only poems) (6 vols., 1836-1838); *Ausgewählte Schriften* (8 vols., 1841-1844). See G. Gessner, *Lavaters Lebensbeschreibung* (3 vols., 1802-1803); U. Hegner, *Beiträge zur Kenntnis Lavaters* (1836); F. W. Bodemann, *Lavater nach seinem Leben, Lehren und Wirken* (1856; 2nd ed., 1877); F. Muncker, *J. K. Lavater* (1883); H. Waser, *J. K. Lavater nach Hegners Aufzeichnungen* (1894); *J. K. Lavater, Denkschrift zum 100. Todestag* (1902).

LAVAUR, a town of south-western France, capital of an arrondissement in the department of Tarn, 37 m. S.E. of Montauban by rail. Pop. (1906), town 4069; commune 6388. Lavaur stands on the left bank of the Agout, which is here crossed by a railway-bridge and a fine stone bridge of the late 18th century. From 1317 till the Revolution Lavaur was the seat of a bishopric, and there is a cathedral dating from the 13th, 14th and 15th centuries, with an octagonal bell-tower; a second smaller square tower contains a *jaquemart* (a statue which strikes the hours with a hammer) of the 16th century. In the bishop's garden is the statue of Emmanuel Augustin, marquis de Las Cases, one of the companions of

Napoleon at St Helena. The town carries on distilling and flour-milling and the manufacture of brushes, plaster and wooden shoes. There are a subprefecture and tribunal of first instance. Lavaur was taken in 1211 by Simon de Montfort during the wars of the Albigenses, and several times during the religious wars of the 16th century.

LAVEDAN, HENRI LÉON ÉMILE (1859- ), French dramatist and man of letters, was born at Orleans, the son of Hubert Léon Lavedan, a well-known Catholic and liberal journalist. He contributed to various Parisian papers a series of witty tales and dialogues of Parisian life, many of which were collected in volume form. In 1891 he produced at the Théâtre Français *Une Famille*, followed at the Vaudeville in 1894 by *Le Prince d'Aurec*, a satire on the nobility, afterwards re-named *Les Descendants*. Later brilliant and witty pieces were *Les Deux noblesses* (1897), *Catherine* (1897), *Le Nouveau jeu* (1898), *Le Vieux marcheur* (1899), *Le Marquis de Priola* (1902), and *Varennes* (1904), written in collaboration with G. Lenôtre. He had a great success with *Le Duel* (Comédie Française, 1905), a powerful psychological study of the relations of two brothers. Lavedan was admitted to the French Academy in 1898.

LAVELEYE, ÉMILE LOUIS VICTOR DE (1822-1892), Belgian economist, was born at Bruges on the 5th of April 1822, and educated there and at the Collège Stanislas in Paris, a celebrated establishment in the hands of the Oratorians. He continued his studies at the Catholic university of Louvain and afterwards at Ghent, where he came under the influence of François Huet, the philosopher and Christian Socialist. In 1844 he won a prize with an essay on the language and literature of Provence. In 1847 he published *L'Histoire des rois francs*, and in 1861 a French version of the *Nibelungen*, but though he never lost his interest in literature and history, his most important work was in the domain of economics. He was one of a group of young lawyers, doctors and critics, all old pupils of Huet, who met once a week to discuss social and economic questions, and was thus led to publish his views on these subjects. In 1859 some articles by him in the *Revue des deux mondes* laid the foundation of his reputation as an economist. In 1864 he was elected to the chair of political economy at the state university of Liége. Here he wrote his most important works: *La Russie et l'Autriche depuis Sadowa* (1870), *Essai sur les formes de gouvernement dans les sociétés modernes* (1872), *Des Causes actuelles de guerre en Europe et de l'arbitrage* and *De la propriété et de ses formes primitives* (1874), dedicated to the memory of John Stuart Mill and François Huet. He died at Doyon, near Liége, on the 3rd of January 1892. Laveleye's name is particularly connected with bimetallism and primitive property, and he took a special interest in the revival and preservation of small nationalities. But his activity included the whole realm of political science, political economy, monetary questions, international law, foreign and Belgian politics, questions of education, religion and morality, travel and literature. He had the art of popularizing even the most technical subjects, owing to the clearness of his view and his firm grasp of the matter in hand. He was especially attracted to England, where he thought he saw many of his ideals of social, political and religious progress realized. He was a frequent contributor to the English newspapers and leading reviews. The most widely circulated of his works was a pamphlet on *Le Parti clérical en Belgique*, of which 2,000,000 copies were circulated in ten languages.



LAVENDER, botanically *Lavandula*, a genus of the natural order Labiatae distinguished by an ovate tubular calyx, a two-lipped corolla, of which the upper lip has two and the lower three lobes, and four stamens bent downwards.

The plant to which the name of lavender is commonly applied, *Lavandula vera*, is a native of the mountainous districts of the countries bordering on the western half of the Mediterranean, extending from the eastern coast of Spain to Calabria and northern Africa, growing in some places at a height of 4500 ft. above the sea-level, and preferring stony declivities in open sunny situations. It is cultivated in the open air as far north as Norway and Livonia. Lavender forms an evergreen under-shrub about 2 ft. high, with greyish-green hoary linear leaves, rolled under at the edges when young; the branches are erect and give a bushy appearance to the plant. The flowers are borne on a terminal spike at the summit of a long naked stalk, the spike being composed of 6-10 dense clusters in the axils of small, brownish, rhomboidal, tapering, opposite bracts, the clusters being more widely separated towards the base of the spike. The calyx is tubular, contracted towards the mouth, marked with 13 ribs and 5-toothed, the posterior tooth being the largest. The corolla is of a pale violet colour, but darker on its inner surface, tubular, two-lipped, the upper lip with two and the lower with three lobes. Both corolla and calyx are covered with stellate hairs, amongst which are imbedded shining oil glands to which the fragrance of the plant is due. The leaves and flowers of lavender are said to have been used by the ancients to perfume their baths; hence the Med. Lat. name *Lavandula* or *Lavendula* is supposed to have been derived from *lavare*, to wash. This derivation is considered doubtful and a connexion has been suggested with Lat. *livere*, to be of a bluish, pale or livid colour.

Although *L. Stoechas* was well known to the ancients, no allusion unquestionably referring to *L. vera* has been found in the writings of classical authors, the earliest mention of the latter plant being in the 12th century by the abbess Hildegard, who lived near Bingen on the Rhine. Under the name of *llafant* or *llafantly* it was known to the Welsh physicians as a medicine in the 13th century. The dried flowers have long been used in England, the United States and other countries for perfuming linen, and the characteristic cry of “Lavender! sweet lavender!” was still to be heard in London streets at the beginning of the 20th century. In England lavender is cultivated chiefly for the distillation of its essential oil, of which it yields on an average 1½% when freed from the stalks, but in the south of Europe the flowers form an object of trade, being exported to the Barbary states, Turkey and America.

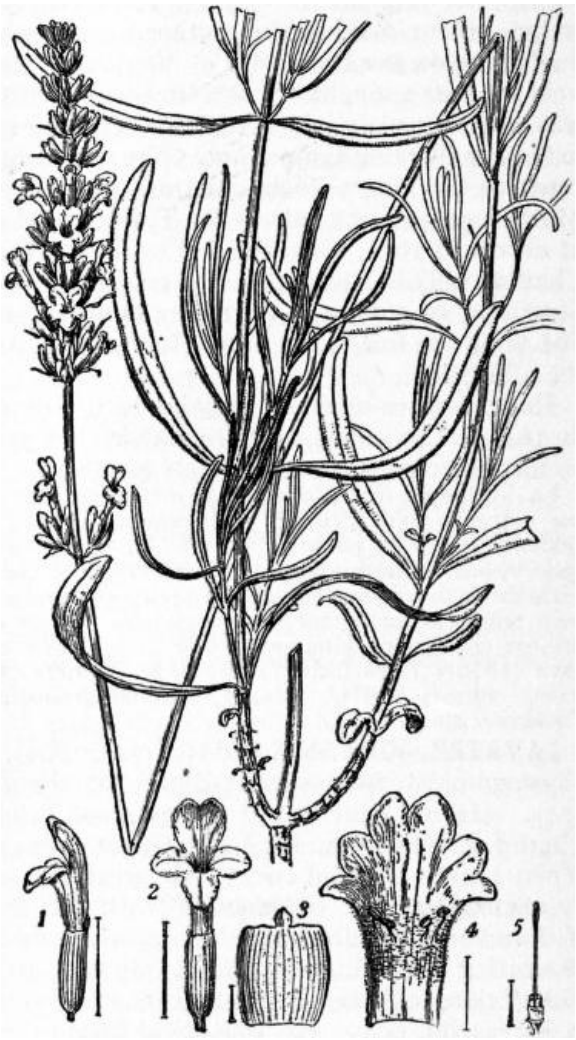
In Great Britain lavender is grown in the parishes of Mitcham, Carshalton and Beddington in Surrey, and in Hertfordshire in the parish of Hitchin. The most suitable soil seems to be a sandy loam with a calcareous substratum, and the most favourable position a sunny slope in localities elevated above the level of fogs, where the plant is not in danger of early frost and is freely exposed to air and light. At Hitchin lavender is said to have been grown as early as 1568, but as a commercial speculation its cultivation dates back only to 1823. The plants at present in cultivation do not produce seed, and the propagation is always made by slips or by dividing the roots. The latter plan has only been followed since 1860, when a large number of lavender plants were killed by a severe frost. Since that date the plants have been subject to the attack of a fungus, in consequence of which the price of the oil has been considerably enhanced.

The flowers are collected in the beginning of August, and taken direct to the still. The yield of oil depends in great measure upon the weather. After a wet and dull June and July the yield is sometimes only half as much as when the weather has been bright and sunshiny. From 12 to 30 ℔ of oil per acre is the average amount obtained. The oil contained in the stem has a more rank odour and is less volatile than that of the flowers; consequently the portion that distils over after the first hour and a half is collected separately.

The finest oil is obtained by the distillation of the flowers, without the stalks, but the labour spent upon this adds about 10s. per ℔ to the expense of the oil, and the same end is practically attained by fractional distillation. The oil mellows by keeping three years, after which it deteriorates unless mixed with alcohol; it is also improved by redistillation. Oil of lavender is distilled from the wild plants in

Piedmont and the South of France, especially in the villages about Mont Ventoux near Avignon, and in those some leagues west of Montpellier. The best French oil realizes scarcely one-sixth of the price of the English oil. Cheaper varieties are made by distilling the entire plant.

Oil of lavender is a mobile liquid having a specific gravity from 0.85 to 0.89. Its chief constituents are linalool acetate, which also occurs in oil of bergamot, and linalool, $C_{10}H_{17}OH$, an alcohol derived by oxidation from myrcene, $C_{10}H_{16}$, which is one of the terpenes. The dose is ½-3 minims. The British pharmacopeia contains a spiritus lavandulae, dose 5-20 minims: and a compound tincture, dose ½-1 drachm. This is contained in liquor arsenicalis, and its characteristic odour may thus be of great practical importance, medico-legally and otherwise. The pharmacology of oil of lavender is simply that of an exceptionally pleasant and mild volatile oil. It is largely used as a carminative and as a colouring and flavouring agent. Its adulteration with alcohol may be detected by chloride of calcium dissolving in it and forming a separate layer of liquid at the bottom of the vessel. Glycerine acts in the same way. If it contain turpentine it will not dissolve in three volumes of alcohol, in which quantity the pure oil is perfectly soluble.




Lavender (*Lavandula vera*).

1. Flower, side view.
2. Flower, front view.
3. Calyx opened and spread flat.
4. Corolla opened and spread flat.
5. Pistil.

Lavender flowers were formerly considered good for “all disorders of the head and nerves”; a spirit prepared with them was known under the name of palsy drops.

Lavender water consists of a solution of the volatile oil in spirit of wine with the addition of the essences of musk, rose, bergamot and ambergris, but is very rarely prepared by distillation of the flowers with spirit.



In the climate of New York lavender is scarcely hardy, but in the vicinity of Philadelphia considerable quantities are grown for the market. In American gardens sweet basil (*Ocimum basilicum*) is frequently called lavender.

*Lavandula Spica*, a species which differs from *L. vera* chiefly in its smaller size, more crowded leaves and linear bracts, is also used for the distillation of an essential oil, which is known in England as oil of spike and in France under the name of *essence d’aspic*. It is used in painting on porcelain and in veterinary medicine. The oil as met with in commerce is less fragrant than that of *L. vera*—probably because the whole plant is distilled, for the flowers of the two species are scarcely distinguishable in fragrance. *L. Spica* does not extend so far north, nor ascend the mountains beyond 2000 ft. It cannot be cultivated in Britain except in sheltered situations. A nearly allied species, *L. lanata*, a native of Spain, with broader leaves, is also very fragrant, but does not appear to be distilled for oil.

*Lavandula Stoechas*, a species extending from the Canaries to Asia Minor, is distinguished from the above plants by its blackish purple flowers, and shortly stalked spikes crowned by conspicuous purplish sterile bracts. The flowers were official in the London pharmacopoeia as late as 1746. They are still used by the Arabs as an expectorant and antispasmodic. The Stoechades (now called the isles of Hyères near Toulon) owed their name to the abundance of the plant growing there.

Other species of lavender are known, some of which extend as far east as to India. A few which differ from the above in having divided leaves, as *L. dentata*, *L. abrotanoides*, *L. multifolia*, *L. pinnata* and *L. viridis*, have been cultivated in greenhouses, &c., in England.

Sea lavender is a name applied in England to several species of *Statice*, a genus of littoral plants belonging to the order *Plumba gineae*. Lavender cotton is a species of the genus *Santolina*, small, yellow-flowered, evergreen undershrubs of the Composite order.

LAVERDY, CLÉMENT CHARLES FRANÇOIS DE (1723-1793), French statesman, was a member of the parlement of Paris when the case against the Jesuits came before that body in August 1761. He demanded the suppression of the order and thus acquired popularity. Louis XV. named him controller-general of the finances in December 1763, but the burden was great and Laverdy knew nothing of finance. Three months after his nomination he forbade anything of any kind whatever to be printed concerning his administration, thus refusing advice as well as censure. He used all sorts of expedients, sometimes dishonest, to replenish the treasury, and was even accused of having himself profited from the commerce in wheat. A court intrigue led to his sudden dismissal on the 1st of October 1768. Henceforward he lived in retirement until, during the Revolution, he was involved in the charges against the financiers of the old régime. The Revolutionary tribunal condemned him to death, and he was guillotined on the 24th of November 1793.

See A. Jobez, *La France sous Louis XV* (1869).

LAVERNA, an old Italian divinity, originally one of the spirits of the underworld. A cup found in an Etruscan tomb bears the inscription “Lavernai Pocolom,” and in a fragment of Septimius Serenus Laverna is expressly mentioned in connexion with the *di inferi*. By an easy transition, she came to be regarded as the protectress of thieves, whose operations were associated with darkness. She had an altar on the Aventine hill, near the gate called after her Lavernalis, and a grove on the Via Salaria. Her aid was invoked by thieves to enable them to carry out their plans successfully without forfeiting their reputation for piety and honesty (Horace, *Ep.* i. 16, 60). Many explanations have been given of the name: (1) from *latere* (Schol. on Horace, who gives *laternio* as another form of *lavernio* or robber); (2) from *lavare* (Acron on Horace, according to whom thieves were called *lavatores*, perhaps referring to bath thieves); (3) from *levare* (cf. shop-lifters). Modern etymologists connect it with *lu-crum*, and explain it as meaning the goddess of gain.

LAVERY, JOHN (1857- ), British painter, was born in Belfast, and received his art training in Glasgow, London and Paris. He was elected associate of the Royal Scottish Academy in 1892 and academician in 1896, having won a considerable reputation as a painter of portraits and figure subjects, and as a facile and vigorous executant. He became also vice-president of the International Society of sculptors, painters and gravers. Many of his paintings have been acquired for public collections, and he is represented in the National Galleries at Brussels, Berlin and Edinburgh, in the Carnegie Institute at Pittsburg, the Philadelphia Gallery, the New South Wales Gallery, the Modern Gallery, Venice, the Pinakothek, Munich, the Glasgow Corporation Gallery, and the Luxembourg.

LAVIGERIE, CHARLES MARTIAL ALLEMAND (1825-1892), French divine, cardinal archbishop of Carthage and Algiers and primate of Africa, was born at Bayonne on the 31st of October 1825, and was educated at St Sulpice, Paris. He was ordained priest in 1849, and was professor of ecclesiastical history at the Sorbonne from 1854 to 1856. In 1856 he accepted the direction of the schools of the East, and was thus for the first time brought into contact with the Mahommedan world. “C’est là,” he wrote, “que j’ai connu enfin ma vocation.” Activity in missionary work, especially in alleviating the distresses of the victims of the Druses, soon brought him prominently into notice; he was made a chevalier of the Legion of Honour, and in October 1861, shortly after his return to Europe, was appointed French auditor at Rome. Two years later he was raised to the see of Nancy, where he remained for four years, during which the diocese became one of the best administered in France. While bishop of Nancy he met Marshal MacMahon, then governor-general of Algeria, who in 1866 offered him the see of Algiers, just raised to an archbishopric. Lavigerie landed in Africa on the 11th of May 1868, when the great famine was already making itself felt, and he began in November to collect the orphans into villages. This action, however, did not meet with the approval of MacMahon, who feared that the Arabs would resent it as an infraction of the religious peace, and thought that the Mahommedan church, being a state institution in Algeria, ought to be protected from proselytism; so it was intimated to the prelate that his sole duty was to minister to the colonists. Lavigerie, however, continued his self-imposed task, refused the archbishopric of Lyons, which was offered to him by the emperor, and won his point. Contact with the natives during the famine caused Lavigerie to entertain exaggerated hopes for their general conversion, and his enthusiasm was such that he offered to resign his archbishopric in order to devote himself entirely to the missions. Pius IX. refused this, but granted him a coadjutor, and placed the whole of equatorial Africa under his charge. In 1870 Lavigerie warmly supported papal infallibility. In 1871 he was twice a candidate for the National Assembly, but was defeated. In 1874 he founded the Sahara and Sudan mission, and sent missionaries to Tunis, Tripoli, East Africa and the Congo. The order of African missionaries thus founded, for which Lavigerie himself drew up the rule, has since become famous as the *Pères Blancs*. From 1881 to 1884 his activity in Tunisia so raised the prestige of France that it drew from Gambetta the celebrated declaration, *L’Anticléricalisme n’est pas un article d’exportation*, and led to the exemption of Algeria from the application of the decrees concerning the religious orders. On the 27th of March 1882 the dignity of cardinal was conferred upon Lavigerie, but the great object of his ambition was to restore the see of St Cyprian; and in that also he was successful, for by a bull of 10th November 1884 the metropolitan see of Carthage was re-erected, and Lavigerie received the pallium on the 25th of January 1885. The later years of his life were spent in ardent anti-slavery propaganda, and his eloquence moved large audiences in London, as well as in Paris, Brussels and other parts of the continent. He hoped, by organizing a fraternity of armed laymen as pioneers, to restore fertility to the Sahara; but this community did not succeed, and was dissolved before his death. In 1890 Lavigerie appeared in the new character of a politician, and arranged with Pope Leo XIII. to make an attempt to reconcile the church with the republic. He invited the officers of the Mediterranean squadron to lunch at Algiers, and, practically renouncing his monarchical sympathies, to which he clung as long as the comte de Chambord was alive, expressed his support of the republic. and emphasized it by having the Marseillaise played by a band of his *Pères Blancs*. The further steps in this evolution emanated from the pope, and Lavigerie, whose health now began to fail, receded comparatively into the background. He died at Algiers on the 26th of November 1892.



(G. F. B.)

LA VILLEMARQUÉ, THÉODORE CLAUDE HENRI, Vicomte Hersart de (1815-1895), French philologist and man of letters, was born at Keransker, near Quimperlé, on the 6th of July 1815. He was descended from an old Breton family, which counted among its members a Hersart who had followed Saint Louis to the Crusade, and another who was a

companion in arms of Du Guesclin. La Villemarqué devoted himself to the elucidation of the monuments of Breton literature. Introduced in 1851 by Jacob Grimm as correspondent to the Academy of Berlin, he became in 1858 a member of the Academy of Inscriptions. His works include: *Contes populaires des anciens Bretons* (1842), to which was prefixed an essay on the origin of the romances of the Round Table; *Essai sur l'histoire de la langue bretonne* (1837); *Poèmes des bardes bretons du sixième siècle* (1850); *La Légende celtique en Irelande, en Cambrie et en Bretagne* (1859). The popular Breton songs published by him in 1839 as *Barzaz Breiz* were considerably retouched. La Villemarqué's work has been superseded by the work of later scholars, but he has the merit of having done much to arouse popular interest in his subject. He died at Keransker on the 8th of December 1895.

On the subject of the doubtful authenticity of Barzaz Breiz, see Luzel's Preface to his *Chansons populaires de la Basse-Bretagne*, and, for a list of works on the subject, the *Revue Celtique* (vol. v.).

LAVINIUM, an ancient town of Latium, on the so-called Via Lavinatis (see LAURENTINA, VIA), 19 m. S. of Rome, the modern PRATICA, situated 300 ft. above sea-level and 2½ m. N.E. from the sea-coast. Its foundation is attributed to Aeneas (whereas Laurentum was the primitive city of King Latinus), who named it after his wife Lavinia. It is rarely mentioned in Roman history and often confused with Lanuvium or Lanivium in the text both of authors and of inscriptions. The custom by which the consuls and praetors or dictators sacrificed on the Alban Mount and at Lavinium to the Penates and to Vesta, before they entered upon office or departed for their province, seems to have been one of great antiquity. There is no trace of its having continued into imperial times, but the cults of Lavinium were kept up, largely by the imperial appointment of honorary non-resident citizens to hold the priesthoods. The citizens of Lavinium were known under the empire as Laurentes Lavinates, and the place itself at a late period as Laurolavinium. It was deserted or forgotten not long after the time of Theodosius.

Lavinium was preceded by a more ancient town, LAURENTUM, the city of Latinus (Verg. *Aen.* viii.); of this the site is uncertain, but it is probably to be sought at the modern Tor Paterno, close to the sea-coast and 5 m. N. by W. of Lavinium. Here the name of Laurentum is preserved by the modern name Pantan di Lauro. Even in ancient times it was famous for its groves of bay-trees (*laurus*) from which its name was perhaps derived, and which in imperial times gave the villas of its territory a name for salubrity, so that both Vitellius and Commodus resorted there. The exact date of the abandonment of the town itself and the incorporation of its territory with that of Lavinium is uncertain, but it may be placed in the latter part of the republic. Under the empire a portion of it must have been imperial domain and forest. We hear of an imperial, procurator in charge of the elephants at Laurentum; and the imperial villa may perhaps be identified with the extensive ruins at Tor Paterno itself. The remains of numerous other villas lie along the ancient coast-line (which was half a mile inland of the modern, being now marked by a row of sand-hills, and was followed by the Via Severiana), both north-west and south-east of Tor Paterno: they extended as a fact in an almost unbroken line along the low sandy coast—now entirely deserted and largely occupied by the low scrub which serves as cover for the wild boars of the king of Italy's preserves—from the mouth of the Tiber to Antium, and thence again to Astura; but there are no traces of any buildings previous to the imperial period. In one of these villas, excavated by the king of Italy in 1906, was found a fine replica of the famous discobolus of Myron. The plan of the building is interesting, as it diverges entirely from the normal type and adapts itself to the site. Some way to the N.W. was situated the village of Vicus Augustanus Laurentium, taking its name probably from Augustus himself, and probably identical with the village mentioned by Pliny the younger as separated by only one villa from his own. This village was brought to light by excavation in 1874, and its forum and curia are still visible. The remains of the villa of Pliny, too, were excavated in 1713 and in 1802-1819, and it is noteworthy that the place bears the name Villa di Pino (sic) on the staff map; how old the name is, is uncertain. It is impossible without further excavation to reconcile the remains—mainly of substructions—with the elaborate description of his villa given by Pliny (cf. H. Winnefeld in *Jahrbuch des Instituts*, 1891, 200 seq.).

The site of the ancient Lavinium, no less than 300 ft. above sea-level and 2½ m. inland, is far healthier than the low-lying Laurentum, where, except in the immediate vicinity of the coast, malaria must have been a dreadful scourge. It possesses considerable natural strength, and consists of a small hill, the original acropolis, occupied by the modern castle and the village surrounding it, and a larger one, now given over to cultivation, where the city stood. On the former there are now no traces of antiquity, but on the latter are scanty remains of the city walls, in small blocks of the grey-green tufa (*cappellaccio*) which is used in the earliest buildings of Rome, and traces of the streets. The necropolis, too, has been discovered, but not systematically excavated; but objects of the first Iron age, including a sword of Aegean type (thus confirming the tradition), have been found; also remains of a building with Doric columns of an archaistic type, remains of later buildings in brick, and inscriptions, some of them of considerable interest.

See R. Lanciani in *Monumenti dei Lincei*, xiii. (1903), 133 seq.; xvi. (1906), 241 seq.

(T. As.)

**LAVISSE, ERNEST** (1842- ), French historian, was born at Nouvion-en-Thiérache, Aisne, on the 17th of December 1842. In 1865 he obtained a fellowship in history, and in 1875 became a doctor of letters; he was appointed *maître de conférence* (1876) at the école normale supérieure, succeeding Fustel de Coulanges, and then professor of modern history at the Sorbonne (1888), in the place of Henri Wallon. He was an eloquent professor and very fond of young people, and played an important part in the revival of higher studies in France after 1871. His knowledge of pedagogy was displayed in his public lectures and his addresses, in his private lessons, where he taught a small number of pupils the historical method, and in his books, where he wrote *ad probandum* at least as much as *ad narrandum*: class-books, collections of articles, intermingled with personal reminiscences (*Questions d'enseignement national*, 1885; *Études et étudiants*, 1890; *À propos de nos écoles*, 1895), rough historical sketches (*Vue générale de l'histoire politique de l'Europe*, 1890), &c. Even his works of learning, written without a trace of pedantry, are remarkable for their lucidity and vividness.

After the Franco-Prussian War Lavisse studied the development of Prussia and wrote *Étude sur l'une des origines de la monarchie prussienne, ou la Marche de Brandebourg sous la dynastie ascanienne*, which was his thesis for his doctor's degree in 1875, and *Études sur l'histoire de la Prusse* (1879). In connexion with his study of the Holy Roman Empire, and the cause of its decline, he wrote a number of articles which were published in the *Revue des Deux Mondes*; and he wrote *Trois empereurs d'Allemagne* (1888), *La Jeunesse du grand Frédéric* (1891) and *Frédéric II. avant son avènement* (1893) when studying the modern German empire and the grounds for its strength. With his friend Alfred Rambaud he conceived the plan of *L'Histoire générale du IV^e siècle jusqu'à nos jours*, to which, however, he contributed nothing. He edited the *Histoire de France depuis les origines jusqu'à la Révolution* (1901- ), in which he carefully revised the work of his numerous assistants, reserving the greatest part of the reign of Louis XIV. for himself. This section occupies the whole of volume vii. It is a remarkable piece of work, and the sketch of absolute government in France during this period has never before been traced with an equal amount of insight and brilliance. Lavisse was admitted to the Académie Française on the death of Admiral Jurien de la Gravière in 1892, and after the death of James Darmesteter became editor of the *Revue de Paris*. He is, however, chiefly a master of pedagogy. When the école normale was joined to the university of Paris, Lavisse was appointed director of the new organization, which he had helped more than any one to bring about.



**LAVOISIER, ANTOINE LAURENT** (1743-1794), French chemist, was born in

Paris on the 26th of August 1743. His father, an *avocat au parlement*, gave him an excellent education at the collège Mazarin, and encouraged his taste for natural science; and he studied mathematics and astronomy with N. L. de Lacaille, chemistry with the elder Rouelle and botany with Bernard de Jussieu. In 1766 he received a gold medal from the Academy of Sciences for an essay on the best means of lighting a large town; and among his early work were papers on the analysis of gypsum, on thunder, on the aurora and on congelation, and a refutation of the prevalent belief that water by repeated distillation is converted into earth. He also assisted J. E. Guettard (1715-1786) in preparing his mineralogical atlas of France. In 1768, recognized as a man who had both the ability and the means for a scientific career, he was nominated *adjoint chimiste* to the Academy, and in that capacity made numerous reports on the most diverse subjects, from the theory of colours to water-supply and from invalid chairs to mesmerism and the divining rod. The same year he obtained the position of *adjoint* to Baudon, one of the farmers-general of the revenue, subsequently becoming a full titular member of the body. This was the first of a series of posts in which his administrative abilities found full scope. Appointed *régisseur des poudres* in 1775, he not only abolished the vexatious search for saltpetre in the cellars of private houses, but increased the production of the salt and improved the manufacture of gunpowder. In 1785 he was nominated to the committee on agriculture, and as its secretary drew up reports and instructions on the cultivation of various crops, and promulgated schemes for the establishment of experimental agricultural stations, the distribution of agricultural implements and the adjustment of rights of pasturage. Seven years before he had started a model farm at Fréchine, where he demonstrated the advantages of scientific methods of cultivation and of the introduction of good breeds of cattle and sheep. Chosen a member of the provincial assembly of Orleans in 1787, he busied himself with plans for the improvement of the social and economic conditions of the community by means of savings banks, insurance societies, canals, workhouses, &c.; and he showed the sincerity of his philanthropical work by advancing money out of his own pocket, without interest, to the towns of Blois and Romorantin, for the purchase of barley during the famine of 1788. Attached in this same year to the *caisse d'escompte*, he presented the report of its operations to the national assembly in 1789, and as commissary of the treasury in 1791 he established a system of accounts of unexampled punctuality. He was also asked by the national assembly to draw up a new scheme of taxation in connexion with which he produced a report *De la richesse territoriale de la France*, and he was further associated with committees on hygiene, coinage, the casting of cannon, &c., and was secretary and treasurer of the commission appointed in 1790 to secure uniformity of weights and measures.

In 1791, when Lavoisier was in the middle of all this official activity, the suppression of the farmers-general marked the beginning of troubles which brought about his death. His membership of that body was alone sufficient to make him an object of suspicion; his administration at the *régie des poudres* was attacked; and Marat accused him in the *Ami du Peuple* of putting Paris in prison and of stopping the circulation of air in the city by the *mur d'octroi* erected at his suggestion in 1787. The Academy, of which as treasurer at the time he was a conspicuous member, was regarded by the convention with no friendly eyes as being tainted with "incivism," and in the spring of 1792 A. F. Fourcroy endeavoured to persuade it to purge itself of suspected members. The attempt was unsuccessful, but in August of the same year Lavoisier had to leave his house and laboratory at the Arsenal, and in November the Academy was forbidden until further orders to fill up the vacancies in its numbers. Next year, on the 1st of August, the convention passed a decree for the uniformity of weights and measures, and requested the Academy to take measures for carrying it out, but a week later Fourcroy persuaded the same convention to suppress the Academy together with other literary societies *patentées et dotées* by the nation. In November it ordered the arrest of the ex-farmers-general, and on the advice of the committee of public instruction, of which Guyton de Morveau and Fourcroy were members, the names of Lavoisier and others were struck off from the commission of weights and measures. The fate of the ex-farmers-general was sealed on the 2nd of May 1794, when, on the proposal of Antoine Dupin, one of their former officials, the convention sent them for trial by the Revolutionary tribunal. Within a week Lavoisier and 27 others were condemned to death. A petition in his favour addressed to Coffinhal, the president of the tribunal, is said to have been met with the reply *La République n'a pas besoin de savants*, and on the 8th of the month Lavoisier and his companions were guillotined at the Place de la Révolution. He died fourth, and was preceded by his colleague Jacques Paulze, whose daughter he had married in 1771. "*Il ne leur a fallu*," Lagrange remarked, "*qu'un moment pour faire tomber cette tête, et cent années peut-être ne suffiront pas pour en reproduire une semblable*."

Lavoisier's name is indissolubly associated with the overthrow of the phlogistic doctrine that had dominated the development of chemistry for over a century, and with the establishment of the foundations upon which the modern science reposes. "He discovered," says Justus von Liebig (*Letters on Chemistry*, No. 3), "no new body, no new property, no natural phenomenon previously unknown; but all the facts established by him were the necessary consequences of the labours of those who preceded him. His merit, his immortal glory, consists in this—that he infused into the body of the science a new spirit; but all the members of that body were already in existence, and rightly joined together." Realizing that the total weight of all the products of a chemical reaction must be exactly equal to the total weight of the reacting substances, he made the balance the *ultima ratio* of the laboratory, and he was able to draw correct inferences from his weighings because, unlike many of the phlogistonists, he looked upon heat as imponderable. It was by weighing that in 1770 he proved that water is not converted into earth by distillation, for he showed that the total weight of a sealed glass vessel and the water it contained remained constant, however long the water was boiled, but that the glass vessel lost weight to an extent equal to the weight of earth produced, his inference being that the earth came from the glass, not from the water. On the 1st of November 1772 he deposited with the Academy a sealed note which stated that sulphur and phosphorus when burnt increased in weight because they absorbed "air," while the metallic lead formed from litharge by reduction with charcoal weighed less than the original litharge because it had lost "air." The exact nature of the airs concerned in the processes he did not explain until after the preparation of "dephlogisticated air" (oxygen) by Priestley in 1774. Then, perceiving that in combustion and the calcination of metals only a portion of a given volume of common air was used up, he concluded that Priestley's new air, *air éminemment pur*, was what was absorbed by burning phosphorus, &c., "non-vital air," azote, or nitrogen remaining behind. The gas given off in the reduction of metallic calces by charcoal he at first supposed to be merely that contained in the calx, but he soon came to understand that it was a product formed by the union of the charcoal with the "dephlogisticated air" in the calx. In a memoir presented to the Academy in 1777, but not published till 1782, he assigned to dephlogisticated air the name oxygen, or "acid-producer," 296
on the supposition that all acids were formed by its union with a simple, usually non-metallic, body; and having verified this notion for phosphorus, sulphur, charcoal, &c., and even extended it to the vegetable acids, he naturally asked himself what was formed by the combustion of "inflammable air" (hydrogen). This problem he had attacked in 1774, and in subsequent years he made various attempts to discover the acid which, under the influence of his oxygen theory, he expected would be formed. It was not till the 25th of June 1783 that in conjunction with Laplace he announced to the Academy that water was the product formed by the combination of hydrogen and oxygen, but by that time he had been anticipated by Cavendish, to whose prior work, however, as to that of several other investigators in other matters, it is to be regretted that he did not render due acknowledgment. But a knowledge of the composition of water enabled him to storm the last defences of the phlogistonists. Hydrogen they held to be the phlogiston of metals, and they supported this view by pointing out that it was liberated when metals were dissolved in acids. Considerations of weight had long prevented Lavoisier from accepting this doctrine, but he was now able to explain the process fully, showing that the hydrogen evolved did not come from the metal itself, but was one product of the decomposition of the water of the dilute acid, the other product, oxygen, combining with the metal to form an oxide which in turn united with the acid. A little later this same knowledge led him to the beginnings of quantitative organic analysis. Knowing that the water produced by the combustion of alcohol was not pre-existent in that substance but was formed by the combination of its hydrogen with the oxygen of the air, he burnt alcohol and other combustible organic substances, such as wax and oil, in a known volume of oxygen, and, from the weight of the water and carbon dioxide produced and his knowledge of their composition, was able to calculate the amounts of carbon, hydrogen and oxygen present in the substance.

Up to about this time Lavoisier's work, mainly quantitative in character, had appealed most strongly to physicists, but it now began to win conviction from chemists also. C. L. Berthollet, L. B. Guyton de Morveau and A. F. Fourcroy, his collaborators in the reformed system of chemical terminology set forth in 1787 in the *Méthode de nomenclature chimique*, were among the earliest French converts, and they were followed by M. H. Klaproth and the German Academy, and by most English chemists except Cavendish, who rather suspended his judgment, and Priestley, who stubbornly clung to the opposite view. Indeed, though the partisans of phlogiston did not surrender without a struggle, the history of science scarcely presents a second instance of a change so fundamental accomplished with such ease. The spread of Lavoisier's doctrines was greatly facilitated by the defined and logical form in which he presented them in his *Traité élémentaire de chimie* (*présenté dans un ordre*

*nouveau et d'après les découvertes modernes*) (1789). The list of simple substances contained in the first volume of this work includes light and caloric with oxygen, azote and hydrogen. Under the head of "oxidable or acidifiable" substances, the combination of which with oxygen yielded acids, were placed sulphur, phosphorus, carbon, and the muriatic, fluoric and boracic radicals. The metals, which by combination with oxygen became oxides, were antimony, silver, arsenic, bismuth, cobalt, copper, tin, iron, manganese, mercury, molybdenum, nickel, gold, platinum, lead, tungsten and zinc; and the "simple earthy salifiable substances" were lime, baryta, magnesia, alumina and silica. The simple nature of the alkalies Lavoisier considered so doubtful that he did not class them as elements, which he conceived as substances which could not be further decomposed by any known process of analysis—*les molécules simples et indivisibles qui composent les corps*. The union of any two of the elements gave rise to binary compounds, such as oxides, acids, sulphides, &c. A substance containing three elements was a binary compound of the second order; thus salts, the most important compounds of this class, were formed by the union of acids and oxides, iron sulphate, for instance, being a compound of iron oxide with sulphuric acid.

In addition to his purely chemical work, Lavoisier, mostly in conjunction with Laplace, devoted considerable attention to physical problems, especially those connected with heat. The two carried out some of the earliest thermochemical investigations, devised apparatus for measuring linear and cubical expansions, and employed a modification of Joseph Black's ice calorimeter in a series of determinations of specific heats. Regarding heat (*matière de feu* or *fluide igné*) as a peculiar kind of imponderable matter, Lavoisier held that the three states of aggregation—solid, liquid and gas—were modes of matter, each depending on the amount of *matière de feu* with which the ponderable substances concerned were interpenetrated and combined; and this view enabled him correctly to anticipate that gases would be reduced to liquids and solids by the influence of cold and pressure. He also worked at fermentation, respiration and animal heat, looking upon the processes concerned as essentially chemical in nature. A paper discovered many years after his death showed that he had anticipated later thinkers in explaining the cyclical process of animal and vegetable life, for he pointed out that plants derive their food from the air, from water, and in general from the mineral kingdom, and animals in turn feed on plants or on other animals fed by plants, while the materials thus taken up by plants and animals are restored to the mineral kingdom by the breaking-down processes of fermentation, putrefaction and combustion.

A complete edition of the writings of Lavoisier, *Œuvres de Lavoisier, publiées par les soins du ministre de l'instruction publique*, was issued at Paris in six volumes from 1864-1893. This publication comprises his *Opuscules physiques et chimiques* (1774), many memoirs from the Academy volumes, and numerous letters, notes and reports relating to the various matters on which he was engaged. At the time of his death he was preparing an edition of his collected works, and the portions ready for the press were published in two volumes as *Mémoires de chimie* in 1805 by his widow (in that year married to Count Rumford), who had drawn and engraved the plates in his *Traité élémentaire de chimie* (1789).

Sec E. Grimaux, *Lavoisier 1743-1794, d'après sa correspondance, ses manuscripts*, &c. (1888), which gives a list of his works; P. E. M. Berthelot, *La Révolution chimique: Lavoisier* (1890), which contains an analysis of and extracts from his laboratory notebooks.

**LA VOISIN.** Catherine Monvoisin, known as "La Voisin" (d. 1680), French sorceress, whose maiden name was Catherine Deshayes, was one of the chief personages in the famous *affaire des poisons*, which disgraced the reign of Louis XIV. Her husband, Monvoisin, was an unsuccessful jeweller, and she practised chiromancy and face-reading to retrieve their fortunes. She gradually added the practice of witchcraft, in which she had the help of a renegade priest, Étienne Guibourg, whose part was the celebration of the "black mass," an abominable parody in which the host was compounded of the blood of a little child mixed with horrible ingredients. She practised medicine, especially midwifery, procured abortion and provided love powders and poisons. Her chief accomplice was one of her lovers, the magician Lesage, whose real name was Adam Cœuret. The great ladies of Paris flocked to La Voisin, who accumulated enormous wealth. Among her clients were Olympe Mancini, comtesse de Soissons, who sought the death of the king's mistress, Louise de la Vallière;

Mme de Montespan, Mme de Gramont (*la belle* Hamilton) and others. The bones of toads, the teeth of moles, cantharides, iron filings, human blood and human dust were among the ingredients of the love powders concocted by La Voisin. Her knowledge of poisons was not apparently so thorough as that of less well-known sorcerers, or it would be difficult to account for La Vallière's immunity. The art of poisoning had become a regular science. The death of Henrietta, duchess of Orleans, was attributed, falsely it is true, to poison, and the crimes of Marie Madeleine de Brinvilliers (executed in 1676) and her accomplices were still fresh in the public mind. In April 1679 a commission appointed to inquire into the subject and to prosecute the offenders met for the first time. Its proceedings, including some suppressed in the official records, are preserved in the notes of one of the official *rapporteurs*, Gabriel Nicolas de la Reynie. The revelation of the treacherous intention of Mme de Montespan to poison Louis XIV. and of other crimes, planned by personages who could not be attacked without scandal which touched the throne, caused Louis XIV. to close the *chambre ardente*, as the court was called, on the 1st of October 1680. It was reopened on the 19th of May 1681 and sat until the 21st of July 1682. Many of the culprits escaped through private influence. Among these were Marie Anne Mancini, duchesse de Bouillon, who had sought to get rid of her husband in order to marry the duke of Vendôme, though Louis XIV. banished her to Nérac. Mme de Montespan was not openly disgraced, because the preservation of Louis's own dignity was essential, and some hundred prisoners, among them the infamous Guibourg and Lesage, escaped the scaffold through the suppression of evidence insisted on by Louis XIV. and Louvois. Some of these were imprisoned in various fortresses, with instructions from Louvois to the respective commandants to flog them if they sought to impart what they knew. Some innocent persons were imprisoned for life because they had knowledge of the facts. La Voisin herself was executed at an early stage of the proceedings, on the 20th of February 1680, after a perfunctory application of torture. The authorities had every reason to avoid further revelations. Thirty-five other prisoners were executed; five were sent to the galleys and twenty-three were banished. Their crimes had furnished one of the most extraordinary trials known to history.



See F. Ravaisson, *Archives de la Bastille*, vols. iv.-vii. (1870-1874); the notes of La Reynie, preserved in the Bibliothèque Nationale; F. Funck-Brentano, *Le Drame des poisons* (1899); A. Masson, *La Sorcellerie et la science des poisons au XVII^e^ siècle* (1904). Sardou made the affair a background for his *Affaire des poisons* (1907). There is a portrait of La Voisin by Antoine Coypel, which has been often reproduced.

## LAW, JOHN

(1671-1729), Scots economist, best known as the originator of the "Mississippi scheme," was born at Edinburgh in April 1671. His father, a goldsmith and banker, bought shortly before his death, which took place in his son's youth, the lands of Lauriston near Edinburgh. John lived at home till he was twenty, and then went to London. He had already studied mathematics, and the theory of commerce and political economy, with much interest; but he was known rather as fop than scholar. In London he gambled, drank and flirted till in April 1694 a love intrigue resulted in a duel with Beau Wilson in Bloomsbury Square. Law killed his antagonist, and was condemned to death. His life was spared, but he was detained in prison. He found means to escape to Holland, then the greatest commercial country in Europe. Here he observed with close attention the practical working of banking and financial business, and conceived the first ideas of his celebrated "system." After a few years spent in foreign travel, he returned to Scotland, then exhausted and enraged by the failure of the Darien expedition (1695-1701). He propounded plans for the relief of his country in a work[1] entitled *Money and Trade Considered, with a Proposal for supplying the Nation with Money* (1705). This attracted some notice, but had no practical effect, and Law again betook himself to travel. He visited Brussels, Paris, Vienna, Genoa, Rome, making large sums by gambling and speculation, and spending them lavishly. He was in Paris in 1708, and made some proposals to the government as to their financial difficulties, but Louis XIV. declined to treat with a "Huguenot," and d'Argenson, chief of the police, had Law expelled as a suspicious character. He had, however, become intimately acquainted with the duke of Orleans, and when in 1715 that prince became regent, Law at once returned to Paris.

The extravagant expenditure of the late monarch had plunged the kingdom into apparently inextricable financial confusion. The debt was 3000 million livres, the estimated annual expenditure, exclusive of interest payments, 148 million livres, and the income about the same. The advisability of declaring a national bankruptcy was seriously discussed, and though this plan was rejected, measures hardly less violent were carried. By a *visa*, or examination of the state liabilities by a committee with full powers of quashing claims, the debt was reduced nearly a half, the coin in circulation was ordered to be called in and reissued at the rate of 120 for 100—a measure by which foreign coiners profited greatly, and a chamber of justice was established to punish speculators, to whom the difficulties of the state were ascribed. These measures had so little success that the *billets d'état* which were issued as part security for the new debt at once sank 75% below their nominal value. At this crisis Law unfolded a vast scheme to the perplexed regent. A royal bank was to manage the trade and currency of the kingdom, to collect the taxes, and to free the country from debt. The council of finance, then under the duc de Noailles, opposed the plan, but the regent allowed Law to take some tentative steps. By an edict of 2nd May 1716, a private institution called *La Banque générale*, and managed by Law, was founded. The capital was 6 million livres, divided into 1200 shares of 5000 livres, payable in four instalments, one-fourth in cash, three-fourths in *billets d'état*. It was to perform the ordinary functions of a bank, and had power to issue notes payable at sight in the weight and value of the money mentioned at day of issue. The bank was a great and immediate success. By providing for the absorption of part of the state paper it raised the credit of the government. The notes were a most desirable medium of exchange, for they had the element of fixity of value, which, owing to the arbitrary mint decrees of the government, was wanting in the coin of the realm. They proved the most convenient instruments of remittance between the capital and the provinces, and they thus developed the industries of the latter. The rate of interest, previously enormous and uncertain, fell first to 6 and then to 4%; and when another decree (10th April 1717) ordered collectors of taxes to receive notes as payments, and to change them for coin at request, the bank so rose in favour that it soon had a note-issue of 60 million livres. Law now gained the full confidence of the regent, and was allowed to proceed with the development of the "system."

The trade of the region about the Mississippi had been granted to a speculator named Crozat. He found the undertaking too large, and was glad to give it up. By a decree of August 1717 Law was allowed to establish the *Compagnie de la Louisiane ou d'Occident*, and to endow it with privileges practically amounting to sovereignty over the most fertile region of North America. The capital was 100 million livres divided into 200,000 shares of 500 livres. The payments were to be one-fourth in coin and three-fourths in *billets d'état*. On these last the government was to pay 3 million livres interest yearly to the company. As the state paper was depreciated the shares fell much below par. The rapid rise of Law had made him many enemies, and they took advantage of this to attack the system. D'Argenson, now head of the council of finance, with the brothers Paris of Grenoble, famous tax farmers of the day, formed what was called the "anti-system." The farming of the taxes was let to them, under an assumed name, for 48½ million livres yearly. A company was formed, the exact counterpart of the Mississippi company. The capital was the same, divided in the same manner, but the payments were to be entirely in money. The returns from the public revenue were sure; those from the Mississippi scheme were not. Hence the shares of the latter were for some time out of favour. Law proceeded unmoved with the development of his plans. On the 4th of December 1718 the bank became a government institution under the name of *La Banque royale*. Law was director, and the king guaranteed the notes. The shareholders were repaid in coin, and, to widen the influence of the new institution, the transport of money between towns where it had branches was forbidden. The paper-issue now reached 110 millions. Law had such confidence in the success of his plans that he agreed to take over shares in the Mississippi company at par at a near date. The shares began rapidly to rise. The next move was to unite the companies *Des Indes Orientales* and *De Chine*, founded in 1664 and 1713 respectively, but now dwindled away to a shadow, to his company. The united association, *La Compagnie des Indes*, had a practical monopoly of the foreign trade of France. These proceedings necessitated the creation of new capital to the nominal amount of 25 million livres. The payment was spread over 20 months. Every holder of four original shares (*mères*) could purchase one of the new shares (*filles*) at a premium of 50 livres. All these 500-livre shares rapidly rose to 750, or 50% above par. Law now turned his attention to obtaining additional powers within France itself. On the 25th of July 1719 an edict was issued granting the company for nine years the management of the mint and the coin-issue. For this privilege the company paid 5 million livres, and the money was raised by a new issue of shares of the nominal value of 500 livres, but with a premium of other 500. The list was only open for twenty days, and it was necessary to present four

*mères* and one *fille* in order to obtain one of the new shares (*petites filles*). At the same time two dividends per annum of 6% each were promised. Again there was an attempt to ruin the bank by the commonplace expedient of making a run on it for coin; but the conspirators had to meet absolute power managed with fearlessness and skill. An edict appeared reducing, at a given date, the value of money, and those who had withdrawn coin from the bank hastened again to exchange it for the more stable notes. Public confidence in Law was increased, and he was enabled rapidly to proceed with the completion of the system. A decree of 27th August 1719 deprived the rival company of the farming of the revenue, and gave it to the *Compagnie des Indes* for nine years in return for an annual payment of 52 million livres. Thus at one blow the “anti-system” was crushed. One thing yet remained; Law proposed to take over the national debt, and manage it on terms advantageous to the state. The mode of transfer was this. The debt was over 1500 million livres. Notes were to be issued to that amount, and with these the state creditors must be paid in a certain order. Shares were to be issued at intervals corresponding to the payments, and it was expected that the notes would be used in buying them. The government was to pay 3% for the loan. It had formerly been bound to pay 80 millions, it would now pay under 50, a clear gain of over 30. As the shares of the company were almost the only medium for investment, the transfer would be surely effected. The creditors would now look to the government payments and the commercial gains of the company for their annual returns. Indeed the creditors were often not able to procure the shares, for each succeeding issue was immediately seized upon, though the 500-livre share was now issued at a premium of 4500 livres. After the third issue, on the 2nd of October, the shares immediately resold at 8000 livres in the Rue Quincampoix, then used as a bourse. They went on rapidly rising as new privileges were still granted to the company. Law had now more than regal power. The exiled Stuarts paid him court; the proudest aristocracy in Europe humbled themselves before him; and his liberality made him the idol of the populace. After, as a necessary preliminary, becoming a Catholic, he was made controller-general of the finances in place of d’Argenson. Finally, in February 1720, the bank was in name as well as in reality united to the company.

The system was now complete; but it had already begun to decay. In December 1719 it was at its height. The shares had then amounted to 20,000 livres, forty times their nominal price. A sort of madness possessed the nation. Men sold their all and hastened to Paris to speculate. The population of the capital was increased by an enormous influx of provincials and foreigners. Trade received a vast though unnatural impulse. Everybody seemed to be getting richer, no one poorer. Those who could still reflect saw that this prosperity was not real. The whole issue of shares at the extreme market-price valued 12,000 million livres. It would require 600 million annual revenue to give a 5% dividend on this. Now, the whole income of the company as yet was hardly sufficient to pay 5% on the original capital of 1677 million livres. The receipts from the taxes, &c., could be precisely calculated, and it would be many years before the commercial undertakings of the company—with which only some trifling beginning had been made—would yield any considerable return. People began to sell their shares, and to buy coin, houses, land—anything that had a stable element of value in it. There was a rapid fall in the shares, a rapid rise in all kinds of property, and consequently a rapid depreciation of the paper money. Law met these new tendencies by a succession of the most violent edicts. The notes were to bear a premium over specie. Coin was only to be used in small payments, and only a small amount was to be kept in the possession of private parties. The use of diamonds, the fabrication of gold and silver plate, was forbidden. A dividend of 40% on the original capital was promised. By several ingenious but fallaciously reasoned pamphlets Law endeavoured to restore public confidence. The shares still fell. At last, on the 5th of March 1720, an edict appeared fixing their price at 9000 livres, and ordering the bank to buy and sell them at that price. The fall now was transferred to the notes, of which there were soon over 2500 million livres in circulation. A large proportion of the coined money was removed from the kingdom. Prices rose enormously. There was everywhere distress and complete financial confusion. Law became an object of popular hatred. He lost his court influence, and was obliged to consent to a decree (21st May 1720) by which the notes and consequently the shares were reduced to half their nominal value. This created such a commotion that its promoters were forced to recall it, but the mischief was done. What confidence could there be in the depreciated paper after such a measure? Law was removed from his office, and his enemies proceeded to demolish the “system.” A vast number of shares had been deposited in the bank. These were destroyed. The notes were reconverted into government debt, but there was first a *visa* which reduced that debt to the same size as before it was taken over by the company. The rate of interest was lowered, and the government now only pledged itself to pay 37 instead of 80 millions annually. Finally the bank was abolished, and the company reduced to a mere trading association. By November the “system” had disappeared. With these last measures Law, it

may well be believed, had nothing to do. He left France secretly in December 1720, resumed his wandering life, and died at Venice, poor and forgotten, on the 21st of March 1729.

Of Law's writings the most important for the comprehension of the "system" is his *Money and Trade Considered*. In this work he says that national power and wealth consist in numbers of people, and magazines of home and foreign goods. These depend on trade, and that on money, of which a greater quantity employs more people; but credit, if the credit have a circulation, has all the beneficial effects of money. To create and increase instruments of credit is the function of a bank. Let such be created then, and let its notes be only given in return for land sold or pledged. Such a currency would supply the nation with abundance of money; and it would have many advantages, which Law points out in detail, over silver. The bank or commission was to be a government institution, and its profits were to be spent in encouraging the export and manufacture of the nation. A very evident error lies at the root of the "system." Money is not the result but the cause of wealth, he thought. To increase it then must be beneficial, and the best way is by a properly secured paper currency. This is the motive force; but it is to be applied in a particular way. Law had a profound belief in the omnipotence of government. He saw the evils of minor monopolies, and of private farming of taxes. He proposed to centre foreign trade and internal finance in one huge monopoly managed by the state for the people, and carrying on business through a plentiful supply of paper money. He did not see that trade and commerce are best left to private enterprise, and that such a scheme would simply result in the profits of speculators and favourites. The "system" was never so far developed as to exhibit its inherent faults. The madness of speculators ruined the plan when only its foundations were laid. One part indeed might have been saved. The bank was not necessarily bound to the company, and had its note-issue been retrenched it might have become a permanent institution. As Thiers points 299
out, the edict of the 5th of March 1720, which made the shares convertible into notes, ruined the bank without saving the company. The shares had risen to an unnatural height, and they should have been allowed to fall to their natural level. Perhaps Law felt this to be impossible. He had friends at court whose interests were involved in the shares, and he had enemies eager for his overthrow. It was necessary to succeed completely or not at all; so Law, a gambler to the core, risked and lost everything. Notwithstanding the faults of the "system," its author was a financial genius of the first order. He had the errors of his time; but he propounded many truths as to the nature of currency and banking then unknown to his contemporaries. The marvellous skill which he displayed in adapting the theory of the "system" to the actual condition of things in France, and in carrying out the various financial transactions rendered necessary by its development, is absolutely without parallel. His profound self-confidence and belief in the truth of his own theories were the reasons alike of his success and his ruin. He never hesitated to employ the whole force of a despotic government for the definite ends which he saw before him. He left France poorer than he entered it, yet he was not perceptibly changed by his sudden transitions of fortune. Montesquieu visited him at Venice after his fall, and has left a description of him touched with a certain pathos. Law, he tells us, was still the same in character, perpetually planning and scheming, and, though in poverty, revolving vast projects to restore himself to power, and France to commercial prosperity.

The fullest account of the Mississippi scheme is that of Thiers, *Law et son système des finances* (1826, American trans. 1859). See also Heymann, *Law und sein System* (1853); Pierre Bonnassieux, *Les Grandes Compagnies de commerce* (1892); S. Alexi, *John Law und sein System* (1885); E. Levasseur, *Récherches historiques sur le système de Law* (1854); and Jobez, *Une Préface au socialisme, ou le système de Law et la chasse aux capitalistes* (1848). Full biographical details are given in Wood's *Life of Law* (Edinburgh, 1824). All Law's later writings are to be found in Daire, *Collection des principaux économistes*, vol. i. (1843). Other works on Law are: A. W. Wiston-Glynn, *John Law of Lauriston* (1908); P. A. Cachut, *The Financier Law, his Scheme and Times* (1856); A. Macf. Davis, *An Historical Study of Law's System* (Boston, 1887); A. Beljame, *La Pronunciation du nom de Jean Law le financier* (1891). See also E. A. Benians in *Camb. Mod. Hist.* vi. 6 (1909). For minor notices see Poole's *Index to Periodicals*. There is a portrait of Law by A. S. Belle in the National Portrait Gallery, London.

(F. Wa.)

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1 A work entitled *Proposals and Reasons for constituting a Council of Trade in Scotland* was published anonymously at Edinburgh in 1701. It was republished at Glasgow in 1751 with Law's name attached; but several references in the state papers of the time mention William Paterson (1658-1719), founder of the Bank of England, as the author of the plan therein propounded. Even if Law had nothing to do with the composition of the work, he must have read it and been influenced by it. This may explain how it contains the germs of many of the developments of the "system." Certainly the suggestion of a central board, to manage great commercial undertakings, to furnish occupation for the poor, to encourage mining, fishing and manufactures, and to bring about a reduction in the rate of interest, was largely realized in the Mississippi scheme. See

Bannister's Life of William Paterson (ed. 1858), and *Writings of William Paterson* (2nd ed., 3 vols., 1859).

**LAW, WILLIAM** (1686-1761), English divine, was born at King's Cliffe, Northamptonshire. In 1705 he entered as a sizar at Emmanuel College, Cambridge; in 1711 he was elected fellow of his college and was ordained. He resided at Cambridge, teaching and taking occasional duty until the accession of George I., when his conscience forbade him to take the oaths of allegiance to the new government and of abjuration of the Stuarts. His Jacobitism had already been betrayed in a tripos speech which brought him into trouble; and he was now deprived of his fellowship and became a non-juror. For the next few years he is said to have been a curate in London. By 1727 he was domiciled with Edward Gibbon (1666-1736) at Putney as tutor to his son Edward, father of the historian, who says that Law became "the much honoured friend and spiritual director of the whole family." In the same year he accompanied his pupil to Cambridge, and resided with him as governor, in term time, for the next four years. His pupil then went abroad, but Law was left at Putney, where he remained in Gibbon's house for more than ten years, acting as a religious guide not only to the family but to a number of earnest-minded folk who came to consult him. The most eminent of these were the two brothers John and Charles Wesley, John Byrom the poet, George Cheyne the physician and Archibald Hutcheson, M.P. for Hastings. The household was dispersed in 1737. Law was parted from his friends, and in 1740 retired to King's Cliffe, where he had inherited from his father a house and a small property. There he was presently joined by two ladies: Mrs Hutcheson, the rich widow of his old friend, who recommended her on his death-bed to place herself under Law's spiritual guidance, and Miss Hester Gibbon, sister to his late pupil. This curious trio lived for twenty-one years a life wholly given to devotion, study and charity, until the death of Law on the 9th of April 1761.

Law was a busy writer under three heads:—

1. *Controversy.*—In this field he had no contemporary peer save perhaps Richard Bentley. The first of his controversial works was *Three Letters to the Bishop of Bangor* (1717), which were considered by friend and foe alike as one of the most powerful contributions to the Bangorian controversy on the high church side. Thomas Sherlock declared that "Mr Law was a writer so considerable that he knew but one good reason why his lordship did not answer him." Law's next controversial work was *Remarks on Mandeville's Fable of the Bees* (1723), in which he vindicates morality on the highest grounds; for pure style, caustic wit and lucid argument this work is remarkable; it was enthusiastically praised by John Sterling, and republished by F. D. Maurice. Law's *Case of Reason* (1732), in answer to Tindal's *Christianity as old as the Creation* is to a great extent an anticipation of Bishop Butler's famous argument in the *Analogy*. In this work Law shows himself at least the equal of the ablest champion of Deism. His *Letters to a Lady inclined to enter the Church of Rome* are excellent specimens of the attitude of a high Anglican towards Romanism. His controversial writings have not received due recognition, partly because they were opposed to the drift of his times, partly because of his success in other fields.

2. *Practical Divinity.*—The *Serious Call to a Devout and Holy Life* (1728), together with its predecessor, *A Treatise of Christian Perfection* (1726), deeply influenced the chief actors in the great Evangelical revival. The Wesleys, George Whitefield, Henry Venn, Thomas Scott and Thomas Adam all express their deep obligation to the author. The *Serious Call* affected others quite as deeply. Samuel Johnson, Gibbon, Lord Lyttelton and Bishop Horne all spoke enthusiastically of its merits; and it is still the only work by which its author is popularly known. It has high merits of style, being lucid and pointed to a degree. In a tract entitled *The Absolute Unlawfulness of Stage Entertainments* (1726) Law was tempted by the corruptions of the stage of the period to use unreasonable language, and incurred some effective criticism from John Dennis in *The Stage Defended*.

3. *Mysticism.*—Though the least popular, by far the most interesting, original and suggestive of all Law's works are those which he wrote in his later years, after he had become an enthusiastic admirer (not a disciple) of Jacob Boehme, the Teutonic theosophist. From his earliest years he had been deeply impressed with the piety, beauty and thoughtfulness of the writings of the Christian mystics, but it was not till after his accidental meeting with the works of Boehme, about 1734, that pronounced mysticism appeared in his

works. Law's mystic tendencies divorced him from the practical-minded Wesley, but in spite of occasional wild fancies the books are worth reading. They are *A Demonstration of the Gross and Fundamental Errors of a late Book called a "Plain Account, &c., of the Lord's Supper"* (1737); *The Grounds and Reasons of the Christian Regeneration* (1739); *An Appeal to all that Doubt and Disbelieve the Truths of Revelation* (1740); *An Earnest and Serious Answer to Dr Trapp's Sermon on being Righteous Overmuch* (1740); *The Spirit of Prayer* (1749, 1752); *The Way to Divine Knowledge* (1752); *The Spirit of Love* (1752, 1754); *A Short but Sufficient Confutation of Dr Warburton's Projected Defence* (*as he calls it*) *of Christianity in his "Divine Legation of Moses"* (1757); *A Series of Letters* (1760); a *Dialogue between a Methodist and a Churchman* (1760); and *An Humble, Earnest and Affectionate Address to the Clergy* (1761).

Richard Tighe wrote a short account of Law's life in 1813. See also Christopher Walton, *Notes and Materials for a Complete Biography of W. Law* (1848); Sir Leslie Stephen, *English Thought in the 18th century*, and in the *Dict. Nat. Biog.* (xxxii. 236); W. H. Lecky, *History of England in the 18th Century*; C. J. Abbey, *The English Church in the 18th Century*; and J. H. Overton, *William Law, Nonjuror and Mystic* (1881).

LAW (O. Eng. *lagu*, M. Eng. *lawe*; from an old Teutonic root *lag*, "lie," what lies fixed or evenly; cf. Lat. *lex*, Fr. *loi*), a word used in English in two main senses—(1) as a rule prescribed by authority for human action, and (2) in scientific and philosophic phraseology, as a uniform order of sequence (*e.g.* "laws" of motion). In the first sense the word is used either in the abstract, for jurisprudence generally or for a state of things in which the laws of a country are duly observed ("law and order"), or in the concrete for some particular rule or body of rules. It is usual to distinguish further between "law" and "equity" (*q.v.*). The scientific and philosophic usage has grown out of an early conception of jurisprudence, and is really metaphorical, derived from the phrase "natural law" or "law of nature," which presumed that commands were laid on matter by God (see T. E. Holland, *Elements of Jurisprudence*, ch. ii.). The adjective "legal" is only used in the first sense, never in the second. In the case of the "moral law" (see Ethics) the term is employed somewhat ambiguously because of its connexion with both meanings. There is also an Old English use of the word "law" in a more or less sporting sense ("to give law" or "allow so much law"), meaning a start or fair allowance in time or distance. Presumably this originated simply in the liberty-loving Briton's respect for proper legal procedure; instead of the brute exercise of tyrannous force he demanded "law," or a fair opportunity and trial. But it may simply be an extension of the meaning of "right," or of the sense of "leave" which is found in early uses of the French *loi*.



In this work the laws or uniformities of the physical universe are dealt with in the articles on the various sciences. The general principles of law in the legal sense are discussed under Jurisprudence. What may be described as "national systems" of law are dealt with historically and generally under English Law, American Law, Roman Law, Greek Law, Mahommedan Law, Indian Law, &c. Certain broad divisions of law are treated under Constitution and Constitutional Law, Canon Law, Civil Law, Common Law, Criminal Law, Ecclesiastical Law, Equity, International Law, Military Law, &c. And the particular laws of different countries on special subjects are stated under the headings for those subjects (Bankruptcy, &c.). For courts (*q.v.*) of law, and procedure, see Jurisprudence, Appeal, Trial, King's Bench, &c.

Authorities.—The various legal articles have bibliographies attached, but it may be convenient here to mention such general works on law, apart from the science of jurisprudence, as (for English law) Lord Halsbury's *Laws of England* (vol. i., 1907), *The Encyclopaedia of the Laws of England*, ed. Wood Renton (1907), Stephen's *Commentaries on the Laws of England* (1908), Brett's *Commentaries on the present Laws of England* (1896), Broom's *Commentaries on the Common Law* (1896) and Brodie-Innes's *Comparative Principles of the Laws of England and Scotland* (vol. i., 1903); and, for America, Bouvier's *Law Dictionary*, and Kent's *Commentaries on American Law*.

**LAWES, HENRY** (1595-1662), English musician, was born at Dinton in Wiltshire in December 1595, and received his musical education from John Cooper, better known under his Italian pseudonym Giovanni Coperario (d. 1627), a famous composer of the day. In 1626 he was received as one of the gentlemen of the chapel royal, which place he held till the Commonwealth put a stop to church music. But even during that songless time Lawes continued his work as a composer, and the famous collection of his vocal pieces, *Ayres and Dialogues for One, Two and Three Voyces*, was published in 1653, being followed by two other books under the same title in 1655 and 1658 respectively. When in 1660 the king returned, Lawes once more entered the royal chapel, and composed an anthem for the coronation of Charles II. He died on the 21st of October 1662, and was buried in Westminster Abbey. Lawes's name has become known beyond musical circles by his friendship with Milton, whose *Comus* he supplied with incidental music for the performance of the masque in 1634. The poet in return immortalized his friend in the famous sonnet in which Milton, with a musical perception not common amongst poets, exactly indicates the great merit of Lawes. His careful attention to the words of the poet, the manner in which his music seems to grow from those words, the perfect coincidence of the musical with the metrical accent, all put Lawes's songs on a level with those of Schumann or Liszt or any modern composer. At the same time he is by no means wanting in genuine melodic invention, and his concerted music shows the learned contrapuntist.

**LAWES, SIR JOHN BENNET,** Bart. (1814-1900), English agriculturist, was born at Rothamsted on the 28th of December 1814. Even before leaving Oxford, where he matriculated in 1832, he had begun to interest himself in growing various medicinal plants on the Rothamsted estates, which he inherited on his father's death in 1822. About 1837 he began to experiment on the effects of various manures on plants growing in pots, and a year or two later the experiments were extended to crops in the field. One immediate consequence was that in 1842 he patented a manure formed by treating phosphates with sulphuric acid, and thus initiated the artificial manure industry. In the succeeding year he enlisted the services of Sir J. H. Gilbert, with whom he carried on for more than half a century those experiments in raising crops and feeding animals which have rendered Rothamsted famous in the eyes of scientific agriculturists all over the world (see Agriculture). In 1854 he was elected a Fellow of the Royal Society, which in 1867 bestowed a Royal medal on Lawes and Gilbert jointly, and in 1882 he was created a baronet. In the year before his death, which happened on the 31st of August 1900, he took measures to ensure the continued existence of the Rothamsted experimental farm by setting aside £100,000 for that purpose and constituting the Lawes Agricultural Trust, composed of four members from the Royal Society, two from the Royal Agricultural Society, one each from the Chemical and Linnaean Societies, and the owner of Rothamsted mansion-house for the time being.

**LAW MERCHANT** or Lex mercatoria, originally a body of rules and principles relating to merchants and mercantile transactions, laid down by merchants themselves for the purpose of regulating their dealings. It was composed of such usages and customs as were common to merchants and traders in all parts of Europe, varied slightly in different localities by special peculiarities. The law merchant owed its origin to the fact that the civil law was not sufficiently responsive to the growing demands of commerce, as well as to the fact that trade in pre-medieval times was practically in the hands of those who might be termed cosmopolitan merchants, who wanted a prompt and effective jurisdiction. It was

administered for the most part in special courts, such as those of the gilds in Italy, or the fair courts of Germany and France, or as in England, in courts of the staple or piepowder (see also Sea Laws). The history of the law merchant in England is divided into three stages: the first prior to the time of Coke, when it was a special kind of law—as distinct from the common law—administered in special courts for a special class of the community (*i.e.* the mercantile); the second stage was one of transition, the law merchant being administered in the common law courts, but as a body of customs, to be proved as a fact in each individual case of doubt; the third stage, which has continued to the present day, dates from the presidency over the king's bench of Lord Mansfield (*q.v.*), under whom it was moulded into the mercantile law of to-day. To the law merchant modern English law owes the fundamental principles in the law of partnership, negotiable instruments and trade marks.

See G. Malynes, *Consuetudo vel lex mercatoria* (London, 1622); W. Mitchell, *The Early History of the Law Merchant* (Cambridge, 1904); J. W. Smith, *Mercantile Law* (ed. Hart and Simey, 1905).

LAWN, a very thin fabric made from level linen or cotton yarns. It is used for light dresses and trimmings, also for handkerchiefs. The terms lawn and cambric (*q.v.*) are often intended to indicate the same fabric. The word "lawn" was formerly derived from the French name for the fabric *linon*, from *lin*, flax, linen, but Skeat (*Etym. Dict.*, 1898, Addenda) and A. Thomas (*Romania*, xxix. 182, 1900) have shown that the real source of the word is to be found in the name of the French town Laon. Skeat quotes from Palsgrave, *Les claircissement de la langue Françoÿse* (1530), showing that the early name of the fabric was *Laune lynen*. An early form of the word was "laund," probably due to an adaptation to "laund," lawn, glade or clearing in a forest, now used of a closely-mown expanse of grass in a garden, park, &c. (see Grass and Horticulture). This word comes from O. Fr. *launde*, mod. *lande*, wild, heathy or sandy ground, covered with scrub or brushwood, a word of Celtic origin; cf. Irish and Breton *lann*, heathy ground, also enclosure, land; Welsh *llan*, enclosure. It is cognate with "land," common to Teutonic languages. In the original sense of clearing in a forest, glade, Lat. *saltus*, "lawn," still survives in the New Forest, where it is used of the feeding-places of cattle.

LAWN-TENNIS, a game played with racquet and ball on a court traversed by a net, but without enclosing walls. It is a modern adaptation of the ancient game of tennis (*q.v.*), with which it is identical as regards the scoring of the game and "set." Lawn-tennis is essentially a summer game, played in the open air, either on courts marked with whitewash on close-cut grass like a cricket pitch, or on asphalt, cinders, gravel, wood, earth or other substance which can be so prepared as to afford a firm, level and smooth surface. In winter, however, the game is often played on the floor of gymnasiums, drill sheds or other buildings, when it is called "covered-court lawn-tennis"; but there is no difference in the game itself corresponding to these varieties of court.

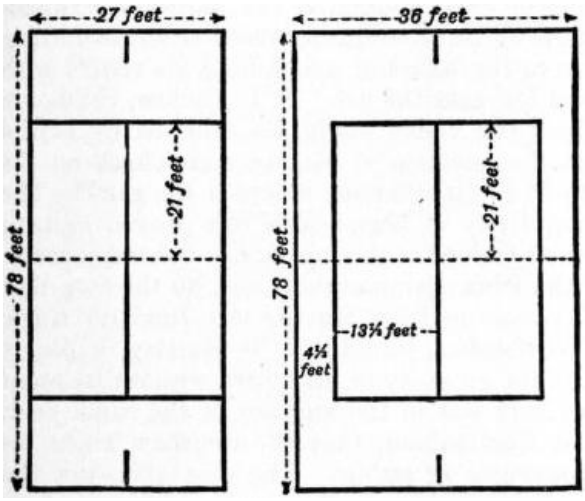



FIG. 1.




FIG. 2.

The lawn-tennis court for the single-handed game, one player against one (“singles”), is shown in fig. 1, and that for the four-handed game (“doubles”) in fig. 2. The net stretched across the middle of the court is attached to the tops of two posts which stand 3 ft. outside the court on each side. The height of the net is 3 ft. 6 in. at the posts and 3 ft. at the centre. The court is bisected longitudinally by the half-court-line, which, however, is marked only between the two service-lines and at the points of junction with the base-lines. The divisions of the court on each side of the half-court-line are called respectively the right-hand and left-hand courts; and the portion of these divisions between the service-lines and the net are the right-hand service-court and left-hand service-court respectively. The balls, which are made of hollow india-rubber, tightly covered with white flannel, are 2½ in. in diameter, and from 1⅞ to 2 oz. in weight. The racquets (fig. 3), for which there are no regulation dimensions, are broader and lighter than those used in tennis.

FIG. 3.

Before play begins, a racquet is spun as in tennis, and the winner of the spin elects either to take first service or to take choice of courts. If he takes choice of courts, he and his partner (if the game be doubles) take their position on the selected side of the net, one stationing himself in the right-hand court and the other in the left, which positions are retained throughout the set. If the winner of the spin takes choice of courts, his opponent has first service; and vice versa. The players change sides of the net at the end of the first, third and every subsequent alternate game, and at the end of each set; but they may agree not to change during any set except the last. Service is delivered by each player in turn, who retains it for one game irrespective of the winning or losing of points. In doubles the partner of the server in the first game serves in the third, and the partner of the server in the second game serves in the fourth; the same order being preserved till the end of the set; but each pair of partners decide for themselves before their first turn of service which of the two shall serve first. The server delivers the service from the right- and left-hand courts alternately, beginning in each of his service games from the right-hand court, even though odds be given or owed; he must stand behind (*i.e.* farther from the net than) the base-line, and must serve the ball so that it drops in the opponent’s service-court diagonally opposite to the court served from, or upon one of the lines enclosing that service-court. If in a serve, otherwise good, the ball touches the net, it is a “let” whether the serve be “taken” or not by striker-out; a “let” does not annul a previous “fault.” (For the meaning of “let,” “rest,” “striker-out” and other technical terms used in the game, see TENNIS and RACQUETS.) The serve is a fault (1) if it be not delivered by the server from the proper court, and from behind the base-line; (2) if the ball drops into the net or out-of-court, or into any part of the court other than the proper service-court. The striker-out cannot, as in racquets, “take,” and thereby condone, a fault. When a fault has been served, the server must serve again from the same court, unless it was a fault because served from the wrong court, in which case the server crosses to the proper court before serving again. Two consecutive faults score a point against the side of the server. Lawn-tennis differs from

tennis and racquets in that the service may not be taken on the volley by striker-out. After the serve has been returned the play proceeds until the “rest” (or “rally”) ends by one side or the other failing to make a “good return”; a good return in lawn-tennis meaning a stroke by which the ball, having been hit with the racquet before its second bound, is sent over the net, even if it touches the net, so as to fall within the limits of the court on the opposite side. A point is scored by the player, or side, whose opponent fails to return the serve or to make a good return in the rest. A player also loses a point if the ball when in play touches him or his partner, or their clothes; or if he or his racquet touches the net or any of its supports while the ball is in play; or if he leaps over the net to avoid touching it; or if he volley the ball before it has passed the net.

For him who would excel in lawn-tennis a strong fast service is hardly less necessary than a heavily “cut” service to the tennis player and the racquet player. High overhand service, by which alone any great pace can be obtained, was first perfected by the brothers Renshaw between 1880 and 1890, and is now universal even among players far below the first rank. The service in vogue among the best players in America, and from this circumstance known as the “American service,” has less pace than the English but is “cut” in such a way that it swerves in the air and “drags” off the ground, the advantage being that it gives the server more time to “run in” after his serve, so as to volley his opponent’s return from a position within a yard or two of the net. Both in singles and doubles the best players often make it their aim to get up comparatively near the net as soon as possible, whether they are serving or receiving the serve, the object being to volley the ball whenever possible before it begins to fall. The server’s partner, in doubles, stands about a yard and a half from the net, and rather nearer the side-line than the half-court-line; the receiver of the service, not being allowed to volley the serve, must take his stand according to the nature of the service, which, if very fast, will require him to stand outside the base-line; the receiver’s partner usually stands between the net and the service-line. All four players, if the rest lasts beyond a stroke or two, are generally found nearer to the net than the service-lines; and the game, assuming the players to be of the championship class, consists chiefly of rapid low volleying, varied by attempts on one side or the other to place the ball out of the opponents’ reach by “lobbing” it over their heads into the back part of the court. Good “lobbing” demands great skill, to avoid on the one hand sending the ball out of court beyond the base-line, and on the other allowing it to drop short enough for the adversary to kill it with a “smashing” volley. Of “lobbing” it has been laid down by the brothers Doherty that “the higher it is the better, so long as the length is good”; and as regards returning lobs the same authorities say, “you must get them if you can before they drop, for it is usually fatal to let them drop when playing against a good pair.” The reason for this is that if the lob be allowed to drop before being returned, so much time is given to the striker of it to gain position that he is almost certain to be able to kill the return, unless the lob be returned by an equally good and very high lob, dropping within a foot or so of the base-line in the opposite court, a stroke that requires the utmost accuracy of strength to accomplish safely. The game in the hands of first-class players consists largely in manœuvring for favourable position in the court while driving the opponent into a less favourable position on his side of the net; the player who gains the advantage of position in this way being generally able to finish the rest by a smashing volley impossible to return. Ability to play this “smash” stroke is essential to strong lawn-tennis. “To be good overhead,” say the Dohertys, “is the sign of a first-class player, even if a few have managed to get on without it.” The smash stroke is played very much in the same way as the overhand service, except that it is not from a defined position of known distance from the net; and therefore when making it the player must realize almost instinctively what his precise position is in relation to the net and the side-lines, for it is of the last importance that he should not take his eye off the ball “even for the hundredth part of a second.” By drawing the racquet across the ball at the moment of impact spin may be imparted to it as in tennis, or as “side” is imparted to a billiard ball, and the direction of this spin and the consequent behaviour of the ball after the stroke may be greatly varied by a skilful player. Perhaps the most generally useful form of spin, though by no means the only one commonly used, is that known as “top” or “lift,” a vertical rotatory motion of the ball in the same direction as its flight, which is imparted to it by an upward draw of the racquet at the moment of making the stroke, and the effect of which is to make it drop more suddenly than it would ordinarily do, and in an unexpected curve. A drive made with plenty of “top” can be hit much harder than would otherwise be possible without sending the ball out of court, and it is therefore extensively employed by the best players. While the volleying game is almost universally the practice of first-class players—A. W. Gore, M. J. G. Ritchie and S. H. Smith being almost alone among those of championship rank in modern days to use the volley comparatively little—its difficulty places it beyond the reach of the less skilful. In lawn-tennis as played at the ordinary country house or local club the real “smash” of a Renshaw or a Doherty is seldom to be seen, and the high lob is almost equally rare. Players of moderate calibre are content to take the ball on the bound and to return it with some pace

along the side-lines or across the court, with the aim of placing it as artfully as possible beyond the reach of the adversary; and if now and again they venture to imitate a stroke employed with killing effect at Wimbledon, they think themselves fortunate if they occasionally succeed in making it without disaster to themselves.

Before 1890 the method of handicapping at lawn-tennis was the same as in tennis so far as it was applicable to a game played in an open court. In 1890 bisques were abolished, and in 1894 an elaborate system was introduced by which fractional parts of "fifteen" could be conceded by way of handicap, in accordance with tables inserted in the laws of the game. The system is a development of the tennis handicapping by which a finer graduation of odds may be given. "One-sixth of fifteen" is one stroke given in every six games of a set; and similarly two-sixths, three-sixths, four-sixths and five-sixths of fifteen, are respectively two, three, four and five strokes given in every six games of a set; the particular game in the set in which the stroke in each case must be given being specified in the tables.

*History.*—Lawn-tennis cannot be said to have existed prior to the year 1874. It is, indeed, true that outdoor games based on tennis were from time to time improvised by lovers of that game who found themselves out of reach of a tennis-court. Lord Arthur Hervey, sometime bishop of Bath and Wells, had thus devised a game which he and his friends played on the lawn of his rectory in Suffolk; and even so early as the end of the 18th century "field tennis" was mentioned by the *Sporting Magazine* as a game that rivalled the popularity of cricket. But, however much or little this game may have resembled lawn-tennis, it had long ceased to exist; and even to be remembered, when in 1874 Major Wingfield took out a patent for a game called Sphairistike, which the specification described as "a new and improved portable court for playing the ancient game of tennis." The court for this game was wider at the base-lines than at the net, giving the whole court the shape of an hour-glass; one side of the net only was divided into service-courts, service being always delivered from a fixed mark in the centre of the opposite court; and from the net-posts side-nets were fixed which tapered down to the ground at about the middle of the side-lines, thus enclosing nearly half the courts on each side of the net. The possibilities of Sphairistike were quickly perceived; and under the new name of lawn-tennis its popularity grew so quickly that in 1875 a meeting of those interested in the game was held at Lord's cricket-ground, where a committee of the Marylebone Club (M.C.C.) was appointed to draw up a code of rules. The hour-glass shape of the court was retained by this code (issued in May 1875), and the scoring of the game followed in the main the racquets instead of the tennis model. It was at the suggestion of J. M. Heathcote, the amateur tennis champion, that balls covered with white flannel were substituted for the uncovered balls used at first. In 1875, through the influence of Henry Jones ("Cavendish"), lawn-tennis was included in the programme of the All England Croquet Club, which in 1877 became the All England Croquet and Lawn-Tennis Club, on whose ground at Wimbledon the All England championships have been annually played since that date. In the same year, in anticipation of the first championship meeting, the club appointed a committee consisting of Henry Jones, Julian Marshall and C. G. Heathcote to revise the M.C.C. code of rules; the result of their labours being the introduction of the tennis in place of the racquets scoring, the substitution of a rectangular for the "hour-glass" court, and the enactment of the modern rule as regards the "fault." The height of the net, which under the M.C.C. rules had been 4 ft. in the centre, was reduced to 3 ft. 3 in.; and regulations as to the size and weight of the ball were also made. Some controversy had already taken place in the columns of the *Field* as to whether volleying the ball, at all events within a certain distance of the net, should not be prohibited. Spencer Gore, the first to win the championship in 1877, used the volley with great skill and judgment, and in principle anticipated the tactics afterwards brought to perfection by the Renshaws, which aimed at forcing the adversary back to the base-line and killing his return with a volley from a position near the net. P. F. Hadow, champion in 1878, showed how the volley might be defeated by skilful use of the lob; but the question of placing some check on the volley continued to be agitated among lovers of the game. The rapidly growing popularity of lawn-tennis was proved in 1879 by the inauguration at Oxford of the four-handed championship, and at Dublin of the Irish championship, and by the fact that there were forty-five competitors for the All England single championship at Wimbledon, won by J. T. Hartley, a player who chiefly relied on the accuracy of his return without frequent resort to the volley. It was in the autumn of the same year, in a tournament at Cheltenham, that W. Renshaw made his first successful appearance in public. The year 1880 saw the foundation of the Northern Lawn-Tennis Association, whose tournaments have long been regarded as inferior in importance only to the championship meetings at Wimbledon and Dublin, and a revision of the rules which substantially made them what they have ever since remained. This year is also memorable for the first championship doubles won by the twin brothers William and Ernest Renshaw, a success which the former followed up by winning the Irish championship, beating among

others H. F. Lawford for the first time.

The Renshaws had already developed the volleying game at the net, and had shown what could be done with the “smash” stroke (which became known by their name as the “Renshaw smash”), but their service had not as yet become very severe. In 1881 the distinctive features of their style were more marked, and the brothers first established firmly the supremacy which they maintained almost without interruption for the next eight years. In the doubles they discarded the older tactics of one partner standing back and the other near the net; the two Renshaws stood about the same level, just inside the service-line, and from there volleyed with relentless severity and with an accuracy never before equalled, and seldom if ever since; while their service also acquired an immense increase of pace. Their chief rival, and the leading exponent of the non-volleying game for several years, was H. F. Lawford. After a year or two it became evident that neither the volleying tactics of Renshaw nor the strong back play of Lawford would be adopted to the exclusion of the other, and both players began to combine the two styles. Thus the permanent features of lawn-tennis may be said to have been firmly established by about the year 1885; and the players who have since then come to the front have for the most part followed the principles laid down by the Renshaws and Lawford. One of the greatest performances at lawn-tennis was in the championship competition in 1886 when W. Renshaw beat Lawford a love set in 9½ minutes. The longest rest in first-class lawn-tennis occurred in a match between Lawford and E. Lubbock in 1880, when eighty-one strokes were played. Among players in the first class who were contemporaries of the Renshaws, mention should be made of E. de S. Browne, a powerful imitator of the Renshaw style; C. W. Grinstead, R. T. Richardson, V. Goold (who played under the *nom de plume* “St Leger”), J. T. Hartley, E. W. Lewis, E. L. Williams, H. Grove and W. J. Hamilton; while among the most prominent lady players of the period were Miss M. Langrishe, Miss Bradley, Miss Maud Watson, Miss L. Dod, Miss Martin and Miss Bingley (afterwards Mrs Hillyard). In 1888 the Lawn-Tennis Association was established; and the All England Mixed Doubles Championship (four-handed matches for ladies and gentlemen in partnership) was added to the existing annual competitions. Since 1881 lawn-tennis matches between Oxford and Cambridge universities have been played annually; and almost every county in England, besides Scotland, Wales and districts such as “Midland Counties,” “South of England,” &c., have their own championship meetings. Tournaments are also played in winter at Nice, Monte Carlo and other Mediterranean resorts where most of the competitors are English visitors.



The results of the All England championships have been as follows:—

| Year. | Gentlemen’s Singles. | Year. | Gentlemen’s Singles. |
|---|---|---|---|
| 1877 | S. W. Gore | 1894 | J. Pim |
| 1878 | P. F. Hadow | 1895 | W. Baddeley |
| 1879 | J. T. Hartley | 1896 | H. S. Mahony |
| 1880 | J. T. Hartley | 1897 | R. F. Doherty |
| 1881 | W. Renshaw | 1898 | R. F. Doherty |
| 1882 | W. Renshaw | 1899 | R. F. Doherty |
| 1883 | W. Renshaw | 1900 | R. F. Doherty |
| 1884 | W. Renshaw | 1901 | A. W. Gore |
| 1885 | W. Renshaw | 1902 | H. L. Doherty |
| 1886 | W. Renshaw | 1903 | H. L. Doherty |
| 1887 | H. F. Lawford | 1904 | H. L. Doherty |
| 1888 | E. Renshaw | 1905 | H. L. Doherty |
| 1889 | W. Renshaw | 1906 | H. L. Doherty |
| 1890 | W. J. Hamilton | 1907 | N. E. Brookes |
| 1891 | W. Baddeley | 1908 | A. W. Gore |
| 1892 | W. Baddeley | 1909 | A. W. Gore |
| 1893 | J. Pim | 1910 | A. F. Wilding |

| Year. | Gentlemen’s Doubles. | | |
|---|---|---|---|
| 1879 | L. R. Erskine | and | H. F. Lawford |
| 1880 | W. Renshaw | ” | E. Renshaw |
| 1881 | W. Renshaw | ” | E. Renshaw |
| 1882 | J. T. Hartley | ” | R. T. Richardson |
| 1883 | C. W. Grinstead | ” | C. E. Welldon |
| 1884 | W. Renshaw | ” | E. Renshaw |
| 1885 | W. Renshaw | ” | E. Renshaw |
| 1886 | W. Renshaw | ” | E. Renshaw |
| 1887 | P. B. Lyon | ” | H. W. W. Wilberforce |

| | | | |
|---|---|---|---|
| 1888 | W. Renshaw | ” | E. Renshaw |
| 1889 | W. Renshaw | ” | E. Renshaw |
| 1890 | J. Pim | ” | F. O. Stoker |
| 1891 | W. Baddeley | ” | H. Baddeley |
| 1892 | H. S. Barlow | ” | E. W. Lewis |
| 1893 | J. Pim | ” | F. O. Stoker |
| 1894 | W. Baddeley | ” | H. Baddeley |
| 1895 | W. Baddeley | ” | H. Baddeley |
| 1896 | W. Baddeley | ” | H. Baddeley |
| 1897 | R. F. Doherty | ” | H. L. Doherty |
| 1898 | R. F. Doherty | ” | H. L. Doherty |
| 1899 | R. F. Doherty | ” | H. L. Doherty |
| 1900 | R. F. Doherty | ” | H. L. Doherty |
| 1901 | R. F. Doherty | ” | H. L. Doherty |
| 1902 | S. H. Smith | ” | F. L. Riseley |
| 1903 | R. F. Doherty | ” | H. L. Doherty |
| 1904 | R. F. Doherty | ” | H. L. Doherty |
| 1905 | R. F. Doherty | ” | H. L. Doherty |
| 1906 | S. H. Smith | ” | F. L. Riseley |
| 1907 | N. E. Brookes | ” | A. F. Wilding |
| 1908 | M. J. G. Ritchie | ” | A. F. Wilding |
| 1909 | A. W. Gore | ” | H. Roper Barrett |
| 1910 | M. J. G. Ritchie | ” | A. F. Wilding |

| Year. | Ladies’ Singles. | Year. | Ladies’ Singles. |
|---|---|---|---|
| 1884 | Miss M. Watson | 1898 | Miss C. Cooper |
| 1885 | Miss M. Watson | 1899 | Mrs Hillyard |
| 1886 | Miss Bingley | 1900 | Mrs Hillyard |
| 1887 | Miss Dod | 1901 | Mrs Sterry (Miss C. Cooper) |
| 1888 | Miss Dod | 1902 | Miss M. E. Robb |
| 1889 | Mrs Hillyard (Miss Bingley) | 1903 | Miss D. K. Douglass |
| 1890 | Miss Rice | 1904 | Miss D. K. Douglass |
| 1891 | Miss Dod | 1905 | Miss M. Sutton |
| 1892 | Miss Dod | 1906 | Miss D. K. Douglass |
| 1893 | Miss Dod | 1907 | Miss M. Sutton |
| 1894 | Mrs Hillyard | 1908 | Mrs Sterry |
| 1895 | Miss C. Cooper | 1909 | Miss D. Boothby |
| 1896 | Miss C. Cooper | 1910 | Mrs Lambert Chambers (Miss Douglass) |
| 1897 | Mrs Hillyard | | |

| Year. | Ladies’ and Gentlemen’s Doubles. | | |
|---|---|---|---|
| 1888 | E. Renshaw | and | Mrs Hillyard |
| 1889 | J. C. Kay | ” | Miss Dod |
| 1890 | J. Baldwin | ” | Miss K. Hill |
| 1891 | J. C. Kay | ” | Miss Jackson |
| 1892 | A. Dod | ” | Miss Dod |
| 1893 | W. Baddeley | ” | Mrs Hillyard. |
| 1894 | H. S. Mahony | ” | Miss C. Cooper |
| 1895 | H. S. Mahony | ” | Miss C. Cooper |
| 1896 | H. S. Mahony | ” | Miss C. Cooper |
| 1897 | H. S. Mahony | ” | Miss C. Cooper |
| 1898 | H. S. Mahony | ” | Miss C. Cooper |
| 1899 | C. H. L. Cazelet | ” | Miss Robb |
| 1900 | H. L. Doherty | ” | Miss C. Cooper |
| 1901 | S. H. Smith | ” | Miss Martin |
| 1902 | S. H. Smith | ” | Miss Martin |
| 1903 | F. L. Riseley | ” | Miss D. K. Douglass |
| 1904 | S. H. Smith | ” | Miss E. W. Thompson |
| 1905 | S. H. Smith | ” | Miss E. W. Thompson |
| 1906 | F. L. Riseley | ” | Miss D. K. Douglass |
| 1907 | N. E. Brookes | ” | Mrs Hillyard |
| 1908 | A. F. Wilding | ” | Mrs Lambert Chambers (Miss D. K. Douglass) |
| 1909 | H. Roper Barrett | ” | Miss Morton |
| 1910 | S. N. Doust | ” | Mrs Lambert Chambers |

In the United States lawn-tennis was played at Nahant, near Boston, within a year of its

invention in England, Dr James Dwight and the brothers F. R. and R. D. Sears being mainly instrumental in making it known to their countrymen. In 1881 at a meeting in New York of representatives of thirty-three clubs the United States National Lawn-Tennis Association was formed; and the adoption of the English rules put an end to the absence of uniformity in the size of the ball and height of the net which had hindered the progress of the game. The association decided to hold matches for championship of the United States at Newport, Rhode Island; and, by a curious coincidence, in the same year in which W. Renshaw first won the English championship, R. D. Sears won the first American championship by playing a volleying game at the net which entirely disconcerted his opponents, and he successfully defended his title for the next six years, winning the doubles throughout the same period in partnership with Dwight. In 1887, Sears being unable to play through ill-health, the championship went to H. W. Slocum. Other prominent players of the period were the brothers C. M. and J. S. Clark, who in 1883 came to England and were decisively beaten at Wimbledon by the two Renshaws. To a later generation belong the strongest single players, M. D. Whitman, Holcombe Ward, W. A. Larned and Karl Behr. Holcombe Ward and Dwight Davis, who have the credit of introducing the peculiar “American twist service,” were an exceedingly strong pair in doubles; but after winning the American doubles championship for three years in succession, they were defeated in 1902 by the English brothers R. F. and H. L. Doherty. The championship singles in 1904 and 1905 was won by H. Ward and B. C. Wright, the latter being one of the finest players America has produced; and these two in partnership won the doubles for three years in succession, until they were displaced by F. B. Alexander and H. H. Hackett, who in their turn held the doubles championship for a like period. In 1909 two young Californians, Long and McLoughlin, unexpectedly came to the front, and, although beaten in the final round for the championship doubles, they represented the United States in the contest for the Davis cup (see below) in Australia in that year; McLoughlin having acquired a service of extraordinary power and a smashing stroke with a reverse spin which was sufficient by itself to place him in the highest rank of lawn-tennis players.

*Winners of United States Championships.*

| Year. | Gentlemen’s Singles. | Year. | Gentlemen’s Singles. |
|---|---|---|---|
| 1881 | R. D. Sears | 1896 | R. D. Wrenn |
| 1882 | R. D. Sears | 1897 | R. D. Wrenn |
| 1883 | R. D. Sears | 1898 | M. D. Whitman |
| 1884 | R. D. Sears | 1899 | M. D. Whitman |
| 1885 | R. D. Sears | 1900 | M. D. Whitman |
| 1886 | R. D. Sears | 1901 | W. A. Larned |
| 1887 | R. D. Sears | 1902 | W. A. Larned |
| 1888 | H. W. Slocum | 1903 | H. L. Doherty |
| 1889 | H. W. Slocum | 1904 | H. Ward |
| 1890 | O. S. Campbell | 1905 | B. C. Wright |
| 1891 | O. S. Campbell | 1906 | W. J. Clothier |
| 1892 | O. S. Campbell | 1907 | W. A. Larned |
| 1893 | R. D. Wrenn | 1908 | W. A. Larned |
| 1894 | R. D. Wrenn | 1909 | W. A. Larned |
| 1895 | F. H. Hovey | 1910 | W. A. Larned |

| Year. | Gentlemen’s Doubles. | | |
|---|---|---|---|
| 1882 | J. Dwight | and | R. D. Sears |
| 1883 | J. Dwight | ” | R. D. Sears |
| 1884 | J. Dwight | ” | R. D. Sears |
| 1885 | J. S. Clark | ” | R. D. Sears |
| 1886 | J. Dwight | ” | R. D. Sears |
| 1887 | J. Dwight | ” | R. D. Sears |
| 1888 | V. G. Hall | ” | O. S. Campbell |
| 1889 | H. W. Slocum | ” | H. A. Taylor |
| 1890 | V. G. Hall | ” | C. Hobart |
| 1891 | O. S. Campbell | ” | R. P. Huntingdon |
| 1892 | O. S. Campbell | ” | R. P. Huntingdon |
| 1893 | C. Hobart | ” | F. H. Hovey |
| 1894 | C. Hobart | ” | F. H. Hovey |
| 1895 | R. D. Wrenn | ” | M. G. Chase |
| 1896 | C. B. Neel | ” | S. R. Neel |

| | | | |
|---|---|---|---|
| 1897 | L. E. Ware | ” | G. P. Sheldon |
| 1898 | L. E. Ware | ” | G. P. Sheldon |
| 1899 | D. F. Davis | ” | H. Ward |
| 1900 | D. F. Davis | ” | H. Ward |
| 1901 | D. F. Davis | ” | H. Ward |
| 1902 | R. F. Doherty | ” | H. L. Doherty |
| 1903 | R. F. Doherty | ” | H. L. Doherty |
| 1904 | H. Ward | ” | B. C. Wright |
| 1905 | H. Ward | ” | B. C. Wright |
| 1906 | H. Ward | ” | B. C. Wright |
| 1907 | F. B. Alexander | ” | H. H. Hackett |
| 1908 | F. B. Alexander | ” | H. H. Hackett |
| 1909 | F. B. Alexander | ” | H. H Hackett |
| 1910 | F. B. Alexander | ” | H. H. Hackett |

| Year. | Ladies’ Singles. | Year. | Ladies’ Singles. |
|---|---|---|---|
| 1890 | Miss E. C. Roosevelt | 1901 | Miss Elizabeth H. Moore |
| 1891 | Miss Mabel E. Cahill | 1902 | Miss Marion Jones |
| 1892 | Miss Mabel E. Cahill | 1903 | Miss Elizabeth H. Moore |
| 1893 | Miss Aline M. Terry | 1904 | Miss May Sutton |
| 1894 | Miss Helen R. Helwig | 1905 | Miss Elizabeth H. Moore |
| 1895 | Miss J. P. Atkinson | 1906 | Miss Helen H. Homans |
| 1896 | Miss Elizabeth H. Moore | 1907 | Miss Evelyn Sears |
| 1897 | Miss J. P. Atkinson | 1908 | Mrs Barger Wallach |
| 1898 | Miss J. P. Atkinson | 1909 | Miss Hazel Hotchkiss |
| 1899 | Miss Marion Jones | 1910 | Miss Hazel Hotchkiss |
| 1900 | Miss Myrtle McAteer | | |

| Year. | Ladies’ and Gentlemen’s Doubles. | | |
|---|---|---|---|
| 1894 | E. P. Fischer | and | Miss J. P. Atkinson |
| 1895 | E. P. Fischer | ” | Miss J. P. Atkinson |
| 1896 | E. P. Fischer | ” | Miss J. P. Atkinson |
| 1897 | D. L. Magruder | ” | Miss Laura Henson |
| 1898 | E. P. Fischer | ” | Miss Carrie Neely |
| 1899 | A. L. Hoskins | ” | Miss Edith Rastall |
| 1900 | Alfred Codman | ” | Miss M. Hunnewell |
| 1901 | R. D. Little | ” | Miss Marion Jones |
| 1902 | W. C. Grant | ” | Miss E. H. Moore |
| 1903 | Harry Allen | ” | Miss Chapman |
| 1904 | W. C. Grant | ” | Miss E. H. Moore |
| 1905 | Clarence Hobart | ” | Mrs Clarence Hobart |
| 1906 | E. B. Dewhurst | ” | Miss Coffin |
| 1907 | W. F. Johnson | ” | Miss Sayres |
| 1908 | N. W. Niles | ” | Miss E. Rotch |
| 1909 | W. F. Johnson | ” | Miss H. Hotchkiss |
| 1910 | J. R. Carpenter | ” | Miss H. Hotchkiss |

In 1900 an international challenge cup was presented by the American D. F. Davis, to be competed for in the country of the holders. In the summer of that year a British team, consisting of A. W. Gore, E. D. Black and H. R. Barrett, challenged for the cup but were defeated by the Americans, Whitman, Larned, Davis and Ward. In 1902 a more representative British team, the two Dohertys and Pim, were again defeated by the same representatives of the United States; but in the following year the Dohertys brought the Davis cup to England by beating Larned and the brothers Wrenn at Longwood. In 1904 the cup was played for at Wimbledon, when representatives of Belgium, Austria and France entered, but failed to defeat the Dohertys and F. L. Riseley, who represented Great Britain. In 1905 the entries included France, Austria, Australasia, Belgium and the United States; in 1906 the same countries, except Belgium, competed; but in both years the British players withstood the attack. In 1907, however, when the contest was confined to England, the United States and Australasia, the latter was successful in winning the cup, which was then for the first time taken to the colonies, where it was retained in the following year when the Australians N. E. Brookes and A. F. Wilding defeated the representatives of the United States, who had previously beaten the English challengers in America. In 1909 England was not represented in the competition, and the Australians again retained the cup, beating the Americans McLoughlin and Long both in singles and doubles.

See “The Badminton Library,” *Tennis: Lawn-Tennis: Racquets: Fives*, new and revised edition (1903); R. F. and H. L. Doherty, *On Lawn-Tennis* (1903); E. H. Miles, *Lessons in Lawn-Tennis* (1899); E. de Nanteuil, *La Paume et le lawn-tennis* (1898); J. Dwight, “Form in Lawn-Tennis,” in *Scribner’s Magazine*, vol. vi.; A. Wallis Myers, *The Complete Lawn-Tennis Player* (1908).

(R. J. M.)

## LAWRENCE (Laurentius, Lorenzo), ST,

Christian martyr, whose name appears in the canon of the mass, and whose festival is on the 10th of August. The basilica reared over his tomb at Rome is still visited by pilgrims. His legend is very popular. Deacon of the pope (St) Sixtus (Xystus) II., he was called upon by the judge to bring forth the treasures of the church which had been committed to his keeping. He thereupon produced the church’s poor people. Seeing his bishop, Sixtus, being led to punishment, he cried: “Father! whither goest thou without thy son? Holy priest! whither goest thou without thy deacon?” Sixtus prophesied that Lawrence would follow him in three days. The prophecy was fulfilled, and Lawrence was sentenced to be burnt alive on a gridiron. In the midst of his torments he addressed the judge ironically with the words: *Assum est, versa et manduca* (“I am roasted enough on this side; turn me round, and eat”). All these details of the well-known legend are already related by St Ambrose (*De Offic.* i. 41, ii. 28). The punishment of the gridiron and the speech of the martyr are probably a reminiscence of the Phrygian martyrs, as related by Socrates (iii. 15) and Sozomen (v. 11). But the fact of the martyrdom is unquestionable. The date is usually put at the persecution of Valerian in 258.

The cult of St Lawrence has spread throughout Christendom, and there are numerous churches dedicated to him, especially in England, where 228 have been counted. The Escurial was built in honour of St Lawrence by Philip II. of Spain, in memory of the battle of St Quentin, which was won in 1557 on the day of the martyr’s festival. The meteorites which appear annually on or about the 10th of August are popularly known as “the tears of St Lawrence.”

See *Acta sanctorum*, Augusti ii. 485-532; P. Franchi de’ Cavalieri, *S. Lorenzo e il supplicio della graticola* (Rome, 1900); *Analecta Bollandiana*, xix. 452 and 453; Fr. Arnold-Forster, *Studies in Church Dedications or England’s Patron Saints*, i. 508-515, iii. 18, 389-390 (1899).

(H. De.)

## LAWRENCE, AMOS

(1786-1852), American merchant and philanthropist, was born in Groton, Massachusetts, U.S.A., on the 22nd of April 1786, a descendant of John Lawrence of Wisset, Suffolk, England, who was one of the first settlers of Groton. Leaving Groton academy (founded by his father, Samuel Lawrence, and others) in 1799, he became a clerk in a country store in Groton, whence after his apprenticeship he went, with $20 in his pocket, to Boston and there set up in business for himself in December 1807. In the next year he took into his employ his brother, Abbott (see below), whom he made his partner in 1814, the firm name being at first A. & A. Lawrence, and afterwards A. & A. Lawrence & Co. In 1831 when his health failed, Amos Lawrence retired from active business, and Abbott Lawrence was thereafter the head of the firm. The firm became the greatest American mercantile house of the day, was successful even in the hard times of 1812-1815, afterwards engaged particularly in selling woollen and cotton goods on commission, and did much for the establishment of the cotton textile industry in New England: in 1830 by coming to the aid of the financially distressed mills of Lowell, Massachusetts, where in that year the Suffolk, Tremont and Lawrence companies were established, and where Luther Lawrence, the eldest brother, represented the firm’s interests; and in 1845-1847 by establishing and building up Lawrence, Massachusetts, named in honour of Abbott Lawrence, who was a director of the Essex company, which controlled the water power of Lawrence, and afterwards was president of the Atlantic Cotton Mills and Pacific Mills there. In 1842 Amos

Lawrence decided not to allow his property to increase any further, and in the last eleven years of his life he spent in charity at least $525,000, a large sum in those days. He gave to Williams college, to Bowdoin college, to the Bangor theological seminary, to Wabash college, to Kenyon college and to Groton academy, which was re-named Lawrence academy in honour of the family, and especially in recognition of the gifts of William Lawrence, Amos's brother; to the Boston children's infirmary, which he established, and ($10,000) to the Bunker Hill monument fund; and, besides, he gave to many good causes on a smaller scale, taking especial delight in giving books, occasionally from a bundle of books in his sleigh or carriage as he drove. He died in Boston on the 31st of December 1852.

See *Extracts from the Diary and Correspondence of the late Amos Lawrence, with a Brief Account of Some Incidents in his Life* (Boston, 1856), edited by his son William R. Lawrence.

His brother, Abbott Lawrence (1792-1855), was born in Groton, Massachusetts, on the 16th of December 1792. Besides being a partner in the firm established by his brother, and long its head, he promoted various New England railways, notably the Boston & Albany. He was a Whig representative in Congress in 1835-1837 and in 1839-1840 (resigning in September 1840 because of ill-health); and in 1842 was one of the commissioners for Massachusetts, who with commissioners from Maine and with Daniel Webster, secretary of state and plenipotentiary of the United States, settled with Lord Ashburton, the British plenipotentiary, the question of the north-eastern boundary. In 1842 he was presiding officer in the Massachusetts Whig convention; he broke with President Tyler, tacitly rebuked Daniel Webster for remaining in Tyler's cabinet after his colleagues had resigned, and recommended Henry Clay and John Davis as the nominees of the Whig party in 1844—an action that aroused Webster to make his famous Faneuil Hall address. In 1848 Lawrence was a prominent candidate for the Whig nomination for the vice-presidency, but was defeated by Webster's followers. He refused the portfolios of the navy and of the interior in President Taylor's cabinet, and in 1849-1852 was United States minister to Great Britain, where he was greatly aided by his wealth and his generous hospitality. He was an ardent protectionist, and represented Massachusetts at the Harrisburg convention in 1827. He died in Boston on the 18th of August 1855, leaving as his greatest memorial the Lawrence scientific school of Harvard university, which he had established by a gift of $50,000 in 1847 and to which he bequeathed another $50,000; in 1907-1908 this school was practically abolished as a distinct department of the university. He made large gifts to the Boston public library, and he left $50,000 for the erection of model lodging-houses, thus carrying on the work of an Association for building model lodging-houses for the poor, organized in Boston in 1857.

See Hamilton A. Hill, *Memoir of Abbott Lawrence* (Boston, 1884). Randolph Anders' *Der Weg zum Glück, oder die Kunst Millionär zu werden* (Berlin, 1856) is a pretended translation of moral maxims from a supposititious manuscript bequeathed to Abbott Lawrence by a rich uncle.

## LAWRENCE, AMOS ADAMS (1814-1886), American philanthropist, son of Amos Lawrence, was born in Groton, Massachusetts, U.S.A., on the 31st of July 1814. He graduated at Harvard in 1835, went into business in Lowell, and in 1837 established in Boston his own counting-house, which from 1843 to 1858 was the firm of Lawrence & Mason, and which was a selling agent for the Cocheco mills of Dover, New Hampshire, and for other textile factories. Lawrence established a hosiery and knitting mill at Ipswich—the first of importance in the country—and was a director in many large corporations. He was greatly interested in the claims of Eleazer Williams of Green Bay, Wisconsin, and through loans to this "lost dauphin" came into possession of much land in Wisconsin; in 1849 he founded at Appleton, Wisconsin, a school named in his honour Lawrence university (now Lawrence college). He also contributed to funds for the colonization of free negroes in Liberia. In 1854 he became treasurer of the Massachusetts Emigrant Aid Company (reorganized in 1855 as the New England Emigrant Aid Company), which sent 1300 settlers to Kansas, where the city of Lawrence was named in his honour. He contributed personally for the famous Sharp rifles, which, packed as "books" and "primers," were shipped to Kansas and afterwards came into the hands of John Brown, who had been a *protégé* of

Lawrence. During the contest in Kansas, Lawrence wrote frequently to President Pierce (his mother's nephew) in behalf of the free-state settlers; and when John Brown was arrested he appealed to the governor of Virginia to secure for him a lawful trial. On Robinson and others in Kansas he repeatedly urged the necessity of offering no armed resistance to the Federal government; and he deplored Brown's fanaticism. In 1858 and in 1860 he was the Whig candidate for governor of Massachusetts. Till the very outbreak of the Civil War he was a "law and order" man, and he did his best to secure the adoption of the Crittenden compromise; but he took an active part in drilling troops, and in 1862 he raised a battalion of cavalry which became the 2nd Massachusetts Regiment of Cavalry, of which Charles Russell Lowell was colonel. Lawrence was a member of the Protestant Episcopal Church and built (1873-1880) Lawrence hall, Cambridge, for the Episcopal theological school, of which he was treasurer. In 1857-1862 he was treasurer of Harvard college, and in 1879-1885 was an overseer. He died in Nahant, Mass., on the 22nd of August 1886.

See William Lawrence, *Life of Amos A. Lawrence, with Extracts from his Diary and Correspondence* (Boston, 1888).

His son, WILLIAM LAWRENCE (1850- ), graduated in 1871 at Harvard, and in 1875 at the Episcopal theological school, where, after being rector of Grace Church, Lawrence, Mass., in 1876-1884, he was professor of homiletics and natural theology in 1884-1893 and dean in 1888-1893. In 1893 he succeeded Phillips Brooks as Protestant Episcopal bishop of Massachusetts. He wrote *A Life of Roger Wolcott, Governor of Massachusetts* (1902).

## LAWRENCE, GEORGE ALFRED

(1827-1876), English novelist, was born at Braxted, Essex, on the 25th of March 1827, and was educated at Rugby and at Balliol college, Oxford. He was called to the bar at the Inner Temple in 1852, but soon abandoned the law for literature. In 1857 he published, anonymously, his first novel, *Guy Livingstone, or Thorough*. The book achieved a very large sale, and had nine or ten successors of a similar type, the best perhaps being *Sword and Gown* (1859). Lawrence may be regarded as the originator in English fiction of the *beau sabreur* type of hero, great in sport and love and war. He died at Edinburgh on the 23rd of September 1876.

## LAWRENCE, SIR HENRY MONTGOMERY

(1806-1857), British soldier and statesman in India, brother of the 1st Lord Lawrence (*q.v.*), was born at Matara, Ceylon, on the 28th of June 1806. He inherited his father's stern devotion to duty and Celtic impulsiveness, tempered by his mother's gentleness and power of organization. Early in 1823 he joined the Bengal Artillery at the Calcutta suburb of Dum Dum, where also Henry Havelock was stationed about the same time. The two officers pursued a very similar career, and developed the same Puritan character up to the time that both died at Lucknow in 1857. In the first Burmese War Henry Lawrence and his battery formed part of the Chittagong column which General Morrison led over the jungle-covered hills of Arakan, till fever decimated the officers and men, and Lawrence found himself at home again, wasted by a disease which never left him. On his return to India with his younger brother John in 1829 he was appointed revenue surveyor by Lord William Bentinck. At Gorakhpur the wonderful personal influence which radiated from the young officer formed a school of attached friends and subordinates who were always eager to serve under him. After some years spent in camp, during which he had married his cousin Honoria Marshall, and had surveyed every village in four districts, each larger than Yorkshire, he was recalled to a brigade by the outbreak of the first Afghan War towards the close of 1838. As assistant to Sir George Clerk, he now added to his knowledge of the people political experience in the management of the district of Ferozepore; and when disaster came he was sent to Peshawar in order to push up supports for the relief of Sale and the garrison of Jalalabad. The war had been begun under

the tripartite treaty signed at Lahore on the 20th of June 1838. But the Sikhs were slow to play their part after the calamities in Afghanistan. No one but Henry Lawrence could manage the disorderly contingent which they reluctantly supplied to Pollock's avenging army in 1842. He helped to force the Khyber Pass on the 5th of April, playing his guns from the heights, for 8 and 20 m. In recognition of his services Lord Ellenborough appointed him to the charge of the valley of Dehra Dun and its hill stations, Mussoorie and Landour, where he first formed the idea of asylums for the children of European soldiers. After a month's experience there it was discovered that the appointment, was the legal right of the civil service, and he was transferred, as assistant to the envoy at Lahore, to Umballa, where he reduced to order the lapsed territory of Kaithal. Soon he received the office of resident at the protected court of Nepal, where, assisted by his wife, he began a series of contributions to the *Calcutta Review*, a selected volume of which forms an Anglo-Indian classic. There, too, he elaborated his plans which resulted in the erection and endowment of the noblest philanthropic establishments in the East—the Lawrence military asylums at Sanawar (on the road to Simla), at Murree in the Punjab, at Mount Abu in Rajputana, and at Lovedale on the Madras Nilgiris. From 1844 to his death he devoted all his income, above a modest pittance for his children, to this and other forms of charity.

The *Review* articles led the new governor-general, Lord Hardinge, to summon Lawrence to his side during the first Sikh War; and not these articles only. He had published the results of his experience of Sikh rule and soldiering in a vivid work, the *Adventures of an Officer in the Service of Ranjit Singh* (1845), in which he vainly attempted to disguise his own personality and exploits. After the doubtful triumphs of Moodkee and Ferozshah Lawrence was summoned from Nepal to take the place of Major George Broadfoot, who had fallen. Aliwal came; then the guns of Sobraon chased the demoralized Sikhs across the Sutlej. All through the smoke Lawrence was at the side of the governor-general. He gave his voice, not for the rescue of the people from anarchy by annexation, but for the reconstruction of the Sikh government, and was himself appointed resident at Lahore, with power "over every department and to any extent" as president of the council of regency till the maharaja Dhuleep Singh should come of age. Soon disgusted by the "venal and selfish durbar" who formed his Sikh colleagues, he summoned to his side assistants like Nicholson, James Abbott and Edwardes, till they all did too much for the people, as he regretfully confessed. But "my chief confidence was in my brother John, ... who gave me always such help as only a brother could." Wearied out he went home with Lord Hardinge, and was made K.C.B., when the second Sikh War summoned him back at the end of 1848 to see the whole edifice of Sikh "reconstruction" collapse. It fell to Lord Dalhousie to proclaim the Punjab up to the Khyber British territory on the 29th of March 1849. But still another compromise was tried. As the best man to reconcile the Sikh chiefs to the inevitable, Henry Lawrence was made president of the new board of administration with charge of the political duties, and his brother John was entrusted with the finances. John could not find the revenue necessary for the rapid civilization of the new province so long as Henry would, for political reasons, insist on granting life pensions and alienating large estates to the needy remnants of Ranjit Singh's court. Lord Dalhousie delicately but firmly removed Sir Henry Lawrence to the charge of the great nobles of Rajputana, and installed John as chief commissioner. If resentment burned in Henry's heart, it was not against his younger brother, who would fain have retired. To him he said, "If you preserve the peace of the country and make the people high and low happy, I shall have no regrets that I vacated the field for you."

In the comparative rest of Rajputana he once more took up the pen as an army reformer. In March and September 1856 he published two articles, called forth by conversations with Lord Dalhousie at Calcutta, whither he had gone as the hero of a public banquet. The governor-general had vainly warned the home authorities against reducing below 40,000 the British garrison of India even for the Crimean War, and had sought to improve the position of the sepoys. Lawrence pointed out the latent causes of mutiny, and uttered warnings to be too soon justified. In March 1857 he yielded to Lord Canning's request that he should then take the helm at Lucknow, but it was too late. In ten days his magic rule put down administrative difficulties indeed, as he had done at Lahore. But what could even he effect with only 700 European soldiers, when the epidemic spread after the Meerut outbreak of mutiny on the 10th of May? In one week he had completed those preparations which made the defence of the Lucknow residency for ever memorable. Amid the deepening gloom Lord Canning ever wrote home of him as "a tower of strength," and he was appointed provisional governor-general. On the 30th of May mutiny burst forth in Oudh, and he was ready. On the 29th of June, pressed by fretful colleagues, and wasted by unceasing toil, he led 336 British soldiers with 11 guns and 220 natives out of Chinhat to reconnoitre the insurgents, when the natives joined the enemy and the residency was besieged. On the 2nd of July, as he lay

exhausted by the day's work and the terrific heat in an exposed room, a shell struck him, and in forty-eight hours he was no more. A baronetcy was conferred on his son. A marble statue was placed in St Paul's as the national memorial of one who has been declared to be the noblest man that has lived and died for the good of India.

His biography was begun by Sir Herbert Edwardes, and completed (2 vols. 1872) by Herman Merivale. See also J. J. McLeod Innes, *Sir Henry Lawrence* ("Rulers of India" series), 1898.

## LAWRENCE, JOHN LAIRD MAIR LAWRENCE, 1st Baron (1811-1879),

viceroy and governor-general of India, was born at Richmond, Yorkshire, on the 24th of March 1811. His father, Colonel Alexander Lawrence, volunteered for the forlorn hope at Seringapatam in presence of Baird and of Wellington, whose friend he became. His mother, Letitia Knox, was a collateral descendant of John Knox. To this couple were born twelve children, of whom three became famous in India, Sir George St Patrick, Sir Henry (*q.v.*) and Lord Lawrence. Irish Protestants, the boys were trained at Foyle college, Derry, and at Clifton, and received Indian appointments from their mother's cousin, John Hudleston, who had been the friend of Schwartz in Tanjore. In 1829, when only seventeen, John Lawrence landed at Calcutta as a civilian; he mastered the Persian language at the college of Fort William, and was sent to Delhi, on his own application, as assistant to the collector. The position was the most dangerous and difficult to which a Bengal civilian could be appointed at that time. The titular court of the pensioner who represented the Great Mogul was the centre of that disaffection and sensuality which found their opportunity in 1857. A Mussulman rabble filled the city. The district around, stretching from the desert of Rajputana to the Jumna, was slowly recovering from the anarchy to which Lord Lake had given the first blow. When not administering justice in the city courts or under the village tree, John Lawrence was scouring the country after the marauding Meos and Mahommedan freebooters. His keen insight and sleepless energy at once detected the murderer of his official superior, William Fraser, in 1835, in the person of Shams-uddin Khan, the nawab of Loharu, whose father had been raised to the principality by Lake, and the assassin was executed. The first twenty years, from 1829 to 1849, during which John Lawrence acted as the magistrate and land revenue collector of the most turbulent and backward portion of the Indian empire as it then was, formed the period of the reforms of Lord William Bentinck. To what became the lieutenant-governorship of the North-Western (now part of the United) Provinces Lord Wellesley had promised the same permanent settlement of the land-tax which Lord Cornwallis had made with the large landholders or zemindars of Bengal. The court of directors, going to the opposite extreme, had sanctioned leases for only five years, so that agricultural progress was arrested. In 1833 Merttins Bird and James Thomason introduced the system of thirty years' leases based on a careful survey of every estate by trained civilians, and on the mapping of every village holding by native subordinates. These two revenue officers created a school of enthusiastic economists who rapidly registered and assessed an area as large as that of Great Britain, with a rural population of twenty-three millions. Of that school John Lawrence proved the most ardent and the most renowned. Intermitting his work at Delhi, he became land revenue settlement officer in the district of Etawah, and there began, by buying out or getting rid of the talukdars, to realize the ideal which he did much to create throughout the rest of his career—a country "thickly cultivated by a fat contented yeomanry, each man riding his own horse, sitting under his own fig-tree, and enjoying his rude family comforts." This and a quiet persistent hostility to the oppression of the people by their chiefs formed the two features of his administrative policy throughout life.



It was fortunate for the British power that, when the first Sikh War broke out, John Lawrence was still collector of Delhi. The critical engagements at Ferozeshah, following Moodkee, and hardly redeemed by Aliwal, left the British army somewhat exhausted at the gate of the Punjab, in front of the Sikh entrenchments on the Sutlej. For the first seven weeks of 1846 there poured into camp, day by day, the supplies and munitions of war which this one man raised and pushed forward, with all the influence acquired during fifteen years of an iron yet sympathetic rule in the land between the Jumna and the Sutlej. The crowning

victory of Sobraon was the result, and at thirty-five Lawrence became commissioner of the Jullundur Doab, the fertile belt of hill and dale stretching from the Sutlej north to the Indus. The still youthful civilian did for the newly annexed territory what he had long before accomplished in and around Delhi. He restored it to order, without one regular soldier. By the fascination of his personal influence he organized levies of the Sikhs who had just been defeated, led them now against a chief in the upper hills and now to storm the fort of a raja in the lower, till he so welded the people into a loyal mass that he was ready to repeat the service of 1846 when, three years after, the second Sikh War ended in the conversion of the Punjab up to Peshawar into a British province.

Lord Dalhousie had to devise a government for a warlike population now numbering twenty-three millions, and covering an area little less than that of the United Kingdom. The first results were not hopeful; and it was not till John Lawrence became chief commissioner, and stood alone face to face with the chiefs and people and ring fence of still untamed border tribes, that there became possible the most successful experiment in the art of civilizing turbulent millions which history presents. The province was mapped out into districts, now numbering thirty-two, in addition to thirty-six tributary states, small and great. To each the thirty years' leases of the north-west settlement were applied, after a patient survey and assessment by skilled officials ever in the saddle or the tent. The revenue was raised on principles so fair to the peasantry that Ranjit Singh's exactions were reduced by a fourth, while agricultural improvements were encouraged. For the first time in its history since the earliest Aryan settlers had been overwhelmed by successive waves of invaders, the soil of the Punjab came to have a marketable value, which every year of British rule has increased. A stalwart police was organized; roads were cut through every district, and canals were constructed. Commerce followed on increasing cultivation and communications, courts brought justice to every man's door, and crime hid its head. The adventurous and warlike spirits, Sikh and Mahommedan, found a career in the new force of irregulars directed by the chief commissioner himself, while the Afghan, Dost Mahommed, kept within his own fastnesses, and the long extent of frontier at the foot of the passes was patrolled.

Seven years of such work prepared the lately hostile and always anarchic Punjab under such a pilot as John Lawrence not only to weather the storm of 1857 but to lead the older provinces into port. On the 12th of May the news of the tragedies at Meerut and Delhi reached him at Rawalpindi. The position was critical in the last degree, for of 50,000 native soldiers 38,000 were Hindustanis of the very class that had mutinied elsewhere, and the British troops were few and scattered. For five days the fate of the Punjab hung upon a thread, for the question was, "Could the 12,000 Punjabis be trusted and the 38,000 Hindustanis be disarmed?" Not an hour was lost in beginning the disarming at Lahore; and, as one by one the Hindustani corps succumbed to the epidemic of mutiny, the sepoys were deported or disappeared, or swelled the military rabble in and around the city of Delhi. The remembrance of the ten years' war which had closed only in 1849, a bountiful harvest, the old love of battle, the offer of good pay, but, above all, the personality of Lawrence and his officers, raised the Punjabi force into a new army of 59,000 men, and induced the non-combatant classes to subscribe to a 6% loan. Delhi was invested, but for three months the rebel city did not fall. Under John Nicholson, Lawrence sent on still more men to the siege, till every available European and faithful native soldier was there, while a movable column swept the country, and the border was kept by an improvised militia. At length, when even in the Punjab confidence became doubt, and doubt distrust, and that was passing into disaffection, John Lawrence was ready to consider whether we should not give up the Peshawar valley to the Afghans as a last resource, and send its garrison to recruit the force around Delhi. Another week and that alternative must have been faced. But on the 20th of September the city and palace of Delhi were again in British hands, and the chief commissioner and his officers united in ascribing "to the Lord our God all the praise due for nerving the hearts of our statesmen and the arms of our soldiers." As Sir John Lawrence, Bart., G.C.B., with the thanks of parliament, the gratitude of his country, and a life pension of £2000 a year in addition to his ordinary pension of £1000, the "saviour of India" returned home in 1859. After guarding the interests of India and its people as a member of the secretary of state's council, he was sent out again in 1864 as viceroy and governor-general on the death of Lord Elgin. If no great crisis enabled Lawrence to increase his reputation, his five years' administration of the whole Indian empire was worthy of the ruler of the Punjab. His foreign policy has become a subject of imperial interest, his name being associated with the "close border" as opposed to the "forward" policy; while his internal administration was remarkable for financial prudence, a jealous regard for the good of the masses of the people and of the British soldiers, and a generous interest in education, especially in its Christian aspects.

When in 1854 Dost Mahommed, weakened by the antagonism of his brothers in Kandahar, and by the interference of Persia, sent his son to Peshawar to make a treaty, Sir John Lawrence was opposed to any entangling relation with the Afghans after the experience of 1838-1842, but he obeyed Lord Dalhousie so far as to sign a treaty of perpetual peace and friendship. His ruling idea, the fruit of long and sad experience, was that *de facto* powers only should be recognized beyond the frontier. When in 1863 Dost Mahommed's death let loose the factions of Afghanistan he acted on this policy to such an extent that he recognized both the sons, Afzul Khan and Shere Ali, at different times, and the latter fully only when he had made himself master of all his father's kingdom. The steady advance of Russia from the north, notwithstanding the Gortchakov circular of 1864, led to severe criticism of this cautious "buffer" policy which he justified under the term of "masterly inactivity." But he was ready to receive Shere Ali in conference, and to aid him in consolidating his power after it had been established and maintained for a time, when his term of office came to an end and it fell to Lord Mayo, his successor, to hold the Umballa conference in 1869. When, nine years after, the second Afghan War was precipitated, the retired viceroy gave the last days of his life to an unsparing exposure, in the House of Lords and in the press, of a policy which he had striven to prevent in its inception, and which he did not cease to denounce in its course and consequences.

On his final return to England early in 1869, after forty years' service in and for India, "the great proconsul of our English Christian empire" was created Baron Lawrence of the Punjab, and of Grately, Hants. He assumed the same arms and crest as those of his brother Henry, with a Pathan and a Sikh trooper as supporters, and took as his motto "Be ready," his brother's being "Never give in." For ten years he gave himself to the work of the London school board, of which he was the first chairman, and of the Church missionary society. Towards the end his eyesight failed, and on the 27th of June 1879 he died at the age of sixty-eight. He was buried in the nave of Westminster Abbey, beside Clyde, Outram and Livingstone. He had married the daughter of the Rev. Richard Hamilton, Harriette-Katherine, who survived him, and he was succeeded as 2nd baron by his eldest son, John Hamilton Lawrence (b. 1846).



See Bosworth Smith, *Life of Lord Lawrence* (1885); Sir Charles Aitchison, *Lord Lawrence* ("Rulers of India" series, 1892); L. J. Trotter, *Lord Lawrence* (1880); and F. M. Holmes, *Four Heroes of India*.

## LAWRENCE, STRINGER

(1697-1775), English soldier, was born at Hereford on the 6th of March 1697. He seems to have entered the army in 1727 and served in Gibraltar and Flanders, subsequently taking part in the battle of Culloden. In 1748, with the rank of major and the reputation of an experienced soldier, he went out to India to command the East India Company's troops. Dupleix's schemes for the French conquest of southern India were on the point of taking effect, and not long after his arrival at Fort St David, Stringer Lawrence was actively engaged. He successfully foiled an attempted French surprise at Cuddalore, but subsequently was captured by a French cavalry patrol at Ariancopang near Pondicherry and kept prisoner till the peace of Aix-la-Chapelle. In 1749 he was in command at the capture of Devicota. On this occasion Clive served under him and a life-long friendship began. On one occasion, when Clive had become famous, he honoured the creator of the Indian army by refusing to accept a sword of honour unless one was voted to Lawrence also. In 1750 Lawrence returned to England, but in 1752 he was back in India. Here he found Clive in command of a force intended for the relief of Trichinopoly. As senior officer Lawrence took over the command, but was careful to allow Clive every credit for his share in the subsequent operations, which included the relief of Trichinopoly and the surrender of the entire French besieging force. In 1752 with an inferior force he defeated the French at Bahur (Behoor) and in 1753 again relieved Trichinopoly. For the next seventeen months he fought a series of actions in defence of this place, finally arranging a three months' armistice, which was afterwards converted into a conditional treaty. He had commanded in chief up to the arrival of the first detachment of regular forces of the crown. In 1757 he served in the operations against Wandiwash, and in 1758-1759 was in command of Fort St George during the siege by the French under Lally. In 1759 failing health

compelled him to return to England. He resumed his command in 1761 as major-general and commander-in-chief. Clive supplemented his old friend's inconsiderable income by settling on him an annuity of £500 a year. In 1765 he presided over the board charged with arranging the reorganization of the Madras army, and he finally retired the following year. He died in London on the 10th of January 1775. The East India Company erected a monument to his memory in Westminster Abbey.

See Biddulph, *Stringer Lawrence* (1901).

LAWRENCE, SIR THOMAS (1769-1830), English painter, was born at Bristol on the 4th of May 1769. His father was an innkeeper, first at Bristol and afterwards at Devizes, and at the age of six Thomas was already shown off to the guests of the Black Boar as an infant prodigy who could sketch their likenesses and declaim speeches from Milton. In 1779 the elder Lawrence had to leave Devizes, having failed in business, and the precocious talent of the son, who had gained a sort of reputation along the Bath road, became the support of the family. His debut as a crayon portrait painter was made at Oxford, where he was well patronized, and in 1782 the family settled in Bath, where the young artist soon found himself fully employed in taking crayon likenesses of the fashionables of the place at a guinea or a guinea and a half a head. In 1784 he gained the prize and silver-gilt palette of the Society of Arts for a crayon drawing after Raphael's "Transfiguration," and presently beginning to paint in oil. Throwing aside the idea of going on the stage which he had for a short time entertained, he came to London in 1787, was kindly received by Reynolds, and entered as a student at the Royal Academy. He began to exhibit almost immediately, and his reputation increased so rapidly that he became an associate of the Academy in 1791. The death of Sir Joshua in 1792 opened the way to further successes. He was at once appointed painter to the Dilettanti society, and principal painter to the king in room of Reynolds. In 1794 he was a Royal Academician, and he became the fashionable portrait painter of the age, having as his sitters all the rank, fashion and talent of England, and ultimately most of the crowned heads of Europe. In 1815 he was knighted; in 1818 he went to Aix-la-Chapelle to paint the sovereigns and diplomatists gathered there, and visited Vienna and Rome, everywhere receiving flattering marks of distinction from princes, due as much to his courtly manners as to his merits as an artist. After eighteen months he returned to England, and on the very day of his arrival was chosen president of the Academy in room of West, who had died a few days before. This office he held from 1820 to his death on the 7th of January 1830. He was never married.

Sir Thomas Lawrence had all the qualities of personal manner and artistic style necessary to make a fashionable painter, and among English portrait painters he takes a high place, though not as high as that given to him in his lifetime. His more ambitious works, in the classical style, such as his once celebrated "Satan," are practically forgotten.

The best display of Lawrence's work is in the Waterloo Gallery of Windsor, a collection of much historical interest. "Master Lambton," painted for Lord Durham at the price of 600 guineas, is regarded as one of his best portraits, and a fine head in the National Gallery, London, shows his power to advantage. The *Life and Correspondence of Sir T. Lawrence*, by D. E. Williams, appeared in 1831.

LAWRENCE, a city and the county-seat of Douglas county, Kansas, U.S.A., situated on both banks of the Kansas river, about 40 m. W. of Kansas City. Pop. (1890) 9997, (1900) 10,862, of whom 2032 were negroes, (1910 census) 12,374. It is served by the Atchison, Topeka & Santa Fe and the Union Pacific railways, both having tributary lines extending N. and S. Lawrence is surrounded by a good farming region, and is itself a thriving educational

and commercial centre. Its site slopes up from the plateau that borders the river to the heights above, from which there is a view of rare beauty. Among the city's principal public buildings are the court house and the Y.M.C.A. building. The university of Kansas, situated on Mount Oread, overlooking the city, was first opened in 1866, and in 1907-1908 had a faculty of 105 and 2063 students, including 702 women (see KANSAS). Just S. of the city of Lawrence is Haskell institute (1884), one of the largest Indian schools in the country, maintained for children of the tribal Indians by the national government. In 1907 the school had 813 students, of whom 313 were girls; it has an academic department, a business school and courses in domestic science, in farming, dairying and gardening, and in masonry, carpentry, painting, blacksmithing, waggon-making, shoemaking, steam-fitting, printing and other trades. Among the city's manufactures are flour and grist mill products, pianos and cement plaster. Lawrence, named in honour of Amos A. Lawrence, was founded by agents of the Massachusetts Emigrant Aid Company in July 1854, and during the Territorial period was the political centre of the free-state cause and the principal point against which the assaults of the pro-slavery party were directed. It was first known as Wakarusa, from the creek by which it lies. A town association was organized in September 1854 before any Territorial government had been established. In the next month some pro-slavery men presented claims to a part of the land, projected a rival town to be called Excelsior on the same site, and threatened violence; but when Lawrence had organized its "regulators" the pro-slavery men retired and later agreed to a compromise by which the town site was limited to 640 acres. In December 1855 occurred the "Wakarusa war." A free-state man having been murdered for his opinions, a friend who threatened retaliation was arrested by the pro-slavery sheriff, S. J. Jones; he was rescued and taken to Lawrence; the city disclaimed complicity, but Jones persuaded Governor Wilson Shannon that there was rebellion, and Shannon authorized a posse; Missouri responded, and a pro-slavery force marched on Lawrence. The governor found that Lawrence had not resisted and would not resist the service of writs; by a written "agreement" with the free-state leaders he therefore withdrew his sanction from the Missourians and averted battle. The retreating Missourians committed some homicides. It was during this "war" that John Brown first took up arms with the free-state men. Preparations for another attack continued, particularly after Sheriff Jones, while serving writs in Lawrence, was wounded. On the 21st of May 1856, at the head of several hundred Missourians, he occupied the city without resistance, destroyed its printing offices and the free-state headquarters and pillaged private houses. In 1855 and again in 1857 the pro-slavery Territorial legislature passed an Act giving Lawrence a charter, but the people of Lawrence would not recognize that "bogus" government, and on the 13th of July 1857, after an application to the Topeka free-state legislature for a charter had been denied, adopted a city charter of their own. Governor Walker proclaimed this rebellion against the United States, appeared before the town in command of 400 United States dragoons and declared it under martial law; as perfect order prevailed, and there was no overt resistance to Territorial law, the troops were withdrawn after a few weeks by order of President Buchanan, and in February 1858 the legislature passed an Act legalizing the city charter of July 1857. On the 21st of August 1863 William C. Quantrell and some 400 mounted Missouri bushrangers surprised the sleeping town and murdered 150 citizens. The city's arms were in storage and no resistance was possible. This was the most distressing episode in all the turbulence of territorial days and border warfare in Kansas. A monument erected in 1895 commemorates the dead. After the free-state men gained control of the Territorial legislature in 1857 the legislature regularly adjourned from Lecompton, the legal capital, to Lawrence, which was practically the capital until the choice of Topeka under the Wyandotte constitution. The first railway to reach Lawrence was the Union Pacific in 1864.



See F. W. Blackmar, "The Annals of an Historic Town," in the *Annual Report* of the American Historical Association for 1893 (Washington, 1894).

**LAWRENCE,** a city, and one of the three county-seats (Salem and Newburyport are the others) of Essex county, Massachusetts, U.S.A., on both sides of the Merrimac river, about 30 m. from its mouth and about 26 m. N.N.W. of Boston. Pop. (1890) 44,654, (1900) 62,559, of whom 28,577 were foreign-born (7058 being Irish, 6999 French Canadians, 5131 English, 2465 German, 1683 English Canadian), and (1910 census) 85,892. It is served by

the Boston & Maine railroad and by electric railways to Andover, Boston, Lowell, Haverhill and Salem, Massachusetts, and to Nashua and Salem, New Hampshire. The city's area of 6.54 sq. m. is about equally divided by the Merrimac, which is here crossed by a great stone dam 900 ft. long, and, with a fall of 28 ft., supplies about 12,000 horsepower. Water from the river is carried to factories by a canal on each side of the river and parallel to it; the first canal was built on the north side in 1845-1847 and is 1 m. long; the canal on the south side is about ¾ m. long, and was built several years later. There are large and well-kept public parks, a common (17 acres) with a soldiers' monument, a free public library, with more than 50,000 volumes in 1907, a city hall, county and municipal court-houses, a county gaol and house of correction, a county industrial school and a state armoury.

The value of the city's factory product was $48,036,593 in 1905, $41,741,980 in 1900. The manufacture of textiles is the most important industry; in 1905 the city produced worsteds valued at $30,926,964 and cotton goods worth $5,745,611, the worsted product being greater than that of any other American city. The Wood worsted mill here is said to be the largest single mill in the world. The history of Lawrence is largely the history of its textile mills. The town was formed in 1845 from parts of Andover (S. of the Merrimac) and of Methuen (N. of the river), and it was incorporated as a town in 1847, being named in honour of Abbott Lawrence, a director of the Essex company, organized in 1845 (on the same day as the formation of the town) for the control of the water power and for the construction of the great dam across the Merrimac. The Bay State woollen mills, which in 1858 became the Washington mills, and the Atlantic cotton mills were both chartered in 1846. The Pacific mills (1853) introduced from England in 1854 Lister combs for worsted manufacture; and the Washington mills soon afterward began to make worsted dress goods. Worsted cloths for men's wear seem to have been made first about 1870 at nearly the same time in the Washington mills here, in the Hockanum mills of Rockville, Connecticut, and in Wanskuck mills, Providence, Rhode Island. The Pemberton mills, built in 1853, collapsed and afterwards took fire on the 10th of January 1860; 90 were killed and hundreds severely injured. Lawrence was chartered as a city in 1853, and annexed a small part of Methuen in 1854 and parts of Andover and North Andover in 1879.

See H. A. Wadsworth, *History of Lawrence, Massachusetts* (Lawrence, 1880).

LAWRENCEBURG, a city and the county-seat of Dearborn county, Indiana, U.S.A., on the Ohio river, in the S.E. part of the state, 22 m. (by rail) W. of Cincinnati. Pop. (1890) 4284, (1900) 4326 (413 foreign-born); (1910) 3930. Lawrenceburg is served by the Baltimore & Ohio South-Western and the Cleveland, Cincinnati, Chicago & St Louis railways, by the Cincinnati, Lawrenceburg & Aurora electric street railroad, and by river packets to Louisville and Cincinnati. The city lies along the river and on higher land rising 100 ft. above river-level. It formerly had an important river trade with New Orleans, beginning about 1820 and growing in volume after the city became the terminus of the Whitewater canal, begun in 1836. The place was laid out in 1802. In 1846 an "old" and a "new" settlement were united, and Lawrenceburg was chartered as a city. Lawrenceburg was the birthplace of James B. Eads, the famous engineer, and of John Coit Spooner (b. 1843), a prominent Republican member of the United States Senate from Wisconsin in 1885-1891 and in 1897-1907; and the Presbyterian Church of Lawrenceburg was the first charge (1837-1839) of Henry Ward Beecher.

LAWSON, CECIL GORDON (1851-1882), English landscape painter, was the youngest son of William Lawson of Edinburgh, esteemed as a portrait painter. His mother also was known for her flower pieces. He was born near Shrewsbury on the 3rd of December

1851. Two of his brothers (one of them, Malcolm, a clever musician and song-writer) were trained as artists, and Cecil was from childhood devoted to art with the intensity of a serious nature. Soon after his birth the Lawsons moved to London. Lawson's first works were studies of fruit, flowers, &c., in the manner of W. Hunt; followed by riverside Chelsea subjects. His first exhibit at the Royal Academy (1870) was "Cheyne Walk," and in 1871 he sent two other Chelsea subjects. These gained full recognition from fellow-artists, if not from the public. Among his friends were now numbered Fred Walker, G. J. Pinwell and their associates. Following them, he made a certain number of drawings for wood-engraving. Lawson's Chelsea pictures had been painted in somewhat low and sombre tones; in the "Hymn to Spring" of 1872 (rejected by the Academy) he turned to a more joyous play of colour, helped by work in more romantic scenes in North Wales and Ireland. Early in 1874 he made a short tour in Holland, Belgium and Paris; and in the summer he painted his large "Hop Gardens of England." This was much praised at the Academy of 1876. But Lawson's triumph was with the great luxuriant canvas "The Minister's Garden," exhibited in 1878 at the Grosvenor Gallery, and now in the Manchester Art Gallery. This was followed by several works conceived in a new and tragic mood. His health began to fail, but he worked on. He married in 1879 the daughter of Birnie Philip, and settled at Haslemere. His later subjects are from this neighbourhood (the most famous being "The August Moon," now in the National Gallery of British Art) or from Yorkshire. Towards the end of 1881 he went to the Riviera, returned in the spring, and died at Haslemere on the 10th of June 1882. Lawson may be said to have restored to English landscape the tradition of Gainsborough, Crome and Constable, infused with an imaginative intensity of his own. Among English landscape painters of the latter part of the 19th century his is in many respects the most interesting name.



See E. W. Gosse, *Cecil Lawson, a Memoir* (1883); Heseltine Owen, "In Memoriam: Cecil Gordon Lawson," *Magazine of Art* (1894).

(L. B.)

LAWSON, SIR JOHN (d. 1665), British sailor, was born at Scarborough. Joining the parliamentary navy in 1642, he accompanied Penn to the Mediterranean in 1650, where he served for some time. In 1652 he served under Blake in the Dutch War and was present at the first action in the Downs and the battle of the Kentish Knock. At Portland, early in 1653, he was vice-admiral of the red, and his ship was severely handled. Lawson took part in the battles of June and July in the following summer. In 1654-1655 he commanded in the North Sea and the Channel. Appointed in January 1655-1656 as Blake's second-in-command, Lawson was a few weeks later summarily dismissed from his command, probably for political reasons. He was a Republican and Anabaptist, and therefore an enemy to Cromwell. It is not improbable that like Penn and others he was detected in correspondence with the exiled Charles II., who certainly hoped for his support. In 1657, along with Harrison and others, he was arrested and, for a short time, imprisoned for conspiring against Cromwell. Afterwards he lived at Scarborough until the fall of Richard Cromwell's government. During the troubled months which succeeded that event Lawson, flying his flag as admiral of the Channel fleet, played a marked political rôle. His ships escorted Charles to England, and he was soon afterwards knighted. Sent out in 1661 with Montagu, earl of Sandwich, to the Mediterranean, Lawson conducted a series of campaigns against the piratical states of the Algerian coast. Thence summoned to a command in the Dutch War, he was mortally wounded at Lowestoft. He died on the 29th of June 1665.

See Charnock, *Biographia navalis*, i. 20; Campbell, *Lives of the Admirals*, ii. 251; Penn, *Life of Sir William Penn*; Pepys, *Diary*.

LAWSON, SIR WILFRID, Bart. (1829-1906), English politician and temperance

leader, son of the 1st baronet (d. 1867), was born on the 4th of September 1829. He was always an enthusiast in the cause of total abstinence, and in parliament, to which he was first elected in 1859 for Carlisle, he became its leading spokesman. In 1864 he first introduced his Permissive Bill, giving to a two-thirds majority in any district a veto upon the granting of licences for the sale of intoxicating liquors; and though this principle failed to be embodied in any act, he had the satisfaction of seeing a resolution on its lines accepted by a majority in the House of Commons in 1880, 1881 and 1883. He lost his seat for Carlisle in 1865, but in 1868 was again returned as a supporter of Mr Gladstone, and was member till 1885; though defeated for the new Cockermouth division of Cumberland in 1885, he won that seat in 1886, and he held it till the election of 1900, when his violent opposition to the Boer War caused his defeat, but in 1903 he was returned for the Camborne division of Cornwall and at the general election of 1906 was once more elected for his old constituency in Cumberland. During all these years he was the champion of the United Kingdom Alliance (founded 1853), of which he became president. An extreme Radical, he also supported disestablishment, abolition of the House of Lords, and disarmament. Though violent in the expression of his opinions, Sir Wilfrid Lawson remained very popular for his own sake both in and out of the House of Commons; he became well known for his humorous vein, his faculty for composing topical doggerel being often exercised on questions of the day. He died on the 1st of July 1906.

LAY, a word of several meanings. Apart from obsolete and dialectical usages, such as the East Anglian word meaning “pond,” possibly cognate with Lat. *lacus*, pool or lake, or its use in weaving for the batten of a loom, where it is a variant form of “lath,” the chief uses are as follows: (1) A song or, more accurately, a short poem, lyrical or narrative, which could be sung or accompanied by music; such were the romances sung by minstrels. Such an expression as the “Lay of the Nibelungen” is due to mistaken association of the word with Ger. *Lied*, song, which appears in Anglo-Saxon as *léoð*. “Lay” comes from O. Fr. *lai*, of which the derivation is doubtful. The *New English Dictionary* rejects Celtic origins sometimes put forward, such as Ir. *laoidh*, Welsh *llais*, and takes O. Mid. and High Ger. *leich* as the probable source. (2) “Non-clerical” or “unlearned.” In this sense “lay” comes directly from Fr. *lai* (*laïque*, the learned form nearer to the Latin, is now used) from Lat. *laicus*, Gr. λαϊκός, of or belonging to the people (λαός, Attic λεώς). The word is now specially applied to persons who are not in orders, and more widely to those who do not belong to other learned professions, particularly the law and medicine. The *New English Dictionary* quotes two examples from versions of the Bible. In the Douai version of 1 Sam. xxi. 4, Ahimelech tells David that he has “no lay bread at hand but only holy bread”; here the Authorized Version has “common bread,” the Vulgate *laicos panes*. In Coverdale’s version of Acts iv. 13, the high priest and his kindred marvel at Peter and John as being “unlearned and lay people”; the Authorized Version has “unlearned and ignorant men.” In a cathedral of the Church of England “lay clerks” and “lay vicars” sing such portions of the service as may be performed by laymen and clergy in minor orders. “Lay readers” are persons who are granted a commission by the bishop to perform certain religious duties in a particular parish. The commission remains in force until it is revoked by the bishop or his successors, or till there is a new incumbent in the parish, when it has to be renewed. In a religious order a “lay brother” is freed from duties at religious services performed by the other members, and from their studies, but is bound by vows of obedience and chastity and serves the order by manual labour. For “lay impropriator” see Appropriation, and for “lay rector” see Rector and Tithes; see further Laymen, House of. (3) “Lay” as a verb means “to make to lie down,” “to place upon the ground,” &c. The past tense is “laid”; it is vulgarly confused with the verb “to lie,” of which the past is “lay.” The common root of both “lie” and “lay” is represented by O. Teut. *leg*; cf. Dutch *leggen*, Ger. *legen*, and Eng. “ledge.”[1] (4) “Lay-figure” is the name commonly given to articulated figures of human beings or animals, made of wood, papier-maché or other materials; draped and posed, such figures serve as models for artists (see Models, Artists). The word has no connexion with “to lay,” to place in position, but is an adaptation of the word “layman,” commonly used with this meaning in the 18th century. This was adapted from Dutch *leeman* (the older form is *ledenman*) and meant an “articulated or jointed man” from *led*, now *lid*, a joint; cf. Ger. *Gliedermann*.

1 The verb “to lie,” to speak falsely, to tell a falsehood, is in O. Eng. *léogan*; it appears in most Teutonic languages, *e.g.* Dutch *lugen*, Ger. *lügen*.

LAYA, JEAN LOUIS (1761-1833), French dramatist, was born in Paris on the 4th of December 1761 and died in August 1833. He wrote his first comedy in collaboration with Gabriel M. J. B. Legouvé in 1785, but the piece, though accepted by the Comédie Française, was never represented. In 1789 he produced a plea for religious toleration in the form of a five-act tragedy in verse, *Jean Calas*; the injustice of the disgrace cast on a family by the crime of one of its members formed the theme of *Les Dangers de l’opinion* (1790); but it is by his *Ami des lois* (1793) that Laya is remembered. This energetic protest against mob-rule, with its scarcely veiled characterizations of Robespierre as Nomophage and of Marat as Duricrâne, was an act of the highest courage, for the play was produced at the Théâtre Français (temporarily Théâtre de la Nation) only nineteen days before the execution of Louis XVI. Ten days after its first production the piece was prohibited by the commune, but the public demanded its representation; the mayor of Paris was compelled to appeal to the convention, and the piece was played while some 30,000 Parisians guarded the hall. Laya went into hiding, and several persons convicted of having a copy of the obnoxious play in their possession were guillotined. At the end of the Terror Laya returned to Paris. In 1813 he replaced Delille in the Paris chair of literary history and French poetry; he was admitted to the Academy in 1817. Laya produced in 1797 *Les Deux Stuarts*, and in 1799 *Falkland*, the title-rôle of which provided Talma with one of his finest opportunities. Laya’s works, which chiefly owe their interest to the circumstances attending their production, were collected in 1836-1837.



See *Notice biographique sur J. L. Laya* (1833); Ch. Nodier, *Discours de réception*, 26th December (1833); Welschinger, *Théâtre de la révolution* (1880).

LAYAMON, early English poet, was the author of a chronicle of Britain entitled *Brut*, a paraphrase of the *Brut d’Angleterre* by Wace, a native of Jersey, who is also known as the author of the *Roman de Rou*. The excellent edition of Layamon by Sir F. Madden (Society of Antiquaries, London, 1847) should be consulted. All that is known concerning Layamon is derived from two extant MSS., which present texts that often vary considerably, and it is necessary to understand their comparative value before any conclusions can be drawn. The older text (here called the A-text) lies very near the original text, which is unfortunately lost, though it now and then omits lines which are absolutely necessary to the sense. The later text (here called the B-text) represents a later recension of the original version by another writer who frequently omits couplets, and alters the language by the substitution of better-known words for such as seemed to be obsolescent; *e.g. harme* (harm) in place of *balewe* (bale), and *dead* in place of *feie* (fated to die, or dead). Hence little reliance can be placed on the B-text, its chief merit being that it sometimes preserves couplets which seem to have been accidentally omitted in A; besides which, it affords a valuable commentary on the original version.

We learn from the brief prologue that Layamon was a priest among the people, and was the son of Leovenath (a late spelling of A.-S. Leofnoth); also, that he lived at Ernley, at a noble church on Severn bank, close by Radstone. This is certainly Areley Regis, or Areley Kings, close by Redstone rock and ferry, 1 m. to the S. of Stourport in Worcestershire. The B-text turns Layamon into the later form Laweman, *i.e.* Law-man, correctly answering to Chaucer’s “Man of Lawe,” though here apparently used as a mere name. It also turns Leovenath into Leuca, *i.e.* Leofeca, a diminutive of Leofa, which is itself a pet-name for Leofnoth; so that there is no real contradiction. But it absurdly substitutes “with the good knight,” which is practically meaningless, for “at a noble church.”

We know no more about Layamon except that he was a great lover of books; and that he procured three books in particular which he prized above others, “turning over the leaves, and beholding them lovingly.” These were: the English book that St Beda made; another in Latin that St Albin and St Austin made; whilst the third was made by a French clerk named Wace, who (in 1155) gave a copy to the noble Eleanor, who was queen of the high king Henry (*i.e.* Henry II.).

The first of these really means the Anglo-Saxon translation of Beda’s *Ecclesiastical History*, which begins with the words: “Ic Beda, Cristes theow,” *i.e.* “I, Beda, Christ’s servant.” The second is a strange description of the original of the translation, *i.e.* Albinus Beda’s own Latin book, the second paragraph of which begins with the words: “Auctor ante omnes atque adiutor opusculi huius Albinus Abba reverentissimus vir per omnia doctissimus extitit”; which Layamon evidently misunderstood. As to the share of St Augustine in this work, see Book I., chapters 23-34, and Book II., chapters 1 and 2, which are practically all concerned with him and occupy more than a tenth of the whole work. The third book was Wace’s poem, *Brut d’Angleterre*. But we find that although Layamon had ready access to all three of these works, he soon settled down to the translation of the third, without troubling much about the others. His chief obligation to Beda is for the well-known story about Pope Gregory and the English captives at Rome; see Layamon, vol. iii. 180.

It is impossible to enter here upon a discussion of the numerous points of interest which a proper examination of this vast and important work would present to any careful inquirer. Only a few bare results can be here enumerated. The A-text may be dated about 1205, and the B-text (practically by another writer) about 1275. Both texts, the former especially, are remarkably free from admixture with words of French origin; the lists that have been given hitherto are inexact, but it may be said that the number of French words in the A-text can hardly exceed 100, or in the B-text 160. Layamon’s work is largely original; Wace’s *Brut* contains 15,300 lines, and Layamon’s 32,240 lines of a similar length; and many of Layamon’s additions to Wace are notable, such as his story “regarding the fairy elves at Arthur’s birth, and his transportation by them after death in a boat to Avalon, the abode of Argante, their queen”; see Sir F. Madden’s pref. p. xv. Wace’s *Brut* is almost wholly a translation of the Latin chronicle concerning the early history of Britain by Geoffrey of Monmouth, who said that he obtained his materials from a manuscript written in Welsh. The name Brut is the French form of Brutus, who was the fabulous grandson of Ascanius, and great-grandson of Aeneas of Troy, the hero of Virgil’s *Aeneid*. After many adventures, this Brutus arrived in England, founded Troynovant or New Troy (better known as London), and was the progenitor of a long line of British kings, among whom were Locrine, Bladud, Leir, Gorboduc, Ferrex and Porrex, Lud, Cymbeline, Constantine, Vortigern, Uther and Arthur; and from this mythical Brutus the name Brut was transferred so as to denote the entire chronicle of this British history. Layamon gives the whole story, from the time of Brutus to that of Cadwalader, who may be identified with the Caedwalla of the *Anglo-Saxon Chronicle*, baptized by Pope Sergius in the year 688. Both texts of Layamon are in a south-western dialect; the A-text in particular shows the Wessex dialect of earlier times (commonly called Anglo-Saxon) in a much later form, and we can hardly doubt that the author, as he intimates, could read the old version of Beda intelligently. The remarks upon the B-text in Sir F. Madden’s preface are not to the point; the peculiar spellings to which he refers (such as *same* for *shame*) are by no means due to any confusion with the Northumbrian dialect, but rather to the usual vagaries of a scribe who knew French better than English, and had some difficulty in acquiring the English pronunciation and in representing it accurately. At the same time, he was not strong in English grammar, and was apt to confuse the plural form with the singular in the tenses of verbs; and this is the simple explanation of most of the examples of so-called “nunnation” in this poem (such as the use of *wolden* for *wolde*), which only existed in writing and must not be seriously considered as representing real spoken sounds. The full proof of this would occupy too much space; but it should be noticed that, in many instances, “this pleonastic *n* has been struck out or erased by a second hand.” In other instances it has escaped notice, and that is all that need be said. The peculiar metre of the poem has been sufficiently treated by J. Schipper. An abstract of the poem has been given by Henry Morley; and good general criticisms of it by B. ten Brink and others.

See *Layamon’s Brut, or a Chronicle of Britain*; *a Poetical Semi-Saxon Paraphrase of the Brut of Wace; ...* by Sir F. Madden (1847); B. ten Brink, *Early English Literature*, trans. by H. M. Kennedy (in Bonn’s Standard Library, 1885); H. Morley, *English Writers*, vol. iii. (1888); J. Schipper, *Englische Metrik*, i. (Bonn, 1882), E. Guest, *A History of English Rhythms* (new ed. by W. W. Skeat, 1882), Article “Layamon,” in the *Dict. Nat. Biog.; Six Old English Chronicles*, including Gildas, Nennius and Geoffrey of Monmouth (in Bohn’s Antiquarian Library); *Le Roux de Lincy, Le Roman de Brut, par Wace, avec un commentaire et des notes*

(Rouen, 1836-1838), E. Mätzner, *Altenglische Sprachproben* (Berlin, 1867).

(W. W. S.)



**LAYARD, SIR AUSTEN HENRY** (1817-1894), British author and diplomatist, the excavator of Nineveh, was born in Paris on the 5th of March 1817. The Layards were of Huguenot descent. His father, Henry P. J. Layard, of the Ceylon Civil Service, was the son of Charles Peter Layard, dean of Bristol, and grandson of Daniel Peter Layard, the physician. Through his mother, a daughter of Nathaniel Austen, banker, of Ramsgate, he inherited Spanish blood. This strain of cosmopolitanism must have been greatly strengthened by the circumstances of his education. Much of his boyhood was spent in Italy, where he received part of his schooling, and acquired a taste for the fine arts and a love of travel; but he was at school also in England, France and Switzerland. After spending nearly six years in the office of his uncle, Benjamin Austen, a solicitor, he was tempted to leave England for Ceylon by the prospect of obtaining an appointment in the civil service, and he started in 1839 with the intention of making an overland journey across Asia. After wandering for many months, chiefly in Persia, and having abandoned his intention of proceeding to Ceylon, he returned in 1842 to Constantinople, where he made the acquaintance of Sir Stratford Canning, the British ambassador, who employed him in various unofficial diplomatic missions in European Turkey. In 1845, encouraged and assisted by Canning, Layard left Constantinople to make those explorations among the ruins of Assyria with which his name is chiefly associated. This expedition was in fulfilment of a design which he had formed, when, during his former travels in the East, his curiosity had been greatly excited by the ruins of Nimrud on the Tigris, and by the great mound of Kuyunjik, near Mosul, already partly excavated by Botta. Layard remained in the neighbourhood of Mosul, carrying on excavations at Kuyunjik and Nimrud, and investigating the condition of various tribes, until 1847; and, returning to England in 1848, published *Nineveh and its Remains: with an Account of a Visit to the Chaldaean Christians of Kurdistan, and the Yezidis, or Devil-worshippers; and an Inquiry into the Manners and Arts of the Ancient Assyrians* (2 vols., 1848-1849). To illustrate the antiquities described in this work he published a large folio volume of *Illustrations of the Monuments of Nineveh* (1849). After spending a few months in England, and receiving the degree of D.C.L. from the university of Oxford, Layard returned to Constantinople as attaché to the British embassy, and, in August 1849, started on a second expedition, in the course of which he extended his investigations to the ruins of Babylon and the mounds of southern Mesopotamia. His record of this expedition, *Discoveries in the Ruins of Nineveh and Babylon*, which was illustrated by another folio volume, called *A Second Series of the Monuments of Nineveh*, was published in 1853. During these expeditions, often in circumstances of great difficulty, Layard despatched to England the splendid specimens which now form the greater part of the collection of Assyrian antiquities in the British Museum. Apart from the archaeological value of his work in identifying Kuyunjik as the site of Nineveh, and in providing a great mass of materials for scholars to work upon, these two books of Layard's are among the best-written books of travel in the language.

Layard now turned to politics. Elected as a Liberal member for Aylesbury in 1852, he was for a few weeks under-secretary for foreign affairs, but afterwards freely criticized the government, especially in connexion with army administration. He was present in the Crimea during the war, and was a member of the committee appointed to inquire into the conduct of the expedition. In 1855 he refused from Lord Palmerston an office not connected with foreign affairs, was elected lord rector of Aberdeen university, and on 15th June moved a resolution in the House of Commons (defeated by a large majority) declaring that in public appointments merit had been sacrificed to private influence and an adherence to routine. After being defeated at Aylesbury in 1857, he visited India to investigate the causes of the Mutiny. He unsuccessfully contested York in 1859, but was elected for Southwark in 1860, and from 1861 to 1866 was under-secretary for foreign affairs in the successive administrations of Lord Palmerston and Lord John Russell. In 1866 he was appointed a trustee of the British Museum, and in 1868 chief commissioner of works in W. E. Gladstone's government and a member of the Privy Council. He retired from parliament in 1869, on being sent as envoy extraordinary to Madrid. In 1877 he was appointed by Lord Beaconsfield ambassador at Constantinople, where he remained until Gladstone's return to power in 1880, when he finally retired from public life. In 1878, on the occasion of the Berlin

conference, he received the grand cross of the Bath. Layard's political life was somewhat stormy. His manner was brusque, and his advocacy of the causes which he had at heart, though always perfectly sincere, was vehement to the point sometimes of recklessness. Layard retired to Venice, where he devoted much of his time to collecting pictures of the Venetian school, and to writing on Italian art. On this subject he was a disciple of his friend G. Morelli, whose views he embodied in his revision of F. Kugler's *Handbook of Painting, Italian Schools* (1887). He wrote also an introduction to Miss Ffoulkes's translation of Morelli's *Italian Painters* (1892-1893), and edited that part of Murray's *Handbook of Rome* (1894) which deals with pictures. In 1887 he published, from notes taken at the time, a record of his first journey to the East, entitled *Early Adventures in Persia, Susiana and Babylonia*. An abbreviation of this work, which as a book of travel is even more delightful than its predecessors, was published in 1894, shortly after the author's death, with a brief introductory notice by Lord Aberdare. Layard also from time to time contributed papers to various learned societies, including the Huguenot Society, of which he was first president. He died in London on the 5th of July 1894.

(A. Gl.)

LAYMEN, HOUSES OF, deliberative assemblies of the laity of the Church of England, one for the province of Canterbury, and the other for the province of York. That of Canterbury was formed in 1886, and that of York shortly afterwards. They are merely consultative bodies, and the primary intention of their foundation was to associate the laity in the deliberations of convocation. They have no legal status. The members are elected by the various diocesan conferences, which are in turn elected by the laity of their respective parishes or rural deaneries. Ten members are appointed for the diocese of London, six for each of the dioceses of Winchester, Rochester, Lichfield and Worcester; and four for each of the remaining dioceses. The president of each house has the discretionary power of appointing additional laymen, not exceeding ten in number.

LAYNEZ (or Lainez), DIEGO (1512-1565), the second general of the Society of Jesus, was born in Castile, and after studying at Alcala joined Ignatius of Loyola in Paris, being one of the six who with Loyola in August 1534 took the vow of missionary work in Palestine in the Montmartre church. This plan fell through, and Laynez became professor of scholastic theology at Sapienza. After the order had been definitely established (1540) Laynez was sent to Germany. He was one of the pope's theologians at the council of Trent (*q.v.*), where he played a weighty and decisive part. When Loyola died in 1556 Laynez acted as vicar of the society, and two years later became general. Before his death at Rome, on the 19th of January 1565, he had immensely strengthened the despotic constitution of the order and developed its educational activities (see Jesuits).

His *Disputationes Tridentinae* were published in 2 volumes in 1886. Lives by Michel d'Esne (Douai, 1597) and Pet. Ribadeneira (Madrid, 1592; Lat. trans. by A. Schott, Antwerp, 1598). See also H. Müller, *Les Origines de la Compagnie de Jésus: Ignace et Lainez* (1898).

LAZAR, one afflicted with the disease of leprosy (*q.v.*). The term is an adaptation in medieval Latin of the name of Lazarus (*q.v.*), in Luke xvi. 20, who was supposed to be a

leper. The word was not confined to persons suffering from leprosy; thus Caxton (*The Life of Charles the Great*, 37), “there atte laste were guarysshed and heled viij lazars of the palesey.”

Lazaretto or Lazar-House is a hospital for the reception of poor persons suffering from the plague, leprosy or other infectious or contagious diseases. A peculiar use of “lazaretto” is found in the application of the term, now obsolete, to a place in the after-part of a merchant vessel for the storage of provisions, &c. *Lazzarone*, a name now often applied generally to beggars, is an Italian term, particularly used of the poorest class of Neapolitans, who, without any fixed abode, live by odd jobs and fishing, but chiefly by begging.



LAZARITES (Lazarists or Lazarians), the popular names of the “Congregation of Priests of the Mission” in the Roman Catholic Church. It had its origin in the successful mission to the common people conducted by St Vincent de Paul (*q.v.*) and five other priests on the estates of the Gondi family. More immediately it dates from 1624, when the little community acquired a permanent settlement in the collège des Bons Enfans in Paris. Archiepiscopal recognition was obtained in 1626; by a papal bull of the 12th of January 1632, the society was constituted a congregation, with St Vincent de Paul at its head. About the same time the canons regular of St Victor handed over to the congregation the priory of St Lazarus (formerly a lazar-house) in Paris, whence the name of Lazarites or Lazarists. Within a few years they had acquired another house in Paris and set up other establishments throughout France; missions were also sent to Italy (1638), Tunis (1643), Algiers and Ireland (1646), Madagascar (1648) and Poland (1651). A fresh bull of Alexander VII. in April 1655 further confirmed the society; this was followed by a brief in September of the same year, regulating its constitution. The rules then adopted, which were framed on the model of those of the Jesuits, were published at Paris in 1668 under the title *Regulae seu constitutiones communes congregationis missionis*. The special objects contemplated were the religious instruction of the lower classes, the training of the clergy and foreign missions. During the French Revolution the congregation was suppressed and St Lazare plundered by the mob; it was restored by Napoleon in 1804 at the desire of Pius VII., abolished by him in 1809 in consequence of a quarrel with the pope, and again restored in 1816. The Lazarites were expelled from Italy in 1871 and from Germany in 1873. The Lazarite province of Poland was singularly prosperous; at the date of its suppression in 1796 it possessed thirty-five establishments. The order was permitted to return in 1816, but is now extinct there. In Madagascar it had a mission from 1648 till 1674. In 1783 Lazarites were appointed to take the place of the Jesuits in the Levantine and Chinese missions; they still have some footing in China, and in 1874 their establishments throughout the Turkish empire numbered sixteen. In addition, they established branches in Persia, Abyssinia, Mexico, the South American republics, Portugal, Spain and Russia, some of which have been suppressed. In the same year they had fourteen establishments in the United States of America. The total number of Lazarites throughout the world is computed at about 3000. Amongst distinguished members of the congregation may be mentioned: P. Collet (1693-1770), writer on theology and ethics; J. de la Grive (1689-1757), geographer; E. Boré (d. 1878), orientalist; P. Bertholon (1689-1757), physician; and Armand David, Chinese missionary and traveller.

See *Regulae seu constitutiones communes congregationis missionis* (Paris, 1668); *Mémoires de la congrégation de la mission* (1863); *Congrégation de la mission. Répertoire historique* (1900); *Notices bibliographiques sur les écrivains de la congrégation de la mission* (Angoulême, 1878); P. Hélyot, *Dict. des ordres religieux*, viii. 64-77; M. Heimbrecher, *Die Orden und Kongregationen der katholischen Kirche*, ii. (1897); C. Stork in Wetzer and Welte’s *Kirchenlexikon* (Catholic), vii.; E. Bougaud, *History of St Vincent de Paul* (1908).

LAZARUS (a contracted form of the Heb. name Eleazar, “God has helped,” Gr. Λάζαρος), a name which occurs in the New Testament in two connexions.

1. Lazarus of Bethany, brother of Martha and Mary. The story that he died and after four days was raised from the dead is told by John (xi., xii.) only, and is not mentioned by the Synoptists. By many this is regarded as the greatest of Christ’s miracles. It produced a great effect upon many Jews; the *Acta Pilati* says that Pilate trembled when he heard of it, and, according to Bayle’s *Dictionary*, Spinoza declared that if he were persuaded of its truth he would become a Christian. The story has been attacked more vigorously than any other portion of the Fourth Gospel, mainly on two grounds, (i.) the fact that, in spite of its striking character, it is omitted by the Synoptists, and (ii.) its unique significance. The personality of Lazarus in John’s account, his relation to Martha and Mary, and the possibility that John reconstructed the story by the aid of inferences from the story of the supper in Luke x. 40, and that of the anointing of Christ in Bethany given by Mark and Matthew, are among the chief problems. The controversy has given rise to a great mass of literature, discussions of which will be found in the lives of Christ, the biblical encyclopaedias and the commentaries on St John.

2. Lazarus is also the name given by Luke (xvi. 20) to the beggar in the parable known as that of “Lazarus and Dives,”[1] illustrating the misuse of wealth. There is little doubt that the name is introduced simply as part of the parable, and not with any idea of identifying the beggar with Lazarus of Bethany. It is curious, not only that Luke’s story does not appear in the other gospels, but also that in no other of Christ’s parables is a name given to the central character. Hence it was in early times thought that the story was historical, not allegorical (see Lazar).

1 The English Bible does not use Lat. *Dives* (rich) as a proper name, saying merely “a certain rich man.” The idea that Dives was a proper name arose from the Vulgate *quidam dives*, whence it became a conventional name for a rich man.

LAZARUS, EMMA (1849-1887), American Jewish poetess, was born in New York. When the Civil War broke out she was soon inspired to lyric expression. Her first book (1867) included poems and translations which she wrote between the ages of fourteen and seventeen. As yet her models were classic and romantic. At the age of twenty-one she published *Admetus and other Poems* (1871). *Admetus* is inscribed to Emerson, who greatly influenced her, and with whom she maintained a regular correspondence for several years. She led a retired life, and had a modest conception of her own powers. Much of her next work appeared in *Lippincott’s Magazine*, but in 1874 she published a prose romance (*Alide*) based on Goethe’s autobiography, and received a generous letter of admiration from Turgeniev. Two years later she visited Concord and made the acquaintance of the Emerson circle, and while there read the proof-sheets of her tragedy *The Spagnoletto*. In 1881 she published her excellent translations of Heine’s poems. Meanwhile events were occurring which appealed to her Jewish sympathies and gave a new turn to her feeling. The Russian massacres of 1880-1881 were a trumpet-call to her. So far her Judaism had been latent. She belonged to the oldest Jewish congregation of New York, but she had not for some years taken a personal part in the observances of the synagogue. But from this time she took up the cause of her race, and “her verse rang out as it had never rung before, a clarion note, calling a people to heroic action and unity; to the consciousness and fulfilment of a grand destiny.” Her poems, “The Crowing of the Red Cock” and “The Banner of the Jew” (1882) stirred the Jewish consciousness and helped to produce the new Zionism (*q.v.*). She now wrote another drama, the *Dance to Death*, the scene of which is laid in Nordhausen in the 14th century; it is based on the accusation brought against the Jews of poisoning the wells and thus causing the Black Death. The *Dance to Death* was included (with some translations of medieval Hebrew poems) in *Songs of a Semite* (1882), which she dedicated to George Eliot. In 1885 she visited Europe. She devoted much of the short remainder of her life to the cause of Jewish nationalism. In 1887 appeared *By the waters of Babylon*, which consists of a series of “prose poems,” full of prophetic fire. She died in New York on the 19th of November 1887. A sonnet by Emma Lazarus is engraved on a memorial tablet on the

colossal Bartholdi statue of Liberty, New York.

See article in the *Century Magazine*, New Series, xiv. 875 (portrait p. 803), afterwards prefixed as a *Memoir* to the collected edition of *The poems of Emma Lazarus* (2 vols., 1889).

(I. A.)

**LAZARUS, HENRY** (1815-1895), British clarinettist, was born in London on the 1st of January 1815, and was a pupil of Blizard, bandmaster of the Royal Military Asylum, Chelsea, and subsequently of Charles Godfrey, senior, bandmaster of the Coldstream Guards. He made his first appearance as a soloist at a concert of Mme Dulcken's, in April 1838, and in that year he was appointed as second clarinet to the Sacred Harmonic Society. From Willman's death in 1840 Lazarus was principal clarinet at the opera, and all the chief festivals and orchestral concerts. His beautiful tone, excellent phrasing and accurate execution were greatly admired. He was professor of the clarinet at the Royal Academy of Music from 1854 until within a short time of his death, and was appointed to teach his instrument at the Military School of Music, Kneller Hall, in 1858. His last public appearance was at a concert for his benefit in St James's Hall, in June 1892, and he died on the 6th of March 1895.



**LAZARUS, MORITZ** (1824-1903), German philosopher, was born on the 15th of September 1824 at Filehne, Posen. The son of a rabbinical scholar, he was educated in Hebrew literature and history, and subsequently in law and philosophy at the university of Berlin. From 1860 to 1866 he was professor in the university of Berne, and subsequently returned to Berlin as professor of philosophy in the kriegsakademie (1868) and later in the university of Berlin (1873). On the occasion of his seventieth birthday he was honoured with the title of *Geheimrath*. The fundamental principle of his philosophy was that truth must be sought not in metaphysical or a priori abstractions but in psychological investigation, and further that this investigation cannot confine itself successfully to the individual consciousness, but must be devoted primarily to society as a whole. The psychologist must study mankind from the historical or comparative standpoint, analysing the elements which constitute the fabric of society, with its customs, its conventions and the main tendencies of its evolution. This *Völkerpsychologie* (folk- or comparative psychology) is one of the chief developments of the Herbartian theory of philosophy; it is a protest not only against the so-called scientific standpoint of natural philosophers, but also against the individualism of the positivists. In support of his theory he founded, in combination with H. Steinthal, the *Zeitschrift für Völkerpsychologie und Sprachwissenschaft* (1859). His own contributions to this periodical were numerous and important. His chief work was *Das Leben der Seele* (Berlin, 1855-1857; 3rd edition, 1883). Other philosophical works were:—*Ueber den Ursprung der Sitten* (1860 and 1867), *Ueber die Ideen in der Geschichte* (1865 and 1872); *Zur Lehre von den Sinnestäuschungen* (1867); *Ideale Fragen* (1875 and 1885), *Erziehung und Geschichte* (1881); *Unser Standpunkt* (1881); *Ueber die Reize des Spiels* (1883). Apart from the great interest of his philosophical work, Lazarus was pre-eminent among the Jews of the so-called Semitic domination in Germany. Like Heine, Auerbach and Steinthal, he rose superior to the narrower ideals of the German Jews, and took a leading place in German literature and thought. He protested against the violent anti-Semitism of the time, and, in spite of the moderate tone of his publications, drew upon himself unqualified censure. He wrote in this connexion a number of articles collected in 1887 under the title *Treu und Frei. Reden und Vorträge über Juden und Judenthum*. In 1869 and 1871 he was president of the first and second Jewish Synods at Leipzig and Augsburg.

See R. Flint, *The Philosophy of History in Europe*; M. Brasch, *Gesammelte Essays und Characterköpfe zur neuen Philos. und Literatur*; E. Berliner, *Lazarus und die öffentliche Meinung*; M. Brasch, "Der Begründer de Völkerpsychologie," in *Nord et Sud*, (September

1894).

## LAZARUS, ST, ORDER OF,

a religious and military order founded in Jerusalem about the middle of the 12th century. Its primary object was the tending of the sick, especially lepers, of whom Lazarus (see LAZAR) was regarded as the patron. From the 13th century, the order made its way into various countries of Europe—Sicily, Lower Italy and Germany (Thuringia); but its chief centre of activity was France, where Louis IX. (1253) gave the members the lands of Boigny near Orleans and a building at the gates of Paris, which they turned into a lazar-house for the use of the lepers of the city. A papal confirmation was obtained from Alexander IV. in 1255. The knights were one hundred in number, and possessed the right of marrying and receiving pensions charged on ecclesiastical benefices. An eight-pointed cross was the insignia of both the French and Italian orders. The gradual disappearance of leprosy combined with other causes to secularize the order more and more. In Savoy in 1572 it was merged by Gregory XIII. (at the instance of Emanuel Philibert, duke of Savoy) in the order of St Maurice (see KNIGHTHOOD AND CHIVALRY: *Orders of Knighthood, Italy*). The chief task of this branch was the defence of the Catholic faith, especially against the Protestantism of Geneva. It continued to exist till the second half of the 19th century. In 1608 it was in France united by Henry IV. with the order of Notre-Dame du Mont-Carmel. It was treated with especial favour by Louis XIV., and the most brilliant period of its existence was from 1673 to 1691, under the marquis de Louvois. From that time it began to decay. It was abolished at the Revolution, reintroduced during the Restoration, and formally abolished by a state decree of 1830.

See L. Mainbourg, *Hist. des croisades* (1682; Eng. trans. by Nalson, 1686); P. Hélyot, *Hist. des ordres monastiques* (1714), pp. 257, 386; J. G. Uhlhorn, *Die christliche Liebesthätigkeit im Mittelalter* (Stuttgart, 1884); articles in Herzog-Hauck's *Realencyklopädie für protestantische Theologie*, xi. (1902) and Wetzer and Welte's (Catholic) *Kirchenlexikon*, vii. (1891).

## LEA, HENRY CHARLES

(1825-1909), American historian, was born at Philadelphia on the 19th of September 1825. His father was a publisher, whom in 1843 he joined in business, and he retained his connexion with the firm till 1880. Weak health, however, caused him from early days to devote himself to research, mainly on church history in the later middle ages, and his literary reputation rests on the important books he produced on this subject. These are: *Superstition and Force* (Philadelphia, 1866, new ed. 1892); *Historical Sketch of Sacerdotal Celibacy* (Philadelphia, 1867); *History of the Inquisition of the Middle Ages* (New York, 1888); *Chapters from the religious history of Spain connected with the Inquisition* (Philadelphia, 1890); *History of auricular Confession and Indulgences in the Latin Church* (3 vols., London, 1896); *The Moriscos of Spain* (Philadelphia, 1901), and *History of the Inquisition of Spain* (4 vols., New York and London, 1906-1907). He also edited a *Formulary of the Papal Penitentiary in the 13th century* (Philadelphia, 1892), and in 1908 was published his *Inquisition in the Spanish Dependencies*. As an authority on the Inquisition he stood in the highest rank of modern historians, and distinctions were conferred on him by the universities of Harvard, Princeton, Pennsylvania, Giessen and Moscow. He died at Philadelphia on the 24th of October 1909.

**LEAD** (pronounced *leed*), a city of Lawrence county, South Dakota, U.S.A., situated in the Black Hills, at an altitude of about 5300 ft., 3 m. S.W. of Deadwood. Pop. (1890) 2581, (1900) 6210, of whom 2145 were foreign-born, (1905) 8217, (1910) 8392. In 1905 it was second in population among the cities of the state. It is served by the Chicago, Burlington & Quincy, the Chicago & North-Western, and the Chicago, Milwaukee & St Paul railways. Lead has a hospital, the Hearst Free Library and the Hearst Free Kindergarten, and is the see of a Roman Catholic bishopric. It is the centre of the mining interests of the Black Hills, and the Homestake Gold Mine here contains perhaps the largest and most easily worked mass of low-grade ore and one of the largest mining plants (1000 stamps) in the world; it has also three cyanide mills. From 1878 to 1906 the value of the gold taken from this mine amounted to about $58,000,000, and the net value of the product of 1906 alone was approximately $5,313,516. For two months in the spring of 1907 the mine was rendered idle by a fire (March 25), which was so severe that it was necessary to flood the entire mine. Mining tools and gold jewelry are manufactured. The first settlement was made here by mining prospectors in July 1876. Lead was chartered as a city in 1890 and became a city of the first class in 1904.

**LEAD,** a metallic chemical element; its symbol is Pb (from the Lat. *plumbum*), and atomic weight 207.10 (O = 16). This metal was known to the ancients, and is mentioned in the Old Testament. The Romans used it largely, as it is still used, for the making of water pipes, and soldered these with an alloy of lead and tin. Pliny treats of these two metals as *plumbum nigrum* and *plumbum album* respectively, which seems to show that at his time they were looked upon as being only two varieties of the same species. In regard to the ancients' knowledge of lead compounds, we may state that the substance described by Dioscorides as μολυβδαίνα was undoubtedly litharge, that Pliny uses the word minium in its present sense of red lead, and that white lead was well known to Geber in the 8th century. The alchemists designated it by the sign of Saturn ♄.



*Occurrence.*—Metallic lead occurs in nature but very rarely and then only in minute amount. The chief lead ores are galena and cerussite; of minor importance are anglesite, pyromorphite and mimetesite (*qq.v.*). Galena (*q.v.*), the principal lead ore, has a world-wide distribution, and is always contaminated with silver sulphide, the proportion of noble metal varying from about 0.01 or less to 0.3%, and in rare cases coming up to ½ or 1%. Fine-grained galena is usually richer in silver than the coarse-grained. Galena occurs in veins in the Cambrian clay-slate, accompanied by copper and iron pyrites, zinc-blende, quartz, calc-spar, iron-spar, &c.; also in beds or nests within sandstones and rudimentary limestones, and in a great many other geological formations. It is pretty widely diffused throughout the earth's crust. The principal English lead mines are in Derbyshire; but there are also mines at Allandale and other parts of western Northumberland, at Alston Moor and other parts of Cumberland, in the western parts of Durham, in Swaledale and Arkendale and other parts of Yorkshire, in Salop, in Cornwall, in the Mendip Hills in Somersetshire, and in the Isle of Man. The Welsh mines are chiefly in Flint, Cardigan and Montgomery shires; the Scottish in Dumfries, Lanark and Argyll; and the Irish in Wicklow, Waterford and Down. Of continental mines we may mention those in Saxony and in the Harz, Germany; those of Carinthia, Austria; and especially those of the southern provinces of Spain. It is widely distributed in the United States, and occurs in Mexico and Brazil; it is found in Tunisia and Algeria, in the Altai Mountains and India, and in New South Wales, Queensland, and in Tasmania.

The native carbonate or cerussite (*q.v.*) occasionally occurs in the pure form, but more frequently in a state of intimate intermixture with clay ("lead earth," *Bleierde*), limestone, iron oxides, &c. (as in the ores of Nevada and Colorado), and some times also with coal ("black lead ore"). All native carbonate of lead seems to be derived from what was originally galena, which is always present in it as an admixture. This ore, metallurgically, was not reckoned of much value, until immense quantities of it were discovered in Nevada and in Colorado (U.S.). The Nevada mines are mostly grouped around the city of Eureka, where the ore occurs in "pockets" disseminated at random through limestone. The crude ore contains about 30% lead and 0.2 to 0.3% silver. The Colorado lead district is in the Rocky Mountains,

a few miles from the source of the Arkansas river. It forms gigantic deposits of almost constant thickness, embedded between a floor of limestone and a roof of porphyry. Stephens's discovery of the ore in 1877 was the making of the city of Leadville, which, in 1878, within a year of its foundation, had over 10,000 inhabitants. The Leadville ore contains from 24 to 42% lead and 0.1 to 2% silver. In Nevada and Colorado the ore is worked chiefly for the sake of the silver. Deposits are also worked at Broken Hill, New South Wales.

Anglesite, or lead sulphate, $PbSO_4$, is poor in silver, and is only exceptionally mined by itself; it occurs in quantity in France, Spain, Sardinia and Australia. Of other lead minerals we may mention the basic sulphate lanarkite, $PbO{\cdot}PbSO_4$; leadhillite, $PbSO_4{\cdot}3PbCO_3$; the basic chlorides matlockite, $PbO{\cdot}PbCl_2$, and mendipite, $PbCl_2{\cdot}2PbO$; the chloro-phosphate pyromorphite, $PbCl_2{\cdot}3Pb_3(PO_4)_2$, the chloro-arsenate mimetesite, $PbCl_2{\cdot}3Pb_3(AsO_4)_2$; the molybdate wulfenite, $PbMoO_4$; the chromate crocoite or crocoisite, $PbCrO_4$; the tungstate stolzite, $PbWO_4$.

*Production.*—At the beginning of the 19th century the bulk of the world's supply of lead was obtained from England and Spain, the former contributing about 17,000 tons and the latter 10,000 tons annually. Germany, Austria, Hungary, France, Russia and the United States began to rank as producers during the second and third decades; Belgium entered in about 1840; Italy in the 'sixties; Mexico, Canada, Japan and Greece in the 'eighties; while Australia assumed importance in 1888 with a production of about 18,000 tons, although it had contributed small and varying amounts for many preceding decades. In 1850 England headed the list of producers with about 66,000 tons; this amount had declined in 1872 to 61,000 tons. Since this date, it has, on the whole, diminished, although large outputs occurred in isolated years, for instance, a production of 40,000 tons in 1893 was followed by 60,000 tons in 1896 and 40,000 in 1897. The output in 1900 was 35,000 tons, and in 1905, 25,000 tons. Spain ranked second in 1850 with about 47,000 tons; this was increased in 1863, 1876 and in 1888 to 84,000, 127,000 and 187,000 tons respectively; but the maximum outputs mentioned were preceded and succeeded by periods of depression. In 1900 the production was 176,000 tons, and in 1905, 179,000 tons. The United States, which ranked third with a production of 20,000 tons in 1850, maintained this annual yield, until 1870, when it began to increase; the United States now ranks as the chief producer; in 1900 the output was 253,000 tons, and in 1905, 319,744 tons. Germany has likewise made headway; an output of 12,000 tons in 1850 being increased to 120,000 tons in 1900 and to 152,590 in 1905. This country now ranks third, having passed England in 1873. Mexico increased its production from 18,000 tons in 1883 to 83,000 tons in 1900 and about 88,000 tons in 1905. The Australian production of 18,000 tons in 1888 was increased to 58,000 tons in 1891, a value maintained until 1893, when a depression set in, only 21,000 tons being produced in 1897; prosperity then returned, and in 1898 the yield was 68,000 tons, and in 1905, 120,000 tons. Canada became important in 1895 with a production of 10,000 tons; this increased to 28,654 tons in 1900; and in 1905 the yield was 25,391 tons. Italy has been a fairly steady producer; the output in 1896 was 20,000 tons, and in 1905, 25,000 tons.

### *Metallurgy.*

The extraction of the metal from pure (or nearly pure) galena is the simplest of all metallurgical operations. The ore is roasted (*i.e.* heated in the presence of atmospheric oxygen) until all the sulphur is burned away and the lead left. This simple statement, however, correctly formulates only the final result. The first effect of the roasting is the elimination of sulphur as sulphur-dioxide, with formation of oxide and sulphate of lead. In practice this oxidation process is continued until the whole of the oxygen is as nearly as possible equal in weight to the sulphur present as sulphide or as sulphate, *i.e.* in the ratio S : $O_2$. The heat is then raised in (relative) absence of air, when the two elements named unite into sulphur-dioxide, while a regulus of molten lead remains. Lead ores are smelted in the reverberatory furnace, the ore-hearth, and the blast-furnace. The use of the first two is restricted, as they are suited only for galena ores or mixtures of galena and carbonate, which contain not less than 58% lead and not more than 4% silica; further, ores to be treated in the ore-hearth should run low in or be free from silver, as the loss in the fumes is excessive. In the blast-furnace all lead ores are successfully smelted. Blast-furnace treatment has therefore become more general than any other.

Three types of reverberatory practice are in vogue—the English, Carinthian and Silesian. In Wales and the south of England the process is conducted in a reverberatory furnace, the sole of which is paved with slags from previous operations, and has a depression in the middle where the metal formed collects to be let off by a tap-hole. The dressed ore is introduced through a "hopper" at the top, and exposed to a moderate oxidizing flame until a

certain proportion of ore is oxidized, openings at the side enabling the workmen to stir up the ore so as to constantly renew the surface exposed to the air. At this stage as a rule some rich slags of a former operation are added and a quantity of quicklime is incorporated, the chief object of which is to diminish the fluidity of the mass in the next stage, which consists in this, that, with closed air-holes, the heat is raised so as to cause the oxide and sulphate on the one hand and the sulphide on the other to reduce each other to metal. The lead produced runs into the hollow and is tapped off. The roasting process is then resumed, to be followed by another reduction, and so on.

A similar process is used in Carinthia; only the furnaces are smaller and of a somewhat different form. They are long and narrow; the sole is plane, but slopes from the fire-bridge towards the flue, so that the metal runs to the latter end to collect in pots placed *outside* the furnace. In Carinthia the oxidizing process from the first is pushed on so far that metallic lead begins to show, and the oxygen introduced predominates over the sulphur left. The mass is then stirred to liberate the lead, which is removed as *Rührblei*. Charcoal is now added, and the heat urged on to obtain *Pressblei*, an inferior metal formed partly by the action of the charcoal on the oxide of lead. The fuel used is fir-wood.

The Silesian furnace has an oblong hearth sloping from the fire-bridge to the flue-bridge. 316
This causes the lead to collect at the coolest part of the hearth, whence it is tapped, &c., as in the English furnace. While by the English and Carinthian processes as much lead as possible is extracted in the furnace, with the Silesian method a very low temperature is used, thus taking out about one-half of the lead and leaving very rich slags (50% lead) to be smelted in the blast-furnace, the ultimate result being a very much higher yield than by either of the other processes. The loss in lead by the combined reverberatory and blast-furnace treatment is only 3.2%.

In Cumberland, Northumberland, Durham and latterly the United States, the reverberatory furnace is used only for roasting the ore, and the oxidized ore is then reduced by fusion in a low, square blast-furnace (a “Scottish hearth furnace”) lined with cast iron, as is also the inclined sole-plate which is made to project beyond the furnace, the outside portion (the “work-stone”) being provided with grooves guiding any molten metal that may be placed on the “stone” into a cast iron pot; the “tuyère” for the introduction of the wind was, in the earlier types, about half way down the furnace.

As a preliminary to the melting process, the “browse” left in the preceding operation (half-fused and imperfectly reduced ore) is introduced with some peat and coal, and heated with the help of the blast. It is then raked out on the work-stone and divided into a very poor “grey” slag which is put aside, and a richer portion, which goes back into the furnace. Some of the roasted ore is strewed upon it, and, after a quarter of an hour’s working, the whole is taken out on the work-stone, where the lead produced runs off. The “browse,” after removal of the “grey” slag, is reintroduced, ore added, and, after a quarter of an hour’s heating, the mass again placed on the work-stone, &c.

In the more recent form of the hearth process the blocks of cast iron forming the sides and back of the Scottish furnace are now generally replaced in the United States by water-cooled shells (water-jackets) of cast iron. In this way continuous working has been rendered possible, whereas formerly operations had to be stopped every twelve or fifteen hours to allow the over-heated blocks and furnace to cool down. A later improvement (which somewhat changes the mode of working) is that by Moffett. While he also prevents interruption of the operation by means of water-jackets, he uses hot-blast, and produces, besides metallic lead, large volumes of lead fumes which are drawn off by fans through long cooling tubes, and then forced through suspended bags which filter off the dust, called “blue powder.” Thus, a mixture of lead sulphate (45%) and oxide (44%) with some sulphide (8%), zinc and carbonaceous matter, is agglomerated by a heap-roast and then smelted in a slag-eye furnace with grey slag from the ore-hearth. The furnace has, in addition to the usual tuyères near the bottom, a second set near the throat in order to effect a complete oxidation of all combustible matter. Much fume is thus produced. This is drawn off, cooled and filtered, and forms a white paint of good body, consisting of about 65% lead sulphate, 26% lead oxide, 6% zinc oxide and 3% other substances. Thus in the Moffett method it is immaterial whether metal or fume is produced, as in either case it is saved and the price is about the same.

In smelting at once in the same blast-furnace ores of different character, the old use of separate processes of precipitation, roasting and reduction, and general reduction prevailing in the Harz Mountains, Freiberg and other places, to suit local conditions, has been abandoned. Ores are smelted raw if the fall of matte (metallic sulphide) does not exceed 5%; otherwise they are subjected to a preliminary oxidizing roast to expel the sulphur, unless they run too high in silver, say 100 oz. to the ton, when they are smelted raw. The leading reverberatory furnace for roasting lead-bearing sulphide ores has a level hearth 14-16 ft.

wide and 60-80 ft. long. It puts through 9-12 tons of ore in twenty-four hours, reducing the percentage of sulphur to 2-4%, and requires four to six men and about 2 tons of coal. In many instances it has been replaced by mechanical furnaces, which are now common in roasting sulphide copper ores (see SULPHURIC ACID). A modern blast-furnace is oblong in horizontal section and about 24 ft. high from furnace floor to feed floor. The shaft, resting upon arches supported by four cast iron columns about 9 ft. high, is usually of brick, red brick on the outside, fire-brick on the inside; sometimes it is made of wrought iron water-jackets. The smelting zone always has a bosh and a contracted tuyère section. It is enclosed by water-jackets, which are usually cast iron, sometimes mild steel. The hearth always has an Arents siphon tap. This is an inclined channel running through the side-wall, beginning near the bottom of the crucible and ending at the top of the hearth, where it is enlarged into a basin. The crucible and the channel form the two limbs of an inverted siphon. While the furnace is running the crucible and channel remain filled with lead; all the lead reduced to the metallic state in smelting collects in the crucible, and rising in the channel, overflows into the basin, whence it is removed. The slag and matte formed float upon the lead in the crucible and are tapped, usually together, at intervals into slag-pots, where the heavy matter settles on the bottom and the light slag on the top. When cold they are readily separated by a blow from a hammer. The following table gives the dimensions of some well-known American lead-furnaces.

*Lead Blast-Furnace.*

| Locality. | Year. | Tuyère Section. | Height, Tuyère to Throat. |
|---|---|---|---|
| | | In. | Ft. |
| Leadville, Colorado | 1880 | 33 × 84 | 14 |
| Denver, Colorado | 1880 | 36 × 100 | 17 |
| Durango, Colorado | 1882 | 36 × 96 | 12.6 |
| Denver, Colorado | 1892 | 42 × 100 | 16 |
| Leadville, Colorado | 1892 | 42 × 120 | 18 |
| Salt Lake City, Utah | 1895 | 45 × 140 | 20 |

A furnace, 42 by 120 in. at the tuyères, with a working height of 17-20 ft., will put through in twenty-four hours, with twelve men, 12% coke and 2 ℔ blast-pressure, 85-100 tons average charge, *i.e.* one that is a medium coarse, contains 12-15% lead, not over 5% zinc, and makes under 5% matte. In making up a charge, the ores and fluxes, whose chemical compositions have been determined, are mixed so as to form out of the components not to be reduced to the metallic or sulphide state, typical slags (silicates of ferrous and calcium oxides, incidentally of aluminium oxide, which have been found to do successful work). Such slags contain $SiO_2$ = 30-33%, Fe(Mn)O = 27-50%, Ca(Mg, Ba)O = 12-28%, and retain less than 1% lead and 1 oz. silver to the ton. The leading products of the blast-furnace are argentiferous lead (base bullion), matte, slag and flue-dust (fine particles of charge and volatilized metal carried out of the furnace by the ascending gas current). The base bullion (assaying 300 ± oz. per ton) is desilverized (see below); the matte (Pb = 8-12%, Cu = 3-4%, Ag = ⅓-⅕ of the assay-value of the base bullion, rest Fe and S) is roasted and resmelted, when part of the argentiferous lead is recovered as base bullion, while the rest remains with the copper, which becomes concentrated in a copper-matte (60% copper) to be worked up by separate processes. The slag is a waste product, and the flue-dust, collected by special devices in dust-chambers, is briquetted by machinery, with lime as a bond, and then resmelted with the ore-charge. The yield in lead is over 90%, in silver over 97% and in gold 100%. The cost of smelting a ton of ore in Colorado in a single furnace, 42 by 120 in. at the tuyères, is about $3.

***Refining.***

The lead produced in the reverberatory furnace and the ore-hearth is of a higher grade than that produced in the blast-furnace, as the ores treated are purer and richer, and the reducing action is less powerful. The following analysis of blast-furnace lead of Freiberg, Saxony, is from an exceptionally impure lead: Pb = 95.088, Ag = 0.470, Bi = 0.019, Cu = 0.225, As = 1.826, Sb = 0.958, Sn = 1.354, Fe = 0.007, Zn = 0.002, S = 0.051. Of the impurities, most of the copper, nickel and copper, considerable arsenic, some antimony and small amounts of silver are removed by liquation. The lead is melted down slowly, when the impurities separate in the form of a scum (dross), which is easily removed. The purification by liquation is assisted by poling the lead when it is below redness. A stick of green wood is forced into it, and the vapours and gases set free expose new surfaces to the air, which at this temperature has only a mildly oxidizing effect. The pole, the use of which is awkward, has been replaced by dry stream, which has a similar effect. To remove tin, arsenic and antimony, the lead has to be brought

up to a bright-red heat, when the air has a strongly oxidizing effect. Tin is removed mainly as a powdery mixture of stannate of lead and lead oxide, arsenic and antimony as a slagged mixture of arsenate and antimonate of lead and lead oxide. They are readily withdrawn from the surface of the lead, and are worked up into antimony (arsenic)—tin-lead and antimony-lead alloys. Liquation, if not followed by poling, is carried on as a rule in a reverberatory furnace with an oblong, slightly trough-shaped inclined hearth; if the lead is to be poled it is usually melted down in a cast-iron kettle. If the lead is to be liquated and then brought to a bright-red heat, both operations are carried on in the same reverberatory furnace. This has an oblong, dish-shaped hearth of acid or basic fire-brick built into a wrought-iron pan, which rests on transverse rails supported by longitudinal walls. The lead is melted down at a low temperature and drossed. The temperature is then raised, and the scum which forms on the surface is withdrawn until pure litharge forms, which only takes place after all the tin, arsenic and antimony have been eliminated.

***Desilverizing.***

Silver is extracted from lead by means of the process of cupellation. Formerly all argentiferous lead had to be cupelled, and the resulting litharge then reduced to metallic lead. In 1833 Pattinson invented his process by means of which practically all the silver is concentrated in 13% of the original lead to be cupelled, while the rest becomes market lead. In 1842 Karsten discovered that lead could be desilverized by means of zinc. His invention, however, only took practical form in 1850-1852 through the researches of Parkes, who showed how the zinc-silver-lead alloy formed could be worked and the desilverized lead freed from the zinc it had taken up. In the Parkes process only 5% of the original lead need be cupelled. Thus, while cupellation still furnishes the only means for the final separation of lead and silver, it has become an auxiliary process to the two methods of concentration given. Of these the Pattinson process has become subordinate to the Parkes process, as it is more expensive and leaves more silver and impurities in the market lead. It holds its own, however, when base bullion contains bismuth in appreciable amounts, as in the Pattinson process bismuth follows the lead to be cupelled, while in the Parkes process it remains with the desilverized lead which goes to market, and lead of commerce should contain little bismuth. At Freiberg, Saxony, the two processes have been combined. The base bullion is imperfectly Pattinsonized, giving lead rich in silver and bismuth, which is cupelled, and lead low in silver, and especially so in bismuth, which is further desilverized by the Parkes process.



The effect of the two processes on the purity of the market lead is clearly shown by the two following analyses by Hampe, which represent lead from Lautenthal in the Harz Mountains, where the Parkes process replaced that of Pattinson, the ores and smelting process remaining practically the same:—

| Process. | Pb. | Cu. | Sb. | As. | Bi. | Ag. | Fe. | Zn. | Ni. |
|---|---|---|---|---|---|---|---|---|---|
| Pattinson | 99.966200 | 0.015000 | 1.010000 | none | 0.000600 | 0.002200 | 0.004000 | 0.001000 | 1.001000 |
| Parkes | 99.983139 | 0.001413 | 0.005698 | none | 0.005487 | 0.000460 | 0.002289 | 0.000834 | 0.000680 |

***Cupelling.***

The reverberatory furnace commonly used for cupelling goes by the name of the English cupelling furnace. It is oblong, and has a fixed roof and a movable iron hearth (test). Formerly the test was lined with bone-ash; at present the hearth material is a mixture of crushed limestone and clay (3:1) or Portland cement, either alone or mixed with crushed fire-brick; in a few instances the lining has been made of burnt magnesite. In the beginning of the operation enough argentiferous lead is charged to fill the cavity of the test. After it has been melted down and brought to a red heat, the blast, admitted at the back, oxidizes the lead and drives the litharge formed towards the front, where it is run off. At the same time small bars of argentiferous lead, inserted at the back, are slowly pushed forward, so that in melting down they may replace the oxidized lead. Thus the level of the lead is kept approximately constant, and the silver becomes concentrated in the lead. In large works the silver-lead alloy is removed when it contains 60-80% silver, and the cupellation of the rich bullion from several concentration furnaces is finished in a second furnace. At the same time the silver is brought to the required degree of fineness, usually by the use of nitre. In small works the cupellation is finished in one furnace, and the resulting low-grade silver fined in a plumbago crucible, either by overheating in the presence of air, or by the addition of silver sulphate to the melted silver, when air or sulphur trioxide and oxygen oxidize the impurities. The lead charged contains about 1.5% lead if it comes from a Pattinson plant, from 5-10% if from a Parkes plant. In a test 7 ft. by 4 ft. 10 in. and 4 in. deep, about 6 tons of lead are cupelled in twenty-four hours. A furnace is served by three men, working in eight-hour shifts, and requires about 2 tons of coal, which corresponds to about 110 gallons reduced oil, air being used as atomizer. The loss in lead is about 5%. The latest cupelling furnaces have the general form of a reverberatory copper-smelting furnace. The working door through which

the litharge is run off lies under the flue which carries off the products of combustion and the lead fumes, the lead is charged and the blast is admitted near the fire-bridge.

**Pattinson process.**

In the *Pattinson* process the argentiferous lead is melted down in the central cast iron kettle of a series 8-15, placed one next to the other, each having a capacity of 9-15 tons and a separate fire-place. The crystals of impoverished lead which fall to the bottom, upon coaling the charge, are taken out with a skimmer and discharged into the neighbouring kettle (say to the right) until about two-thirds of the original charge has been removed; then the liquid enriched lead is ladled into the kettle on the opposite side. To the kettle, two-thirds full of crystals of lead, is now added lead of the same tenor in silver, the whole is liquefied, and the cooling, crystallizing, skimming and ladling are repeated. The same is done with the kettle one-third filled with liquid lead, and so on until the first kettle contains market lead, the last cupelling lead. The intervening kettles contain leads with silver contents ranging from above market to below cupelling lead. The original Pattinson process has been in many cases replaced by the Luce-Rozan process (1870), which does away with arduous labour and attains a more satisfactory crystallization. The plant consists of two tilting oval metal pans (capacity 7 tons), one cylindrical crystallizing pot (capacity 22 tons), with two discharging spouts and one steam inlet opening, two lead moulds (capacity 3½ tons), and a steam crane. Pans and pot are heated from separate fire-places. Supposing the pot to be filled with melted lead to be treated, the fire is withdrawn beneath and steam introduced. This cools and stirs the lead when crystals begin to form. As soon as two-thirds of the lead has separated in the form of crystals, the steam is shut off and the liquid lead drained off through the two spouts into the moulds. The fire underneath the pot is again started, the crystals are liquefied, and one of the two pans, filled with melted lead, is tilted by means of the crane and its contents poured into the pot. In the meantime the lead in the moulds, which has solidified, is removed with the crane and stacked to one side, until its turn comes to be raised and charged into one of the pans. The crystallization proper lasts one hour, the working of a charge four hours, six charges being run in twenty-four hours.

**Parkes process.**

It is absolutely necessary for the success of the *Parkes* process that the zinc and lead should contain only a small amount of impurity. The spelter used must therefore be of a good grade, and the lead is usually first refined in a reverberatory furnace (the softening furnace). The capacity of the furnace must be 10% greater than that of the kettle into which the softened lead is tapped, as the dross and skimmings formed amount to about 10% of the weight of the lead charged. The kettle is spherical, and is suspended over a fire-place by a broad rim resting on a wall; it is usually of cast iron. Most kettles at present hold 30 tons of lead; some, however, have double that capacity. When zinc is placed on the lead (heated to above the melting-point of zinc), liquefied and brought into intimate contact with the lead by stirring, gold, copper, silver and lead will combine with the zinc in the order given. By beginning with a small amount of zinc, all the gold and copper and some silver and lead will be alloyed with the zinc to a so-called gold—or copper—crust, and the residual lead saturated with zinc. By removing from the surface of the lead this first crust and working it up separately (liquating, retorting and cupelling), doré silver is obtained. By the second addition of zinc most of the silver will be collected in a saturated zinc-silver-lead crust, which, when worked up, gives fine silver. A third addition becomes necessary to remove the rest of the silver, when the lead will assay only 0.1 oz. silver per ton. As this complete desilverization is only possible by the use of an excess of zinc, the unsaturated zinc-silver-lead alloy is put aside to form part of the second zincking of the next following charge. In skimming the crust from the surface of the lead some unalloyed lead is also drawn off, and has to be separated by an additional operation (liquation), as, running lower in silver than the crust, it would otherwise reduce its silver content and increase the amount of lead to be cupelled. A zincking takes 5-6 hours; 1.5-2.5% zinc is required for desilverizing. The liquated zinc-silver-lead crust contains 5-10% silver, 30-40% zinc and 65-50% lead. Before it can be cupelled it has to be freed from most of the zinc, which is accomplished by distilling in a retort made of a mixture similar to that of the plumbago crucible. The retort is pear-shaped, and holds 1000-1500 lb of charge, consisting of liquated crust mixed with 1-3% of charcoal. The condenser commonly used is an old retort. The distillation of 1000 lb charge lasts 5-6 hours, requires 500-600 lb coke or 30± gallons reduced oil, and yields about 10% metallic zinc and 1% blue powder—a mixture of finely-divided metallic zinc and zinc oxide. About 60% of the zinc used in desilverizing is recovered in a form to be used again. One man serves 2-4 retorts. The desilverized lead, which retains 0.6-0.7% zinc, has to be refined before it is suited for industrial use. The operation is carried on in a reverberatory furnace or in a kettle. In the reverberatory furnace, similar to the one used in softening, the lead is brought to a bright-red heat and air allowed to have free access. The zinc and some lead are oxidized; part of the zinc passes off with the fumes, part is dissolved by the litharge, forming a melted mixture which is skimmed off and reduced in a blast-furnace or a reverberatory smelting furnace. In the kettle covered

with a hood the zinc is oxidized by means of dry steam, and incidentally some lead by the air which cannot be completely excluded. A yellowish powdery mixture of zinc and lead oxides collects on the lead; it is skimmed off and sold as paint. From the reverberatory furnace or the kettle the refined lead is siphoned off into a storage (market) kettle after it has cooled somewhat, and from this it is siphoned off into moulds placed in a semi-circle on the floor. In the process the yield in metal, based upon the charge in the kettle, is lead 99%, silver 100+%, gold 98-100%. The plus-silver is due to the fact that in assaying the base bullion by cupellation, the silver lost by volatilization and cupel-absorption is neglected. In the United States the cost of desilverizing a ton base bullion is about $6.

*Properties of Lead.*—Pure lead is a feebly lustrous bluish-white metal, endowed with a characteristically high degree of softness and plasticity, and almost entirely devoid of elasticity. Its breaking strain is very small: a wire $\frac{1}{10}$th in. thick is ruptured by a charge of about 30 lb. The specific gravity is 11.352 for ingot, and from 11.354 to 11.365 for sheet lead (water of 4°C. = 1). The expansion of unit-length from 0°C. to to 100°C. is .002948 (Fizeau). The conductivity for heat (Wiedemann and Franz) or electricity is 8.5, that of silver being taken as 100. It melts at 327.7°C. (H. L. Callendar); at a bright-red heat it perceptibly vapourizes, and boils at a temperature between 1450° and 1600°. The specific heat is .0314 (Regnault). Lead exposed to ordinary air is rapidly tarnished, but the thin dark film formed is very slow in increasing. When kept fused in the presence of air lead readily takes up oxygen, with the formation at first of a dark-coloured scum, and then of monoxide PbO, the rate of oxidation increasing with the temperature.



Water when absolutely pure has no action on lead, but in the presence of air the lead is quickly attacked, with formation of the hydrate, $Pb(OH)_2$, which is appreciably soluble in water forming an alkaline liquid. When carbonic acid is present the dissolved oxide is soon precipitated as basic carbonate, so that the corrosion of the lead becomes continuous. Since all soluble lead compounds are strong cumulative poisons, danger is involved in using lead cisterns or pipes in the distribution of *pure* waters. The word “pure” is emphasized because experience shows that the presence in a water of even small proportions of calcium bicarbonate or sulphate prevents its action on lead. All impurities do not act in a similar way. Ammonium nitrate and nitrite, for instance, intensify the action of a water on lead. Even pure waters, however, such as that of Loch Katrine (which forms the Glasgow supply), act so slowly, at least on such lead pipes as have already been in use for some time, that there is no danger in using short lead service pipes even for them, if the taps are being constantly used. Lead cisterns must be unhesitatingly condemned.

The presence of carbonic acid in a water does not affect its action on lead. Aqueous non-oxidizing acids generally have little or no action on lead in the absence of air. Dilute sulphuric acid (say an acid of 20% $H_2SO_4$ or less) has no action on lead even when air is present, nor on boiling. Strong acid does act, the more so the greater its concentration and the higher its temperature. Pure lead is far more readily corroded than a metal contaminated with 1% or even less of antimony or copper. Boiling concentrated sulphuric acid converts lead into sulphate, with evolution of sulphur dioxide. Dilute nitric acid readily dissolves the metal, with formation of nitrate $Pb(NO_3)_2$.

*Lead Alloys.*—Lead, unites readily with almost all other metals; hence, and on account of its being used for the extraction of (for instance) silver, its alchemistic name of *saturnus*. Of the alloys the following may be named:—

*With Antimony.*—Lead contaminated with small proportions of antimony is more highly proof against sulphuric acid than the pure metal. An alloy of 83 parts of lead and 17 of antimony is used as type metal; other proportions are used, however, and other metals added besides antimony (*e.g.* tin, bismuth) to give the alloy certain properties.

*Arsenic* renders lead harder. An alloy made by addition of about $\frac{1}{56}$th of arsenic has been used for making shot.

*Bismuth and Antimony.*—An alloy consisting of 9 parts of lead, 2 of antimony and 2 of bismuth is used for stereotype plates.

*Bismuth and Tin.*—These triple alloys are noted for their low fusing points. An alloy of 5 of lead, 8 of bismuth and 3 of tin fuses at 94.4°C, *i.e.* below the boiling-point of water (Rose’s metal). An alloy of 15 parts of bismuth, 8 of lead, 4 of tin and 3 of cadmium (Wood’s alloy) melts below 70°C.

*Tin* unites with lead in any proportion with slight expansion, the alloy fusing at a lower temperature than either component. It is used largely for soldering.

“Pewter” (*q.v.*) may be said to be substantially an alloy of the same two metals, but small

quantities of copper, antimony and zinc are frequently added.

### *Compounds of Lead.*

Lead generally functions as a divalent element of distinctly metallic character, yielding a definite series of salts derived from the oxide PbO. At the same time, however, it forms a number of compounds in which it is most decidedly tetravalent; and thus it shows relations to carbon, silicon, germanium and tin.

*Oxides.*—Lead combines with oxygen to form five oxides, viz. $Pb_2O$, PbO, $PbO_2$, $Pb_2O_3$ and $Pb_3O_4$. The *suboxide*, $Pb_2O$, is the first product of the oxidation of lead, and is also obtained as a black powder by heating lead oxalate to 300° out of contact with air. It ignites when heated in air with the formation of the monoxide; dilute acids convert it into metallic lead and lead monoxide, the latter dissolving in the acid. The *monoxide*, PbO, occurs in nature as the mineral *lead ochre*. This oxide is produced by heating lead in contact with air and removing the film of oxide as formed. It is manufactured in two forms, known as "massicot" and "litharge." The former is produced at temperatures below, the latter at temperatures above the fusing-point of the oxide. The liquid litharge when allowed to cool solidifies into a hard stone-like mass, which, however, when left to itself, soon crumbles up into a heap of resplendent dark yellow scales known as "flake litharge." "Buff" or "levigated litharge" is prepared by grinding the larger pieces under water. Litharge is much used for the preparation of lead salts, for the manufacture of oil varnishes, of certain cements, and of lead plaster, and for other purposes. Massicot is the raw material for the manufacture of "red lead" or "minium."

Lead monoxide is dimorphous, occurring as cubical dodecahedra and as rhombic octahedra. Its specific gravity is about 9; it is sparingly soluble in water, but readily dissolves in acids and molten alkalis. A yellow and red modification have been described (*Zeit. anorg. Chem.*, 1906, 50, p. 265). The corresponding *hydrate*, $Pb(OH)_2$, is obtained as a white crystalline precipitate by adding ammonia to a solution of lead nitrate or acetate. It dissolves in an excess of alkali to form *plumbites* of the general formula $Pb(OM)_2$. It absorbs carbon dioxide from the air when moist. A hydrated oxide, $2PbO{\cdot}H_2O$, is obtained when a solution of the monoxide in potash is treated with carbon dioxide.

*Lead dioxide*, $PbO_2$, also known as "puce oxide," occurs in nature as the mineral plattnerite, and may be most conveniently prepared by heating mixed solutions of lead acetate and bleaching powder until the original precipitate blackens. The solution is filtered, the precipitate well washed, and, generally, is put up in the form of a paste in well-closed vessels. It is also obtained by passing chlorine into a suspension of lead oxide or carbonate, or of magnesia and lead sulphate, in water; or by treating the sesquioxide or red oxide with nitric acid. The formation of lead dioxide by the electrolysis of a lead solution, the anode being a lead plate coated with lead oxide or sulphate and the cathode a lead plate, is the fundamental principle of the storage cell (see ACCUMULATOR). Heating or exposure to sunlight reduces it to the red oxide; it fires when ground with sulphur, and oxidizes ammonia to nitric acid, with the simultaneous formation of ammonium nitrate. It oxidizes a manganese salt (free from chlorine) in the presence of nitric acid to a permanganate; this is a very delicate test for manganese. It forms crystallizable salts with potassium and calcium hydrates, and functions as a weak acid forming salts named plumbates. The Kassner process for the manufacture of oxygen depends upon the formation of calcium plumbate, $Ca_2PbO_4$, by heating a mixture of lime and litharge in a current of air, decomposing this substance into calcium carbonate and lead dioxide by heating in a current of carbon dioxide, and then decomposing these compounds with the evolution of carbon dioxide and oxygen by raising the temperature. *Plumbic acid*, $PbO(OH)_2$, is obtained as a bluish-black, lustrous body of electrolysing an alkaline solution of lead sodium tartrate.

*Tetravalent Lead.*—If a suspension of lead dichloride in hydrochloric acid be treated with chlorine gas, a solution of lead tetrachloride is obtained; by adding ammonium chloride ammonium plumbichloride, $(NH_4)_2PbCl_6$, is precipitated, which on treatment with strong sulphuric acid yields *lead tetrachloride*, $PbCl_4$, as a translucent, yellow, highly refractive liquid. It freezes at -15° to a yellowish crystalline mass; on heating it loses chlorine and forms lead dichloride. With water it forms a hydrate, and ultimately decomposes into lead dioxide and hydrochloric acid. It combines with alkaline chlorides—potassium, rubidium and caesium—to form crystalline *plumbichlorides*; it also forms a crystalline compound with quinoline. By dissolving red lead, $Pb_3O_4$, in glacial acetic acid and crystallizing the filtrate, colourless monoclinic prisms of lead tetracetate, $Pb(C_2H_3O_2)_4$, are obtained. This salt gives the corresponding chloride and fluoride with hydrochloric and hydrofluoric acids, and the phosphate, $Pb(HPO_4)_2$, with phosphoric acid.

These salts are like those of tin; and the resemblance to this metal is clearly enhanced by

the study of the alkyl compounds. Here compounds of divalent lead have not yet been obtained; by acting with zinc ethide on lead chloride, *lead tetraethide*, $Pb(C_2H_3)_4$, is obtained, with the separation of metallic lead.

*Lead sesquioxide*, $Pb_2O_3$, is obtained as a reddish-yellow amorphous powder by carefully adding sodium hypochlorite to a cold potash solution of lead oxide, or by adding very dilute ammonia to a solution of red lead in acetic acid. It is decomposed by acids into a mixture of lead monoxide and dioxide, and may thus be regarded as lead metaplumbate, $PbPbO_3$. *Red lead* or *triplumbic tetroxide*, $Pb_3O_4$, is a scarlet crystalline powder of specific gravity 8.6-9.1, obtained by roasting very finely divided pure massicot or lead carbonate; the brightness of the colour depends in a great measure on the roasting. Pliny mentions it under the name of *minium*, but it was confused with cinnabar and the red arsenic sulphide; Dioscorides mentions its preparation from white lead or lead carbonate. On heating it assumes a finer colour, but then turns violet and finally black; regaining, however, its original colour on cooling. On ignition, it loses oxygen and forms litharge. Commercial red lead is frequently contaminated with this oxide, which may, however, be removed by repeated digestion with lead acetate. Its common adulterants are iron oxides, powdered barytes and brick dust. Acids decompose it into lead dioxide and monoxide, and the latter may or may not dissolve to form a salt; red lead may, therefore, be regarded as *lead orthoplumbate*, $Pb_2PbO_4$. It is chiefly used as a pigment and in the manufacture of flint glass.

*Lead chloride*, $PbCl_2$, occurs in nature as the mineral cotunnite, which crystallizes in the rhombic system, and is found in the neighbourhood of volcanic craters. It is artificially obtained by adding hydrochloric acid to a solution of lead salt, as a white precipitate, little soluble in cold water, less so in dilute hydrochloric acid, more so in the strong acid, and readily soluble in hot water, from which on cooling, the excess of dissolved salt separates out in silky rhombic needles. It melts at 485° and solidifies on cooling to a translucent, horn-like mass; an early name for it was *plumbum corneum*, horn lead. A basic chloride, Pb(OH)Cl, was introduced in 1849 by Pattinson as a substitute for white lead. Powdered galena is dissolved in hot hydrochloric acid, the solution allowed to cool and the deposit of impure lead chloride washed with cold water to remove iron and copper. The residue is then dissolved in hot water, filtered, and the clear solution is mixed with very thin milk of lime so adjusted that it takes out one-half of the chlorine of the $PbCl_2$. The oxychloride comes down as an amorphous white precipitate. Another oxychloride, $PbCl_2{\cdot}7PbO$, known as “Cassel yellow,” was prepared by Vauquelin by fusing pure oxide, PbO, with one-tenth of its weight of sal ammoniac. “Turner’s yellow” or “patent yellow” is another artificially prepared oxychloride, used as a pigment. Mendipite and matlockite are mineral oxychlorides.



*Lead, fluoride*, $PbF_2$, is a white powder obtained by precipitating a lead salt with a soluble fluoride; it is sparingly soluble in water but readily dissolves in hydrochloric and nitric acids. A chloro-fluoride, PbClF, is obtained by adding sodium fluoride to a solution of lead chloride. Lead bromide, $PbBr_2$, a white solid, and lead iodide, $PbI_2$, a yellow solid, are prepared by precipitating a lead salt with a soluble bromide or iodide; they resemble the chloride in solubility.

*Lead carbonate*, $PbCO_3$, occurs in nature as the mineral cerussite (*q.v.*). It is produced by the addition of a solution of lead salt to an excess of ammonium carbonate, as an almost insoluble white precipitate. Of greater practical importance is a basic carbonate, substantially $2PbCO_3{\cdot}Pb(OH)_2$, largely used as a white pigment under the name of “white lead.” This pigment is of great antiquity; Theophrastus called it ψιμύθιον, and prepared it by acting on lead with vinegar, and Pliny, who called it *cerussa*, obtained it by dissolving lead in vinegar and evaporating to dryness. It thus appears that white lead and sugar of lead were undifferentiated. Geber gave the preparation in a correct form, and T. O. Bergman proved its composition. This pigment is manufactured by several methods. In the old Dutch method, pieces of sheet lead are suspended in stoneware pots so as to occupy the upper two-thirds of the vessels. A little vinegar is poured into each pot; they are then covered with plates of sheet lead, buried in horse-dung or spent tanner’s bark, and left to themselves for a considerable time. By the action of the acetic acid and atmospheric oxygen, the lead is converted superficially into a basic acetate, which is at once decomposed by the carbon dioxide, with formation of white lead and acetic acid, which latter then acts *de novo*. After a month or so the plates are converted to a more or less considerable depth into crusts of white lead. These are knocked off, ground up with water, freed from metal-particles by elutriation, and the paste of white lead is allowed to set and dry in small conical forms. The German method differs from the Dutch inasmuch as the lead is suspended in a large chamber heated by ordinary means, and there exposed to the simultaneous action of vapour of aqueous acetic acid and of carbon dioxide. Another process depends upon the formation of lead chloride by grinding together litharge with salt and water, and then treating the alkaline fluid with carbon dioxide until it is neutral. White lead is an earthy, amorphous powder. The inferior varieties of commercial “white lead” are produced by mixing the

genuine article with more or less of finely powdered heavy spar or occasionally zinc-white (ZnO). Venetian white, Hamburg white and Dutch white are mixtures of one part of white lead with one, two and three parts of barium sulphate respectively.

*Lead sulphide*, PbS, occurs in nature as the mineral galena (*q.v.*), and constitutes the most valuable ore of lead. It may be artificially prepared by leading sulphur vapour over lead, by fusing litharge with sulphur, or, as a black precipitate, by passing sulphuretted hydrogen into a solution of a lead salt. It dissolves in strong nitric acid with the formation of the nitrate and sulphate, and also in hot concentrated hydrochloric acid.

*Lead sulphate*, $PbSO_4$, occurs in nature as the mineral anglesite (*q.v.*), and may be prepared by the addition of sulphuric acid to solutions of lead salts, as a white precipitate almost insoluble in water (1 in 21,739), less soluble still in dilute sulphuric acid (1 in 36,504) and insoluble in alcohol. Ammonium sulphide blackens it, and it is coluble in solution of ammonium acetate, which distinguishes it from barium sulphate. Strong sulphuric acid dissolves it, forming an acid salt, $Pb(HSO_4)_2$, which is hydrolysed by adding water, the normal sulphate being precipitated; hence the milkiness exhibited by samples of oil of vitriol on dilution.

*Lead nitrate*, $Pb(NO_3)_2$, is obtained by dissolving the metal or oxide in aqueous nitric acid; it forms white crystals, difficultly soluble in cold water, readily in hot water and almost insoluble in strong nitric acid. It was mentioned by Libavius, who named it *calx plumb dulcis*. It is decomposed by heat into oxide, nitrogen peroxide and oxygen; and is used for the manufacture of fusees and other deflagrating compounds, and also for preparing mordants in the dyeing and calico-printing industries. Basic nitrates, *e.g.* $Pb(NO_3)OH$, $Pb_3O(OH)_2(NO_3)_2$, $Pb_3O_2(OH)NO_3$, &c., have been described.

*Lead Phosphates.*—The normal ortho-phosphate, $Pb_3(PO_4)_2$, is a white precipitate obtained by adding sodium phosphate to lead acetate; the acid phosphate, $PbHPO_4$, is produced by precipitating a boiling solution of lead nitrate with phosphoric acid; the pyrophosphate and meta-phosphate are similar white precipitates.

*Lead Borates.*—By fusing litharge with boron trioxide, glasses of a composition varying with the proportions of the mixture are obtained; some of these are used in the manufacture of glass. The borate, $Pb_2B_6O_{11}\cdot 4H_2O$, is obtained as a white precipitate by adding borax to a lead salt; this on heating with strong ammonia gives $PbB_2O_4\cdot H_2\cdot O$, which, in turn, when boiled with a solution of boric acid, gives $PbB_4O_7\cdot 4H_2O$.

*Lead silicates* are obtained as glasses by fusing litharge with silica; they play a considerable part in the manufacture of the lead glasses (see Glass).

*Lead chromate*, $PbCrO_4$, is prepared industrially as a yellow pigment, chrome yellow, by precipitating sugar of lead solution with potassium bichromate. The beautiful yellow precipitate is little soluble in dilute nitric acid, but soluble in caustic potash. The vermilion-like pigment which occurs in commerce as “chrome-red” is a basic chromate, $Pb_2CrO_5$, prepared by treating recently precipitated normal chromate with a properly adjusted proportion of caustic soda, or by boiling it with normal (yellow) potassium chromate.

*Lead acetate*, $Pb(C_2H_3O_2)_2\cdot 3H_2O$ (called “sugar” of lead, on account of its sweetish taste), is manufactured by dissolving massicot in aqueous acetic acid. It forms colourless transparent crystals, soluble in one and a half parts of cold water and in eight parts of alcohol, which on exposure to ordinary air become opaque through absorption of carbonic acid, which forms a crust of basic carbonate. An aqueous solution readily dissolves lead oxide, with formation of a strongly alkaline solution containing basic acetates (*Acetum Plumbi* or *Saturni*). When carbon dioxide is passed into this solution the whole of the added oxide, and even part of the oxide of the normal salt, is precipitated as a basic carbonate chemically similar, but not quite equivalent as a pigment, to white lead.

*Analysis.*—When mixed with sodium carbonate and heated on charcoal in the reducing flame lead salts yield malleable globules of metal and a yellow oxide-ring. Solutions of lead salts (colourless in the absence of coloured acids) are characterized by their behaviour to hydrochloric acid, sulphuric acid and potassium chromate. But the most delicate precipitant for lead is sulphuretted hydrogen, which produces a black precipitate of lead sulphide, insoluble in cold dilute nitric acid, less so in cold hydrochloric, and easily decomposed by hot hydrochloric acid with formation of the characteristic chloride. The atomic weight, determined by G. P. Baxter and J. H. Wilson (*J. Amer. Chem. Soc.*, 1908, 30, p. 187) by analysing the chloride, is 270.190 (O = 16).

*Pharmacology and Therapeutics.*

The metal itself is not used in medicine. The chief pharmacopoeial salts are: (1) *Plumbi oxidum* (lead oxide), litharge. It is not used internally, but from it is made *Emplastrum Plumbi* (diachylon plaster), which is an oleate of lead and is contained in emplastrum hydrargeri, emplastrum plumbi iodidi, emplastrum resinae, emplastrum saponis. (2) *Plumbi Acetas* (sugar of lead), dose 1 to 5 grains. From this salt are made the following preparations: (*a*) *Pilula Plumbi cum Opio*, the strength of the opium in it being 1 in 8, dose 2 to 4 grains; (*b*) *Suppositoria Plumbi composita*, containing lead acetate, opium and oil of theobroma, there being one grain of opium in each suppository; (*c*) *Unguentum Plumbi Acetatis*; (*d*) *Liquor Plumbi Subacetatis Fortior*, Goulard's extract, strength 24% of the subacetate; this again has a sub-preparation, the *Liquor Plumbi Subacetatis Dilutis*, called Goulard's water or Goulard's lotion, containing 1 part in 80 of the strong extract; (*e*) *Glycerinum Plumbi Subacetatis*, from which is made the *Unguentum Glycerini Plumbi Subacetatis*. (3) *Plumbi Carbonas*, white lead, a mixture of the carbonate and the hydrate, a heavy white powder insoluble in water; it is not used internally, but from it is made *Unguentum Plumbi Carbonatis*, strength 1 in 10 parts of paraffin ointment. (4) *Plumbi Iodidium*, a heavy bright yellow powder not used internally. From it are made (*a*) *Emplastrum Plumbi Iodidi*, and (*b*) *Unguentum Plumbi Iodidi*. The strength of each is 1 in 10.

Applied externally lead salts have practically no action upon the unbroken skin, but applied to sores, ulcers or any exposed mucous membranes they coagulate the albumen in the tissues themselves and contract the small vessels. They are very astringent, haemostatic and sedative; the strong solution of the subacetate is powerfully caustic and is rarely used undiluted. Lead salts are applied as lotions in conditions where a sedative astringent effect is desired, as in weeping eczema; in many varieties of chronic ulceration; and as an injection for various inflammatory discharges from the vagina, ear and urethra, the Liquor Plumbi Subacetatis Dilutum being the one employed. The sedative effect of lead lotion in pruritus is well known. Internally lead has an astringent action on the mucous membranes, causing a sensation of dryness; the dilute solution of the subacetate forms an effective gargle in tonsillitis. The chief use of the preparations of lead, however, is as an astringent in acute diarrhoea, particularly if ulceration be present, when it is usefully given in combination with opium in the form of the Pilula Plumbi cum Opio. It is useful in haemorrhage from a gastric ulcer or in haemorrhage from the intestine. Lead salts usually produce constipation, and lead is an active ecbolic. Lead is said to enter the blood as an albuminate in which form it is deposited in the tissues. As a rule the soluble salts if taken in sufficient quantities produce acute poisoning, and the insoluble salts chronic plumbism. The symptoms of acute poisoning are pain and diarrhoea, owing to the setting up of an active gastro-enteritis, the foeces being black (due to the formation of a sulphide of lead), thirst, cramps in the legs and muscular twitchings, with torpor, collapse, convulsions and coma. The treatment is the prompt use of emetics, or the stomach should be washed out, and large doses of sodium or magnesium sulphate given in order to form an insoluble sulphate. Stimulants, warmth and opium may be required. For an account of chronic plumbism see LEAD POISONING.



AUTHORITIES.—For the history of lead see W. H. Pulsifer, *Notes for a History of Lead* (1888); B. Neumann, *Die Metalle* (1904); A. Rossing, *Geschichte der Metalle* (1901). For the chemistry see H. Roscoe and C. Schorlemmer, *Treatise on Inorganic Chemistry*, vol. ii. (1897); H. Moissan, *Traité de chimie minerale*; O. Dammer, *Handbuch der anorganischen Chemie*. For the metallurgy see J. Percy, *The Metallurgy of Lead* (London, 1870); H. F. Collins, *The Metallurgy of Lead and Silver* (London, 1899), part i. "Lead"; H. O. Hofmann, *The Metallurgy of Lead* (6th ed., New York, 1901); W. R. Ingalls, *Lead Smelting and Refining* (1906); A. G. Betts, *Lead Refining by Electrolysis* (1908); M. Eissler, *The Metallurgy of Argentiferous Silver*. *The Mineral Industry*, begun in 1892, annually records the progress made in lead smelting.

**LEADER, BENJAMIN WILLIAMS** (1831- ), English painter, the son of E. Leader Williams, an engineer, received his art education first at the Worcester School of Design and later in the schools of the Royal Academy. He began to exhibit at the Academy in 1854, was elected A.R.A. in 1883 and R.A. in 1898, and became exceedingly popular as a painter of landscape. His subjects are attractive and skilfully composed. He was awarded a

gold medal at the Paris Exhibition in 1889, and was made a knight of the Legion of Honour. One of his pictures, “The Valley of the Llugwy,” is in the National Gallery of British Art.

See *The Life and Work of B. W. Leader, R.A.*, by Lewis Lusk, *Art Journal* Office (1901).

**LEADHILLITE,** a rare mineral consisting of basic lead sulphato-carbonate, $Pb_4SO_4(CO_3)_2(OH)_2$. Crystals have usually the form of six-sided plates (fig. 1) or sometimes of acute rhombohedra (fig. 2); they have a perfect basal cleavage (parallel to P in fig. 1) on which the lustre is strongly pearly; they are usually white and translucent. The hardness is 2.5 and the sp. gr. 6.26-6.44. The crystallographic and optical characters point to the existence of three distinct kinds of leadhillite, which are, however, identical in external appearance and may even occur intergrown together in the same crystal: (*a*) monoclinic with an optic axial angle of 20°; (*b*) rhombohedral (fig. 2) and optically uniaxial; (*c*) orthorhombic (fig. 1) with an optic axial angle of 72¾°. The first of these is the more common kind, and the second has long been known under the name susannite. The fact that the published analyses of leadhillite vary somewhat from the formula given above suggests that these three kinds may also be chemically distinct.

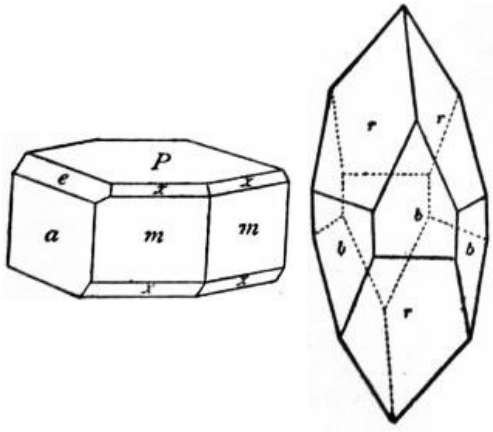



Fig. 1. Fig. 2.

Leadhillite is a mineral of secondary origin, occurring with cerussite, anglesite, &c., in the oxidized portions of lead-bearing lodes; it has also been found in weathered lead slags left by the Romans. It has been found most abundantly in the Susanna mine at Leadhills in Scotland (hence the names leadhillite and susannite). Good crystals have also been found at Red Gill in Cumberland and at Granby in Missouri. Crystals from Sardinia have been called maxite.

(L. J. S.)

**LEADHILLS,** a village of Lanarkshire, Scotland, 5¾ m. W.S.W. of Elvanfoot station on the Caledonian Railway Company’s main line from Glasgow to the south. Pop. (1901) 835. It is the highest village in Scotland, lying 1301 ft. above sea-level, near the source of Glengonner Water, an affluent of the Clyde. It is served by a light railway. Lead and silver have been mined here and at Wanlockhead, 1½ m. S.W., for many centuries—according to some authorities even in Roman days. Gold was discovered in the reign of James IV., but though it is said then to have provided employment for 300 persons, its mining has long ceased to be profitable. The village is neat and well built, and contains a masonic hall and library, the latter founded by the miners about the middle of the 18th century. Allan Ramsay, the poet, and William Symington (1763-1831), one of the earliest adaptors of the steam engine to the purposes of navigation, were born at Leadhills.

LEAD POISONING, or Plumbism, a "disease of occupations," which is itself the cause of organic disease, particularly of the nervous and urinary systems. The workpeople affected are principally those engaged in potteries where lead-glaze is used; but other industries in which health is similarly affected are file-making, house-painting and glazing, glass-making, copper-working, coach-making, plumbing and gasfitting, printing, cutlery, and generally those occupations in which lead is concerned.

The symptoms of chronic lead poisoning vary within very wide limits, from colic and constipation up to total blindness, paralysis, convulsions and death. They are thus described by Dr J. T. Arlidge (*Diseases of Occupations*):—

> The poison finds its way gradually into the whole mass of the circulating blood, and exerts its effects mainly on the nervous system, paralysing nerve-force and with it muscular power. Its victims become of a sallow-waxy hue; the functions of the stomach and bowels are deranged, appetite fails and painful colic with constipation supervenes. The loss of power is generally shown first in the fingers, hands and wrists, and the condition known as "wrist-drop" soon follows, rendering the victim useless for work. The palsy will extend to the shoulders, and after no long time to the legs also. Other organs frequently involved are the kidneys, the tissue of which becomes permanently damaged; whilst the sight is weakened or even lost.

Dr M'Aldowie, senior physician to the North Staffordshire Infirmary, has stated that "in the pottery trade lead is very slow in producing serious effects compared with certain other industries." In his experience the average period of working in lead before serious lesions manifest themselves is 18 years for females and 22½ years for males. But some individuals fall victims to the worst forms of plumbism after a few months' or even weeks' exposure to the danger. Young persons are more readily affected than those of mature age, and women more than men. In addition, there seems to be an element of personal susceptibility, the nature of which is not understood. Some persons "work in the lead" for twenty, forty or fifty years without the slightest ill effects; others have attacks whenever they are brought into contact with it. Possibly the difference is due to the general state of health; robust persons resist the poison successfully, those with impoverished blood and feeble constitution are mastered by it. Lead enters the body chiefly through the nose and mouth, being inspired in the form of dust or swallowed with food eaten with unwashed hands. It is very apt to get under the nails, and is possibly absorbed in this way through the skin. Personal care and cleanliness are therefore of the greatest importance. A factory surgeon of great experience in the English Potteries has stated that seventeen out of twenty cases of lead-poisoning in the china and earthenware industry are due to carelessness (*The Times*, 8th October 1898).



The Home Office in England has from time to time made special rules for workshops and workpeople, with the object of minimizing or preventing the occurrence of lead-poisoning; and in 1895 notification of cases was made compulsory. The health of workpeople in the Potteries was the subject of a special inquiry by a scientific committee in 1893. The committee stated that "the general truth that the potteries occupation is one fraught with injury to health and life is beyond dispute," and that "the ill effects of the trade are referable to two chief causes—namely, dust and the poison of lead." Of these the inhalation of clay and flint dust was the more important. It led to bronchitis, pulmonary tuberculosis and pneumonia, which were the most prevalent disorders among potters, and responsible for 70% of the mortality. That from lead the committee did not attempt to estimate, but they found that plumbism was less prevalent than in past times, and expressed the opinion "that a large part of the mortality from lead poisoning is avoidable; although it must always be borne in mind that no arrangements or rules, with regard to the work itself, can entirely obviate the effects of the poison to which workers are exposed, because so much depends upon the individual and the observance of personal care and cleanliness." They recommended the adoption of certain special rules in the workshops, with the objects of protecting young persons from the lead, of minimizing the evils of dust, and of promoting cleanliness, particularly in regard to meals. Some of these recommendations were adopted and applied with good results. With regard to the suggestion that "only leadless glazes should be used on earthenware," they did not "see any immediate prospect of such glazes

becoming universally applicable to pottery manufacture," and therefore turned their attention to the question of "fritting" the lead.

> It may be explained that lead is used in china and earthenware to give the external glaze which renders the naturally porous ware watertight. Both "white" and "red" lead are used. The lead is added to other ingredients, which have been "fritted" or fused together and then ground very fine in water, making a thick creamy liquid into which the articles are dipped. After dipping the glaze dries quickly, and on being "fired" in the kiln it becomes fused by the heat into the familiar glassy surface. In the manufacture of ware with enamelled colours, glaze is mixed with the pigment to form a flux, and such colours are used either moist or in the form of a dry powder. "Fritting" the lead means mixing it with the other ingredients of the glaze beforehand and fusing them all together under great heat into a kind of rough glass, which is then ground to make the glaze. Treated in this way the lead combines with the other ingredients and becomes less soluble, and therefore less dangerous, than when added afterwards in the raw state. The committee (1893) thought it "reasonable to suppose that the fritting of lead might ultimately be found universally practicable," but declared that though fritting "no doubt diminishes the danger of lead-poisoning," they "could not regard all fritts as equally innocuous."

In the annual report of the chief inspector of factories for 1897, it was stated that there had been "material improvement in dust conditions" in the potting industry, but "of lead-poisoning unfortunately the same could not be said, the number of grave cases reported, and particularly cases of blindness, having ominously increased of late." This appears to have been largely due to the erroneous inclusion among potting processes of "litho-transfer making," a colour industry in which girls are employed. New special rules were imposed in 1899 prohibiting the employment of persons under fifteen in the dangerous processes, ordering a monthly examination of all women and young persons working in lead by the certifying surgeon, with power to suspend those showing symptoms of poisoning, and providing for the more effectual removal of dust and the better enforcement of cleanliness. At the same time a scientific inquiry was ordered into the practicability of dispensing with lead in glazes or of substituting fritted compounds for the raw carbonate. The scientific experts reported in 1899, recommending that the use of raw lead should be absolutely prohibited, and expressing the opinion that the greater amount of earthenware could be successfully glazed without any lead. These views were in advance of the opinions held by practical potters, and met with a good deal of opposition. By certain manufacturers considerable progress had been made in diminishing the use of raw lead and towards the discovery of satisfactory leadless glazes; but it is a long step from individual experiments to the wholesale compulsory revolution of the processes of manufacture in so large and varied an industry, and in the face of foreign competitors hampered by no such regulations. The materials used by each manufacturer have been arrived at by a long process of experience, and they are such as to suit the particular goods he supplies for his particular market. It is therefore difficult to apply a uniform rule without jeopardizing the prosperity of the industry, which supports a population of 250,000 in the Potteries alone. However, the bulk of the manufacturers agreed to give up the use of raw lead, and to fritt all their glazes in future, time being allowed to effect the change of process; but they declined to be bound to any particular composition of glaze for the reasons indicated.

In 1901 the Home Office brought forward a new set of special rules. Most of these were framed to strengthen the provisions for securing cleanliness, removing dust, &c., and were accepted with a few modifications. But the question of making even more stringent regulations, even to the extent of making the use of lead-glaze illegal altogether, was still agitated; and in 1906 the Home Office again appointed an expert committee to reinvestigate the subject. They reported in 1910, and made various recommendations in detail for strengthening the existing regulations; but while encouraging the use of leadless glaze in certain sorts of common ceramic ware, they pointed out that, without the use of lead, certain other sorts could either not be made at all or only at a cost or sacrifice of quality which would entail the loss of important markets.

> In 1908 Dr Collis made an inquiry into the increase of plumbism in connexion with the smelting of metals, and he considered the increase in the cases of poisoning reported to be due to the third schedule of the Workmen's Compensation Act, (1) by causing the prevalence of pre-existing plumbism to come to light, (2) by the tendency this fostered to replace men suspected of lead impregnation by new hands amongst whom the incidence is necessarily greater.

LEADVILLE, a city and the county seat of Lake county, Colorado, U.S.A., one of the highest (mean elevation *c.* 10,150 ft.) and most celebrated mining "camps" of the world. Pop. (1900) 12,455, of whom 3802 were foreign-born; (1910 census) 7508. It is served by the Denver & Rio Grande, the Colorado & Southern and the Colorado Midland railways. It lies amid towering mountains on a terrace of the western flank of the Mosquito Range at the head of the valley of the Arkansas river, where the river cuts the valley between the Mosquito and the Sawatch (Saguache) ranges. Among the peaks in the immediate environs are Mt. Massive (14,424 ft., the highest in the state) and Elbert Peak (14,421 ft.). There is a United States fish hatchery at the foot of Mt. Massive. In the spring of 1860 placer gold was discovered in California Gulch, and by July 1860 Oro City had probably 10,000 inhabitants. In five years the total yield was more than $5,000,000; then it diminished, and Oro City shrank to a few hundred inhabitants. This settlement was within the present limits of Leadville. In 1876 the output of the mines was about $20,000. During sixteen years "heavy sands" and great boulders that obstructed the placer fields had been moved thoughtlessly to one side. These boulders were from enormous lead carbonate deposits extremely rich in silver. The discovery of these deposits was made on the hills at the edge of Leadville. The first building was erected in June 1877; in December there were several hundred miners, in January the town was organized and named; at the end of 1879 there were, it is said, 35,000 inhabitants. Leadville was already a chartered city, with the usual organization and all public facilities. In 1880 it was reached by the Denver & Rio Grande railway. In early years Leadville was one of the most turbulent, picturesque and in all ways extraordinary, of the mining camps of the West. The value of the output from 1879 to 1889 totalled $147,834,186, including one-fifth of the silver production and a third of the lead consumption of the country. The decline in the price of silver, culminating with the closing of the India mints and the repeal of the Sherman Law in 1893, threatened Leadville's future. But the source of the gold of the old placers was found in 1892. From that year to 1899 the gold product rose from $262,692 to $2,183,332. From 1879 to 1900 the camp yielded $250,000,000 (as compared with $48,000,000 of gold and silver in five years from the Comstock, Nevada, lode; and $60,000,000 and 225,000 tons of lead, in fourteen years, from the Eureka, Nevada, mines). Before 1898 the production of zinc was unimportant, but in 1906 it was more valuable than that of silver and gold combined. This increased output is a result of the establishment of concentrating mills, in which the zinc content is raised from 18 or 20% in the raw ores to 25 or 45% in the concentrates. In 1904, per ton of Lake county ore, zinc was valued at $6.93, silver at $4.16, lead at $3.85, gold at $1.77 and copper at $.66. The copper mined at Leadville amounted to about one-third the total mined in the state in 1906. Iron and manganese have been produced here, and in 1906 Leadville was the only place in the United States known to have produced bismuth. There were two famous labour strikes in the "diggings" in 1879 and 1896. The latter attracted national attention; it lasted from the 19th of June 1896 to the 9th of March 1897, when the miners, being practically starved out, declared the strike off. There had been a riot on the 21st of September 1896 and militia guarded the mines for months afterwards. In January 1897 the mines on Carbonate Hill were flooded after the removal of their pumps. This strike closed many mines, which were not opened for several years. Leadville stocks are never on the exchange, and "flotation" and "promotion" have been almost unknown.

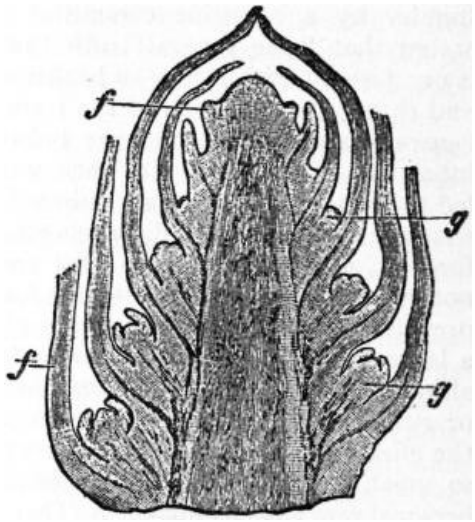


> The ores of the Leadville District occur in a blue limestone formation overlaid by porphyry, and are in the form of heavy sulphides, containing copper, gold, silver, lead and zinc; oxides containing iron, manganese and small amounts of silver and lead; and siliceous ores, containing much silver and a little lead and gold. The best grade of ores usually consists of a mixture of sulphides, with some native gold. Nowhere have more wonderful advances in mining been apparent—in the size and character of furnaces and pumps; the development of local smelter supplies; the fall in the cost of coal, of explosives and other mine supplies; the development of railways and diminution of freight expenses; and the general improvement of economic and scientific methods—than at Leadville since 1880. The increase of output more than doubled from 1890 to 1900, and many ores once far too low in grade for working now yield sure profits. The Leadville smelters in 1900 had a capacity of 35,000 tons monthly; about as much more local ore being treated at Denver, Pueblo and other places.

See S. F. Emmons, *Geology and Mining Industry of Leadville, Colorado*, monograph United States Geological Survey, vol. 12 (1886), and with J. D. Irving, *The Downtown District of Leadville, Colorado*, Bulletin 320, United States Geological Survey (1907), particularly for the discussion of the origin of the ores of the region.

LEAF (O. Eng. *léaf*, cf. Dutch *loof*, Ger. *Laub*, Swed. *löf*, &c.; possibly to be referred to the root seen in Gr. λέπειν, to peel, strip), the name given in popular language to all the green expanded organs borne upon an axis, and so applied to similar objects, such as a thin sheet of metal, a hinged flap of a table, the page of a book, &c. Investigation has shown that many other parts of a plant which externally appear very different from ordinary leaves are, in their essential particulars, very similar to them, and are in fact their morphological equivalents. Such are the scales of a bulb, and the various parts of the flower, and assuming that the structure ordinarily termed a leaf is the typical form, these other structures were designated changed or metamorphosed leaves, a somewhat misleading interpretation. All structures morphologically equivalent with the leaf are now included under the general term *phyllome* (leaf-structure).

Leaves are produced as lateral outgrowths of the stem in definite succession below the apex. This character, common to all leaves, distinguishes them from other organs. In the higher plants we can easily recognize the distinction between stem and leaf. Amongst the lower plants, however, it is found that a demarcation into stem and leaf is impossible, but that there is a structure which partakes of the characters of both—such is a *thallus*. The leaves always arise from the outer portion of the primary meristem of the plant, and the tissues of the leaf are continuous with those of the stem. Every leaf originates as a simple cellular papilla (fig. 1), which consists of a development from the cortical layers covered by epidermis; and as growth proceeds, the fibro-vascular bundles of the stem are continued outwards, and finally expand and terminate in the leaf. The increase in length of the leaf by growth at the apex is usually of a limited nature. In some ferns, however, there seems to be a provision for indefinite terminal growth, while in others this growth is periodically interrupted. It not unfrequently happens, especially amongst Monocotyledons, that after growth at the apex has ceased, it is continued at the base of the leaf, and in this way the length may be much increased. Amongst Dicotyledons this is very rare. In all cases the dimensions of the leaf are enlarged by interstitial growth of its parts.




From Strasburger's Lehrbuch der Botanik by permission of Gustav Fischer.

FIG. 1.—Apex of a shoot showing origin of leaves: *f*, leaf rudiment; *g*, rudiment of an axillary bud.

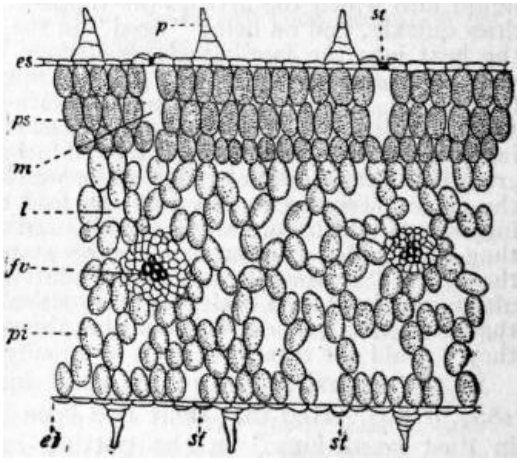


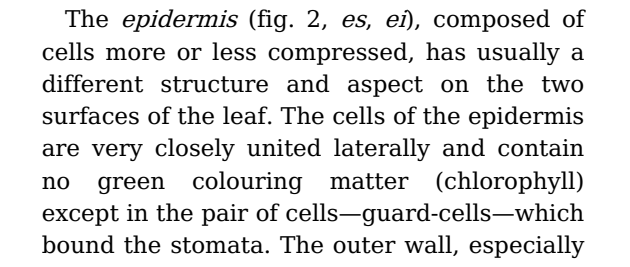

FIG. 2.—Section of a Melon leaf, perpendicular to the surface.

*es*, Upper epidermis.
*ei*, Lower epidermis.
*p*, Hairs.

***Structure of leaves.***

The simplest leaf is found in some mosses, where it consists of a single layer of cells. The typical foliage leaf consists of several layers, and amongst vascular plants is distinguishable into an outer layer (*epidermis*) and a central tissue (*parenchyma*) with fibro-vascular bundles

distributed through it.



*st*, Stomata.
*ps*, Upper (palisade) layers of parenchymatous cells.
*pi*, Lower (spongy) layers of parenchymatous cells.
*m*, Air-spaces connected with stomata.
*l*, Air-spaces between the loose cells in the spongy parenchyma.
*fv*, Bundles of fibro-vascular tissue.

The *epidermis* (fig. 2, *es*, *ei*), composed of cells more or less compressed, has usually a different structure and aspect on the two surfaces of the leaf. The cells of the epidermis are very closely united laterally and contain no green colouring matter (chlorophyll) except in the pair of cells—guard-cells—which bound the stomata. The outer wall, especially of the upper epidermis, has a tough outer layer or cuticle which renders it impervious to water. The epidermis is continuous except where stomata or spaces bounded by specialized cells communicate with intercellular spaces in the interior of the leaf. It is chiefly on the epidermis of the lower surface (fig. 2, *ei*) that stomata, *st*, are produced, and it is there also that hairs, *p*, usually occur. The lower epidermis is often of a dull or pale-green colour, soft and easily detached. The upper epidermis is frequently smooth and shining, and sometimes becomes very hard and dense. Many tropical plants present on the upper surface of their leaves several layers of compressed cells beneath the epidermis which serve for storage of water and are known as aqueous tissue. In leaves which float upon the surface of the water, as those of the water-lily, the upper epidermis alone possesses stomata.

The *parenchyma* of the leaf is the cellular tissue enclosed within the epidermis and surrounding the vessels (fig. 2, *ps*, *pi*). It is known as *mesophyll*, and is formed of two distinct series of cells, each containing the green chlorophyll-granules, but differing in form and arrangement. Below the epidermis of the upper side of the leaf there are one or two layers of cells, elongated at right angles to the leaf surface (fig. 2, *ps*), and applied so closely to each other as to leave only small intercellular spaces, except where stomata happen to be present (fig. 2, *m*); they form the palisade tissue. On the other side of the leaf the cells are irregular, often branched, and are arranged more or less horizontally (fig. 2, *pi*), leaving air-spaces between them, *l*, which communicate with stomata; on this account the tissue has received the name of spongy. In leaves having a very firm texture, as those of Coniferae and Cycadaceae, the cells of the parenchyma immediately beneath the epidermis are very much thickened and elongated in a direction parallel to the surface of the leaf, so as to be fibre-like. These constitute a hypodermal layer, beneath which the chlorophyll cells of the parenchyma are densely packed together, and are elongated in a direction vertical to the surface of the leaf, forming the palisade tissue. The form and arrangement of the cells, however, depend much on the nature of the plant, and its exposure to light and air. Sometimes the arrangement of the cells on both sides of the leaf is similar, as occurs in leaves which have their edges presented to the sky. In very succulent plants the cells form a compact mass, and those in the centre are often colourless. In some cases the cellular tissue is deficient at certain points, giving rise to distinct holes in the leaf, as in *Monstera Adansonii*. The fibro-vascular system in the leaf constitutes the *venation*. The fibro-vascular bundles from the stem bend out into the leaf, and are there arranged in a definite manner. In *skeleton leaves*, or leaves in which the parenchyma is removed, this arrangement is well seen. In some leaves, as in the barberry, the veins are hardened, producing spines without any parenchyma. The hardening of the extremities of the fibro-vascular tissue is the cause of the spiny margin of many leaves, such as the holly, of the sharp-pointed leaves of madder, and of mucronate leaves, or those having a blunt end with a hard projection in the centre.



The form and arrangement of the parts of a typical foliage leaf are intimately associated with the part played by the leaf in the life of the plant. The flat surface is spread to allow the maximum amount of sunlight to fall upon it, as it is by the absorption of energy from the sun’s rays by means of the chlorophyll contained in the cells of the leaf that the building up of plant food is rendered possible; this process is known as photo-synthesis; the first stage is the combination of carbon dioxide, absorbed from the air taken in through the stomata into the living cells of the leaf, with water which is brought into the leaf by the wood-vessels. The wood-vessels form part of the fibro-vascular bundles or veins of the leaf and are continuous throughout the leaf-stalk and stem with the root by which water is absorbed from the soil. The palisade layers of the mesophyll contain the larger number of chlorophyll grains (or corpuscles) while the absorption of carbon dioxide is carried on chiefly through the lower epidermis which is generally much richer in stomata. The water taken up by the root from the soil contains nitrogenous and mineral salts which combine with the first product of photo-synthesis—a carbohydrate—to form more complicated nitrogen-containing food substances of a proteid nature; these are then distributed by other elements of the vascular bundles (the *phloem*) through the leaf to the stem and so throughout the plant to wherever growth or development is going on. A large proportion of the water which ascends to the leaf acts merely as a carrier for the other raw food materials and is got rid of from the leaf in the form of water vapour through the stomata—this process is known as *transpiration*.

Hence the extended surface of the leaf exposing a large area to light and air is eminently adapted for the carrying out of the process of photo-synthesis and transpiration. The arrangement of the leaves on the stem and branches (see *Phyllotaxy*, below) is such as to prevent the upper leaves shading the lower, and the shape of the leaf serves towards the same end—the disposition of leaves on a branch or stem is often seen to form a "mosaic," each leaf fitting into the space between neighbouring leaves and the branch on which they are borne without overlapping.

Submerged leaves, or leaves which are developed under water, differ in structure from aerial leaves. They have usually no fibro-vascular system, but consist of a congeries of cells, which sometimes become elongated and compressed so as to resemble veins. They have a layer of compact cells on their surface, but no true epidermis, and no stomata. Their internal structure consists of cells, disposed irregularly, and sometimes leaving spaces which are filled with air for the purpose of floating the leaf. When exposed to the air these leaves easily part with their moisture, and become shrivelled and dry. In some cases there is only a network of filament-like cells, the spaces between which are not filled with parenchyma, giving a skeleton appearance to the leaf, as in *Ouvirandra fenestralis* (Lattice plant).

A leaf, whether aerial or submerged, generally consists of a flat expanded portion, called the *blade*, or *lamina*, of a narrower portion called the *petiole* or *stalk*, and sometimes of a portion at the base of the petiole, which forms a *sheath* or *vagina* (fig. 5, *s*), or is developed in the form of outgrowths, called *stipules* (fig. 24, *s*). All these portions are not always present. The sheathing or stipulary portion is frequently wanting. When a leaf has a distinct stalk it is *petiolate*; when it has none, it is *sessile*, and if in this case it embraces the stem it is said to be *amplexicaul*. The part of the leaf next the petiole or the axis is the *base*, while the opposite extremity is the *apex*. The leaf is usually flattened and expanded horizontally, *i.e.* at right angles to the longitudinal axis of the shoot, so that the upper face is directed towards the heavens, and the lower towards the earth. In some cases leaves, as in Iris, or leaf-like petioles, as in Australian acacias and eucalypti, have their plane of expansion parallel to the axis of the shoot, there is then no distinction into an upper and a lower face, but the two sides are developed alike; or the leaf may have a cylindrical or polyhedral form, as in mesembryanthemum. The upper angle formed between the leaf and the stem is called its *axil*; it is there that leaf-buds are normally developed. The leaf is sometimes articulated with the stem, and when it falls off a *scar* remains; at other times it is continuous with it, and then decays, while still attached to the axis. In their early state all leaves are continuous with the stem, and it is only in their after growth that articulations are formed. When leaves fall off annually they are called *deciduous*; when they remain for two or more years they are *persistent*, and the plant is *evergreen*. The laminar portion of a leaf is occasionally articulated with the petiole, as in the orange, and a joint at times exists between the vaginal or stipulary portion and the petiole.

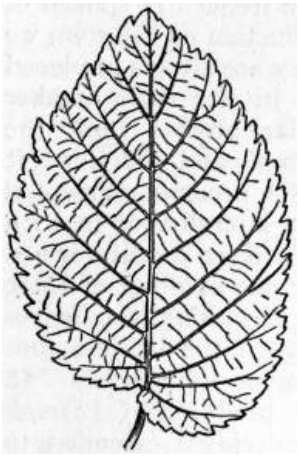


FIG. 3.—Leaf of Elm (*Ulmus*). Reticulated venation; primary veins going to the margin, which is serrated. Leaf unequal at the base.

FIG. 4.—Multicostate leaf of Castor-oil plant (*Ricinus communis*). It is palmately-cleft, and exhibits seven lobes at the margin. The petiole is inserted a little above the base, and hence the leaf is called peltate or shield-like.

The arrangement of the fibro-vascular system in the lamina constitutes the *venation* or *nervation*. In an ordinary leaf, as that of the elm, there is observed a large central vein running from the base to the apex of the leaf, this is the *midrib* (fig. 3); it gives off veins laterally (*primary veins*). A leaf with only a single midrib is said to be

***Venation.*** *unicostate* and the venation is described as pinnate or feather-veined. In some cases, as sycamore or castor oil (fig. 4), in place of there being only a single midrib there are several large veins (*ribs*) of nearly equal size, which diverge from the point where the blade joins the petiole or stem, giving off lateral veins. The leaf in this case is *multicostate* and the venation palmate. The primary veins give off secondary veins, and these in their turn give off tertiary veins, and so on until a complete network of vessels is produced, and those veins usually project on the under surface of the leaf. To a distribution of veins such as this the name of *reticulated* or *netted* venation has been applied. In the leaves of some plants there exists a midrib with large veins running nearly parallel to it from the base to the apex of the lamina, as in grasses (fig. 5); or with veins diverging from the base of the lamina in more or less parallel lines, as in fan palms (fig. 6), or with veins coming off from it throughout its whole course, and running parallel to each other in a straight or curved direction towards the margin of the leaf, as in plantain and banana. In these cases the veins are often united by cross veinlets, which do not, however, form an angular network. Such leaves are said to be *parallel-veined*. The leaves of Monocotyledons have generally this kind of venation, while reticulated venation most usually occurs amongst Dicotyledons. Some plants, which in most points of their structure are monocotyledonous, yet have reticulated venation; as in *Smilax* and *Dioscorea*. In vascular acotyledonous plants there is frequently a tendency to fork exhibited by the fibro-vascular bundles in the leaf; and when this is the case we have *fork-veined* leaves. This is well seen in many ferns. The distribution of the system of vessels in the leaf is usually easily traced, but in the case of succulent plants, as *Hoya*, agave, stonecrop and mesembryanthemum, the veins are obscure. The function of the veins which consist of vessels and fibres is to form a rigid framework for the leaf and to conduct liquids.



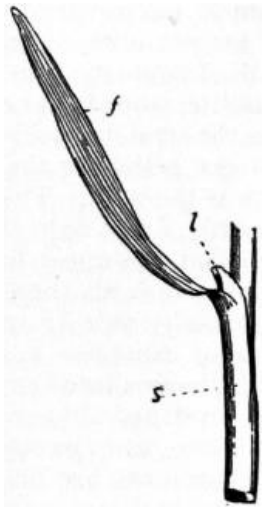



FIG. 5.—Stem of a Grass (*Poa*) with leaf. The sheaths ending in a process *l*, called a ligule; the blade of the leaf, *f*.

FIG. 6.—Leaf of a Fan Palm (*Chamaerops*), showing the veins running from the base to the margin, and not forming an angular network.

In all plants, except Thallophytes, leaves are present at some period of their existence. In *Cuscuta* (Dodder) (*q.v.*), however, we have an exception. The forms assumed by leaves vary much, not only in different plants, but in the same plant. It is only amongst the lower classes of plants—Mosses, Characeae, &c.—that all the leaves on a plant are similar. As we pass up the scale of plant life we find them becoming more and more variable. The structures in ordinary language designated as leaves are considered so *par excellence*, and they are frequently spoken of as *foliage leaves*. In relation to their production on the stem we may observe that when they are small they are always produced in great number, and as they increase in size their number diminishes correspondingly. The cellular process from the axis which develops into a leaf is simple and undivided; it rarely remains so, but in progress of growth becomes segmented in various ways, either longitudinally or laterally, or in both ways. By longitudinal segmentation we have a leaf formed consisting of sheath, stalk and blade; or one or other of these may be absent, and thus stalked, sessile, sheathing, &c., leaves are produced. Lateral segmentation affects the lamina, producing indentations, lobings or fissuring of its margins. In this way two marked forms of leaf are produced—(1) *Simple* form, in which the segmentation, however deeply it extends into the lamina, does not separate portions of the lamina which become articulated with the midrib or petiole; and (2) *Compound* form, where portions of the lamina are separated as detached *leaflets*, which become articulated with the midrib or petiole. In both simple and compound leaves, according to the amount of segmentation and the mode of development of the parenchyma

and direction of the fibro-vascular bundles, many forms are produced.

*Simple Leaves.*—When the parenchyma is developed symmetrically on each side of the midrib or stalk, the leaf is *equal*; if otherwise, the leaf is *unequal* or *oblique* (fig. 3). If the margins are even and present no divisions, the leaf is *entire* (fig. 7); if there are slight projections which are more or less pointed, the leaf is *dentate* or toothed; when the projections lie regularly over each other, like the teeth of a saw, the leaf is *serrate* (fig. 3); when they are rounded the leaf is *crenate*. If the divisions extend more deeply into the lamina than the margin, the leaf receives different names according to the nature of the segments; thus, when the divisions extend about half-way down (fig. 8), it is *cleft*; when the divisions extend nearly to the base or to the midrib the leaf is *partite*.

***Simple leaves.***

If these divisions take place in a simple *feather-veined* leaf it becomes either *pinnatifid* (fig. 9), when the segments extend to about the middle, or *pinnatipartite*, when the divisions extend nearly to the midrib. These primary divisions may be again subdivided in a similar manner, and thus a feather-veined leaf will become *bipinnatifid* or *bipinnatipartite*; still further subdivisions give origin to *tripinnatifid* and *laciniated* leaves. The same kinds of divisions taking place in a simple leaf with palmate or *radiating* venation, give origin to *lobed*, *cleft* and *partite* forms. The name *palmate* or *palmatifid* (fig. 4) is the general term applied to leaves with radiating venation, in which there are several lobes united by a broad expansion of parenchyma, like the palm of the hand, as in the sycamore, castor-oil plant, &c. The divisions of leaves with radiating venation may extend to near the base of the leaf, and the names *bipartite*, *tripartite*, *quinquepartite*, &c., are given according as the partitions are two, three, five or more. The term *dissected* is applied to leaves with radiating venation, having numerous narrow divisions, as in *Geranium dissectum*.

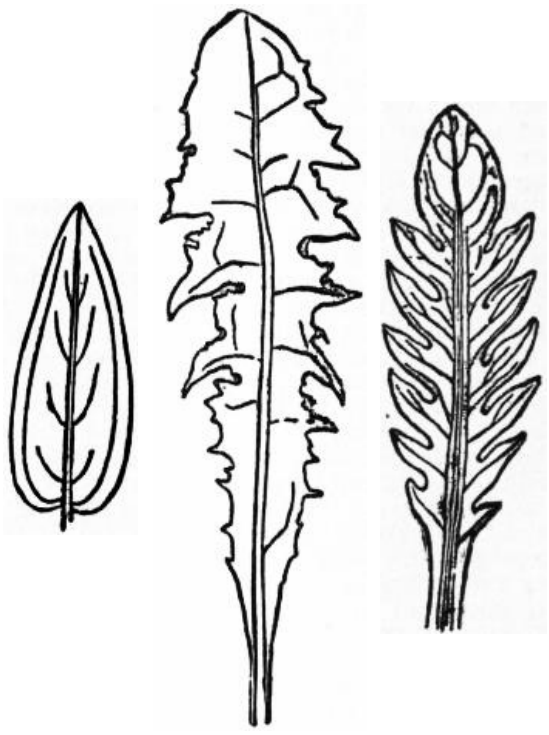


FIG. 7. FIG. 8. FIG. 9.

FIG. 7.—Ovate acute leaf of *Coriara myrtifolia*. Besides the midrib there are two intra-marginal ribs which converge to the apex. The leaf is therefore tricostate.

FIG. 8.—Runcinate leaf of Dandelion. It is a pinnatifid leaf, with the divisions pointing towards the petiole and a large triangular apex.

FIG. 9.—Pinnatifid leaf of *Valeriana dioica*.

FIG. 10.—Five-partite leaf of Aconite.

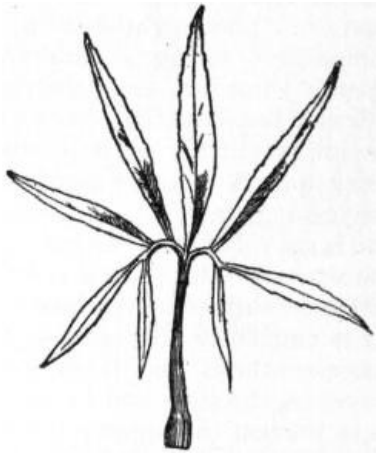


FIG. 11.—Pedate leaf of Stinking Hellebore (*Helleborus foetidus*). The venation is radiating. It is a palmately-partite leaf, in which the lateral lobes are deeply divided. When the leaf hangs down it resembles the foot of a bird, and hence the name.

When in a radiating leaf there are three primary partitions, and the two lateral lobes are again cleft, as in hellebore (fig. 11), the leaf is called *pedate* or *pedatifid*, from a fancied resemblance to the claw of a bird. In all the instances already alluded to the leaves have been considered as flat expansions, in which the ribs or veins spread out on the same plane with the stalk. In some cases, however, the veins spread at right angles to the stalk, forming a *peltate* leaf as in Indian cress (fig. 12).

The form of the leaf shows a very great variety ranging from the narrow *linear* form with parallel sides, as in grasses or the needle-like leaves of pines and firs to more or less rounded or *orbicular*—descriptions of these will be found in works on descriptive botany—a few examples are illustrated here (figs. 7, 13, 14, 15). The apex also varies considerably, being rounded, or *obtuse*, sharp or *acute* (fig. 7), notched (fig. 15), &c. Similarly the shape of the base may vary, when rounded lobes are formed, as in dog-violet, the leaf is cordate or heart-shaped; or kidney-shaped or *reniform* (fig. 16), when the apex is rounded as in ground ivy. When the lobes are prolonged downwards and are acute, the leaf is *sagittate* (fig. 17); when they proceed at right angles, as in *Rumex Acetosella*, the leaf is *hastate* or halbert-shaped. When a simple leaf is divided at the base into two leaf-like appendages, it is called *auriculate*. When the development of parenchyma is such that it more than fills up the spaces between the veins, the margins become *wavy*, *crisp* or *undulated*, as in *Rumex crispus* and *Rheum undulatum*. By cultivation the cellular tissue is often much increased, giving rise to the *curled* leaves of greens, savoys, cresses, lettuce, &c.



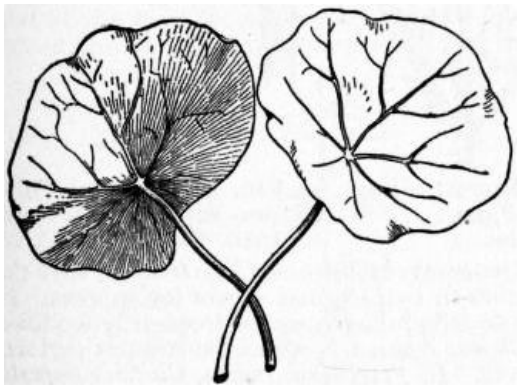


FIG. 12.—Peltate leaves of Indian Cress (*Tropaeolum majus*).

FIG. 13.—Lanceolate leaf of a species of Senna.

Compound leaves are those in which the divisions extend to the midrib or petiole, and the separated portions become each articulated with it, and receive the name of *leaflets*. The midrib, or petiole, has thus the appearance of a branch with separate leaves attached to it, but it is considered properly as one leaf, because in its earliest state it arises from the axis as

***Compound leaves.*** a single piece, and its subsequent divisions in the form of leaflets are all in one plane. The leaflets are either sessile (fig. 18) or have stalks, called *petiolules* (fig. 19). Compound leaves are pinnate (fig. 19) or palmate (fig. 18) according to the arrangement of leaflets. When a pinnate leaf ends in a pair of pinnae it is *equally* or *abruptly pinnate* (paripinnate); when there is a single terminal leaflet (fig. 19), the leaf is *unequally pinnate* (imparipinnate); when the leaflets or pinnae are placed alternately on either side of the midrib, and not directly opposite to each other, the leaf is *alternately pinnate*; and when the pinnae are of different sizes, the leaf is *interruptedly pinnate*. When the division is carried into the second degree, and the pinnae of a compound leaf are themselves pinnately compound, a bipinnate leaf is formed.

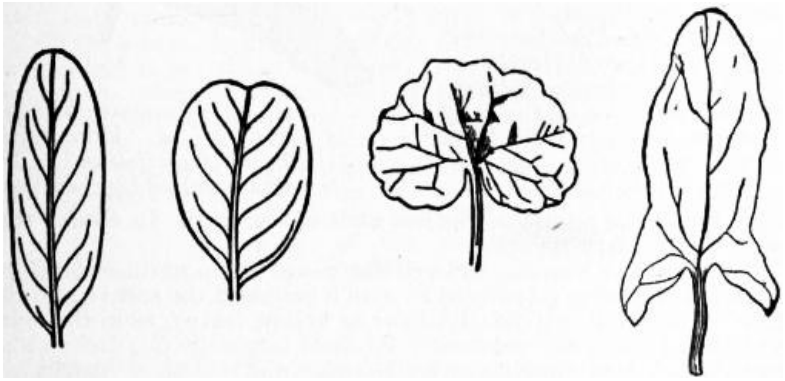


FIG. 14. FIG. 15. FIG. 16. FIG. 17.

FIG. 14.—Oblong leaf of a species of Senna.

FIG. 15.—Emarginate leaf of a species of Senna. The leaf in its contour is somewhat obovate, or inversely egg-shaped, and its base is oblique.

FIG. 16.—Reniform leaf of *Nepeta Glechoma*, margin crenate.

FIG. 17.—Sagittate leaf of Convolvulus.

FIG. 18.—Palmately compound leaf of the Horse-chestnut (*Aesculus Hippocastanum*).

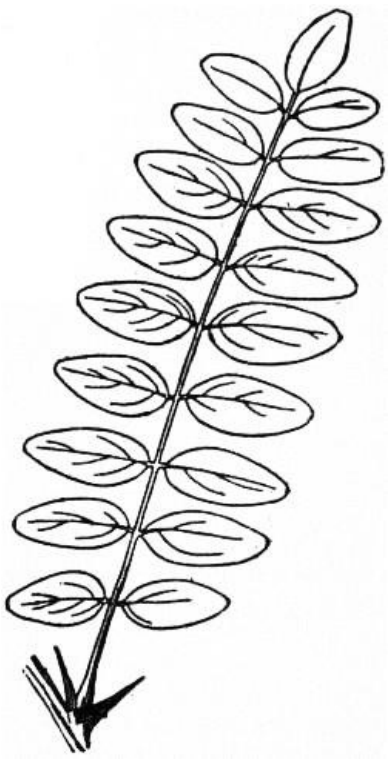


FIG. 19.—Imparipinnate (unequal pinnate) leaf of Robinia. There are nine pairs of shortly-stalked leaflets (foliola, pinnae), and an odd one at the extremity. At the base of the leaf the spiny stipules are seen.

The *petiole* or leaf-stalk is the part which unites the limb or blade of the leaf to the stem. It is absent in *sessile* leaves, and this is also frequently the case when a sheath is present, as in grasses (fig. 5). It consists of the fibro-vascular bundles with a varying amount of cellular

**Petiole.** tissue. When the vascular bundles reach the base of the lamina they separate and spread out in various ways, as already described under venation. The lower part of the petiole is often swollen (fig. 20, *p*), forming the *pulvinus*, formed of cellular tissue, the cells of which exhibit the phenomenon of irritability. In *Mimosa pudica* (fig. 20) a sensitiveness is located in the pulvinus which upon irritation induces a depression of the whole bipinnate leaf, a similar property exists in the pulvini at the base of the leaflets which fold upwards. The petiole varies in length, being usually shorter than the lamina, but sometimes much longer. In some palms it is 15 or 20 ft. long, and is so firm as to be used for poles or walking-sticks. In general, the petiole is more or less rounded in its form, the upper surface being flattened or grooved. Sometimes it is compressed laterally, as in the aspen, and to this peculiarity the trembling of the leaves of this tree is due. In aquatic plants the leaf-stalk is sometimes distended with air, as in *Pontederia* and *Trapa*, so as to float the leaf. At other times it is *winged*, and is either leafy, as in the orange (fig. 21, *p*), lemon and *Dionaea*, or pitcher-like, as in *Sarracenia* (fig. 22). In some Australian acacias, and in some species of *Oxalis* and *Bupleurum*, the petiole is flattened in a vertical direction, the vascular bundles separating immediately after quitting the stem and running nearly parallel from base to apex. This kind of petiole (fig. 23, *p*) has been called a *phyllode*. In these plants the laminae or blades of the leaves are pinnate or bipinnate, and are produced at the extremities of the phyllodes in a horizontal direction; but in many instances they are not developed, and the phyllode serves the purpose of a leaf. These phyllodes, by their vertical position and their peculiar form, give a remarkable aspect to vegetation. On the same acacia there occur leaves with the petiole and lamina perfect; others having the petiole slightly expanded or winged, and the lamina imperfectly developed; and others in which there is no lamina, and the petiole becomes large and broad. Some petioles are long, slender and sensitive to contact, and function as tendrils by means of which the plant climbs; as in the nasturtiums (*Tropaeolum*), clematis and others; and in compound leaves the midrib and some of the leaflets may similarly be transformed into tendrils, as in the pea and vetch.

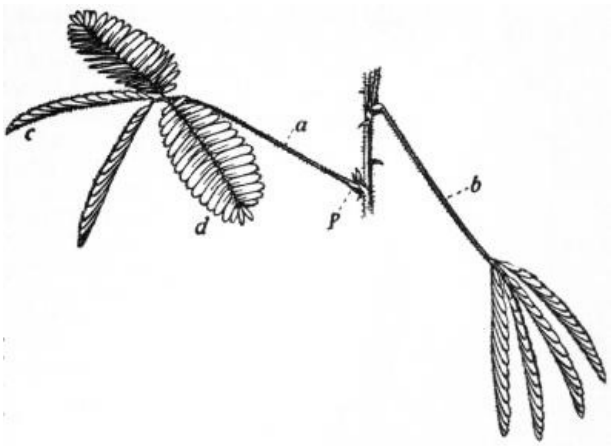



FIG. 20.—Branch and leaves of the Sensitive plant (*Mimosa pudica*), showing the petiole in its erect state, *a*, and in its depressed state, *b*; also the leaflets closed, *c*, and the leaflets expanded, *d*. Irritability resides in the pulvinus, *p*.

The leaf base is often developed as a *sheath* (*vagina*), which embraces the whole or part of the circumference of the stem (fig. 5). This sheath is comparatively rare in dicotyledons, but is seen in umbelliferous plants. It is much more common amongst monocotyledons. In sedges the sheath forms a complete investment of the stem, whilst in grasses it is split on one side. In the latter plants there is also a membranous outgrowth, the *ligule*, at right angles to the median plane of the leaf from the point where the sheath passes into the lamina, there being no petiole (fig. 5, *l*).

**Leaf base.**

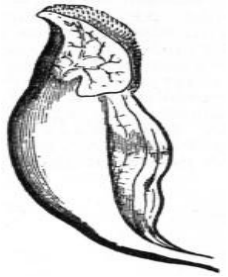



FIG. 21.—Leaf of Orange (*Citrus Aurantium*), showing a winged leafy petiole *p*, which is articulated to the lamina *l*.

FIG. 22.—Pitcher (*ascidium*) of a species of Side-saddle plant (*Sarracenia purpurea*). The pitcher is formed from the petiole, which is prolonged.

In leaves in which no sheath is produced we not infrequently find small foliar organs, *stipules*, at the base of the petiole (fig. 24, *s*). The stipules are generally two in number, and they are important as supplying characters in certain natural orders. Thus they occur in the pea and bean family, in rosaceous plants and the family Rubiaceae. They are not common in dicotyledons with opposite leaves. Plants having stipules are called *stipulate*; those having none are *exstipulate*. Stipules may be large or small, entire or divided, deciduous or persistent. They are not usually of the same form as the ordinary foliage leaves of the plant, from which they are distinguished by their lateral position at the base of the petiole. In the pansy (fig. 24) the true leaves are stalked and crenate, while the stipules *s* are large, sessile and pinnatifid. In *Lathyrus Aphaca* and some other plants the true pinnate leaves are abortive, the petiole forms a tendril, and the stipules alone are developed, performing the office of leaves. When stipulate leaves are opposite to each other, at the same height on the stem, it occasionally happens that the stipules on the two sides unite wholly or partially, so as to form an *interpetiolary* or *interfoliar* stipule, as in members of the family Rubiaceae. In the case of alternate leaves, the stipules at the base of each leaf are sometimes united to the petiole and to each other, so as to form an *adnate*, *adherent* or *petiolary* stipule, as in the rose, or an *axillary* stipule, as in *Houttuynia cordata*. In other instances the stipules unite together on the side of the stem opposite the leaf forming an *ocrea*, as in the dock family (fig. 25).



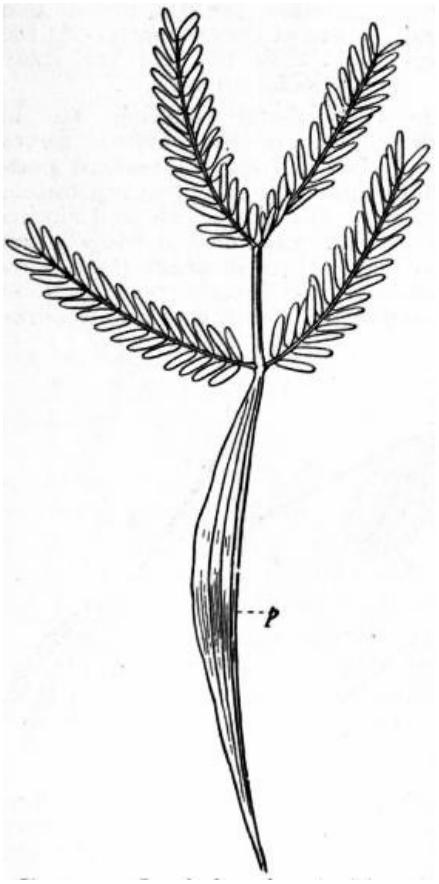



FIG. 23.—Leaf of an Acacia (*Acacia heterophylla*), showing a flattened leaf-like petiole *p*, called a phyllode, with straight venation, and a bipinnate lamina.

In the development of the leaf the stipules frequently play a most important part. They begin to be formed after the origin of the leaves, but grow much more rapidly than the leaves, and in this way they arch over the young leaves and form protective chambers wherein the parts of the leaf may develop. In the figs, magnolia and pondweeds they are very large and completely envelop the young leaf-bud. The stipules are sometimes so minute as to be scarcely distinguishable without the aid of a lens, and so fugacious as to be visible only in the very young state of the leaf. They may assume a hard and spiny character, as in *Robinia Pseudacacia* (fig. 19), or may be cirrose, as in *Smilax*, where each stipule is represented by a tendril. At the base of the leaflets of a compound leaf, small stipules (*stipels*) are occasionally produced.


FIG. 24.—Leaf of Pansy. *s*, Stipules.

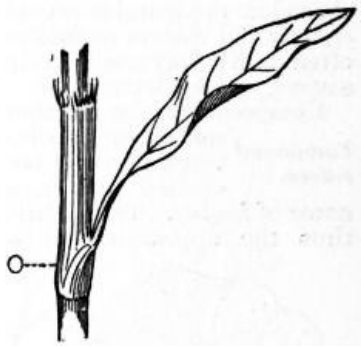


FIG. 25.—Leaf of Polygonum, with part of stem. *o*, Ocrea.

Variations in the structure and forms of leaves and leafstalks are produced by the increased development of cellular tissue, by the abortion or degeneration of parts, by the multiplication or repetition of parts and by adhesion. When cellular tissue is developed to a great extent, leaves become succulent and occasionally assume a crisp or curled appearance. Such changes take place naturally, but they are often increased by the art of the gardener, and the object of many horticultural operations is to increase the bulk and succulence of leaves. It is in this way that cabbages and savoys are rendered more delicate and nutritious. By a deficiency in development of parenchyma and an increase in the mechanical tissue, leaves are liable to become hardened and spinescent. The leaves of barberry and of some species of *Astragalus*, and the stipules of the false acacia (*Robinia*) are spiny. To the same cause is due the spiny margin of the holly-leaf. When two lobes at the base of a leaf are prolonged beyond the stem and unite (fig. 26), the leaf is *perfoliate*, the stem appearing to pass through it, as in *Bupleurum perfoliatum* and *Chlora perfoliata*; when two leaves unite by their bases they become *connate* (fig. 27), as in *Lonicera Caprifolium*; and when leaves adhere to the stem, forming a sort of winged or leafy appendage, they are *decurrent*, as in thistles. The formation of peltate leaves has been traced to the union of the lobes of a cleft leaf. In the leaf of the *Victoria regia* the transformation may be traced during germination. The first leaves produced by the young plant are linear, the second are sagittate and hastate, the third are rounded-cordate and the next are orbicular. The cleft indicating the union of the lobes remains in the large leaves. The parts of the leaf are frequently transformed into *tendrils*, with the view of enabling the plants to twine round others for support. In Leguminous plants (the pea tribe) the pinnae are frequently modified to form tendrils, as in *Lathyrus Aphaca*, in which the stipules perform the function of true leaves. In *Flagellaria indica*, *Gloriosa superba* and others, the midrib of the leaf ends in a tendril. In *Smilax* there are two stipulary tendrils.

***Modifications.***

FIG. 26.—Perfoliate leaf of a species of Hare's-ear (*Bupleurum rotundifolium*). The two lobes at the base of the leaf are united, so that the stalk appears to come through the leaf.

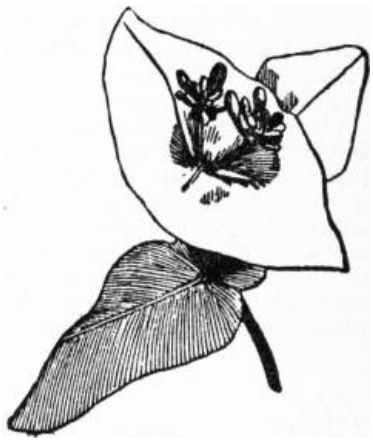


FIG. 27.—Connate leaves of a species of Honeysuckle (*Lonicera Caprifolium*). Two leaves are united by their bases.

The vascular bundles and cellular tissue are sometimes developed in such a way as to form a circle, with a hollow in the centre, and thus

give rise to what are called *fistular* or hollow leaves, as in the onion, and to *ascidia* or *pitchers*. Pitchers are formed either by petioles or by laminae, and they are composed of one or more leaves. In *Sarracenia* (fig. 22) and *Heliamphora* the pitcher is composed of the petiole of the leaf. In the pitcher plant, *Nepenthes*, the pitcher is a modification of the lamina, the petiole often plays the part of a tendril, while the leaf base is flat and leaf-like (fig. 28).

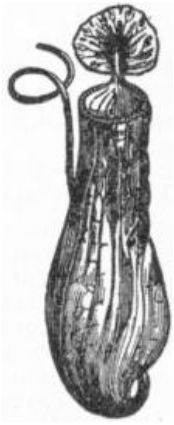


FIG. 28.—Pitcher of a species of pitcher-plant (*Nepenthes distillatoria*).

In *Utricularia* bladder-like sacs are formed by a modification of leaflets on the submerged leaves.

In some cases the leaves are reduced to mere *scales—cataphyllary* leaves; they are produced abundantly upon underground shoots. In parasites (*Lathraea*, *Orobanche*) and in plants growing on decaying vegetable matter (*saprophytes*), in which no chlorophyll is formed, these scales are the only leaves produced. In *Pinus* the only leaves produced on the main stem and the lateral shoots are scales, the acicular leaves of the tree growing from axillary shoots. In *Cycas* whorls of scales alternate with large pinnate leaves. In many plants, as already noticed, phyllodia or stipules perform the function of leaves. The production of leaf-buds from leaves sometimes occurs as in *Bryophyllum*, and many plants of the order Gesneraceae. The leaf of Venus's fly-trap (*Dionaea muscipula*) when cut off and placed in damp moss, with a pan of water underneath and a bell-glass for a cover, has produced buds from which young plants were obtained. Some species of saxifrage and of ferns also produce buds on their leaves and fronds. In *Nymphaea micrantha* buds appear at the upper part of the petiole.



***Phyllotaxis.*** Leaves occupy various positions on the stem and branches, and have received different names according to their situation. Thus leaves arising from the crown of the root, as in the primrose, are called *radical*; those on the stem are *cauline*; on flower-stalks, *floral* leaves (see FLOWER). The first leaves developed are known as seed leaves or *cotyledons*. The arrangement of the leaves on the axis and its appendages is called *phyllotaxis*.

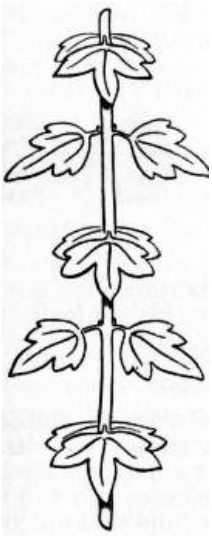


FIG. 29.—A stem with opposite leaves. The pairs are placed at right angles alternately, or in what is called a decussate manner. In the lowest pair one leaf is in front and the other at the back; in the second pair the leaves are placed laterally, and so on.

FIG. 30.—A stem with alternate leaves, arranged in a pentastichous or quincuncial manner. The sixth leaf is directly above the first, and commences the second cycle. The fraction of the circumference of the stem expressing the divergence of the leaves is two-fifths.

In their arrangement leaves follow a definite order. The points on the stem at which leaves appear are called nodes; the part of the stem between the nodes is the *internode*. When two leaves are produced at the same node, one on each side of the stem or axis, and at the same level, they are *opposite* (fig. 29); when more than two are produced they are *verticillate*, and the circle of leaves is then called a *verticil* or *whorl*. When leaves are opposite, each successive pair may be placed at right angles to the pair immediately preceding. They are then said to *decussate*, following thus a law of alternation (fig. 29). The same occurs in the verticillate arrangement, the leaves of each whorl rarely being *superposed* on those of the whorl next it, but usually alternating so that each leaf in a whorl occupies the space between two leaves of the whorl next to it. There are considerable irregularities, however, in this

respect, and the number of leaves in different whorls is not always uniform, as may be seen in *Lysimachia vulgaris*. When a single leaf is produced at a node, and the nodes are separated so that each leaf is placed at a different height on the stem, the leaves are *alternate* (fig. 30). A plane passing through the point of insertion of the leaf in the node, dividing the leaf into similar halves, is the median plane of the leaf; and when the leaves are arranged alternately on an axis so that their median planes coincide they form a straight row or *orthostichy*. On every axis there are usually two or more orthostichies. In fig. 31, leaf 1 arises from a node *n*; leaf 2 is separated from it by an internode m, and is placed to the right or left; while leaf 3 is situated directly above leaf 1. In this case, then, there are two orthostichies, and the arrangement is said to be *distichous*. When the fourth leaf is directly above the first, the arrangement is *tristichous*. The same arrangement continues throughout the branch, so that in the latter case the 7th leaf is above the 4th, the 10th above the 7th; also the 5th above the 2nd, the 6th above the 3rd and so on. The size of the angle between the median planes of two consecutive leaves in an alternate arrangement is their *divergence*; and it is expressed in fractions of the circumference of the axis which is supposed to be a circle. In a regularly-formed straight branch covered with leaves, if a thread is passed from one to the other, turning always in the same direction, a spiral is described, and a certain number of leaves and of complete turns occur before reaching the leaf directly above that from which the enumeration commenced. If this arrangement is expressed by a fraction, the numerator of which indicates the number of turns, and the denominator the number of internodes in the spiral cycle, the fraction will be found to represent the angle of divergence of the consecutive leaves on the axis. Thus, in fig. 32, *a*, *b*, the cycle consists of five leaves, the 6th leaf being placed vertically over the 1st, the 7th over the 2nd and so on; while the number of turns between the 1st and 6th leaf is two; hence this arrangement is indicated by the fraction ⅖. In other words, the distance or divergence between the first and second leaf, expressed in parts of a circle, is ⅖ of a circle or 360° × ⅖ = 144°. In fig. 31, *a*, *b*, the spiral is ½, *i.e.* one turn and two leaves; the third leaf being placed vertically over the first, and the divergence between the first and second leaf being one-half the circumference of a circle, 360° × ½ = 180°. Again, in a tristichous arrangement the number is ⅓, or one turn and three leaves, the angular divergence being 120°.

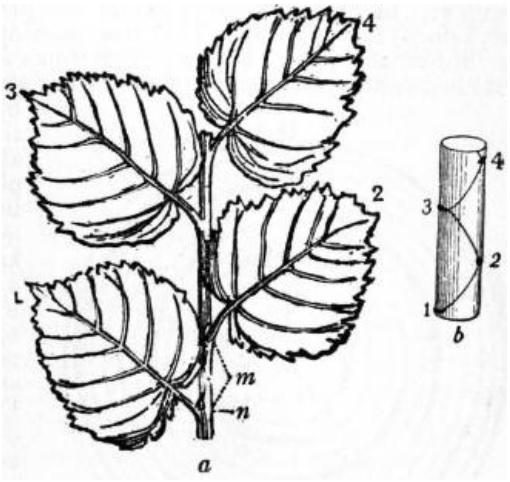



FIG. 31.—Portion of a branch of a Lime tree, with four leaves arranged in a distichous manner, or in two rows. *a*, The branch with the leaves numbered in their order, *n* being the node and *m* the internode; *b* is a magnified representation of the branch, showing the points of insertion of the leaves and their spiral arrangement, which is expressed by the fraction ½, or one turn of the spiral for two internodes.

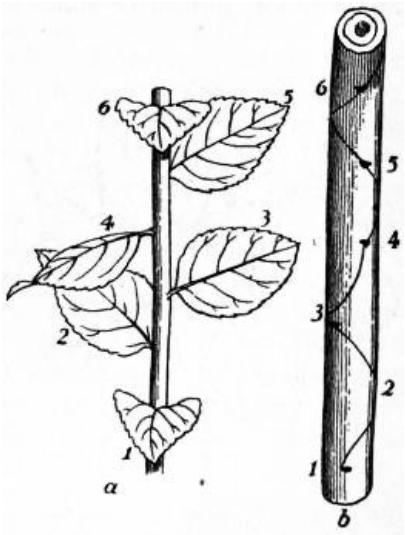



FIG. 32.—Part of a branch of a Cherry with six leaves, the sixth being placed vertically over the first, after two turns of the spiral. This is expressed by two-fifths. *a*, The branch, with the leaves numbered in order; *b*, a magnified representation of the branch, showing the points of insertion of the leaves and their spiral arrangement.

By this means we have a convenient mode of expressing on paper the exact position of the leaves upon an axis. And in many cases such a mode of expression is of excellent service in enabling us readily to understand the relations of the leaves. The divergences may also be represented diagrammatically on a horizontal projection of the vertical axis, as in fig. 33. Here the outermost circle represents a section of that portion of the axis bearing the lowest leaf, the innermost represents the highest. The broad dark lines represent the leaves, and they are numbered according to their age and position. It will be seen at once that the leaves are arranged in orthostichies marked I.-V., and that these divide the circumference into five

equal portions. But the divergence between leaf 1 and leaf 2 is equal to $^2/_5$ths of the circumference, and the same is the case between 2 and 3, 3 and 4, &c. The divergence, then, is $^2/_5$, and from this we learn that, starting from any leaf on the axis, we must pass twice round the stem in a spiral through five leaves before reaching one directly over that with which we started. The line which, winding round an axis either to the right or to the left, passes through the points of insertion of all the leaves on the axis is termed the *genetic* or *generating spiral*; and that margin of each leaf which is towards the direction from which the spiral proceeds is the *kathodic* side, the other margin facing the point whither the spiral passes being the *anodic* side.

In cases where the internodes are very short and the leaves are closely applied to each other, as in the house-leek, it is difficult to trace the *generating spiral*. Thus, in fig. 34 there are thirteen leaves which are numbered in their order, and five turns of the spiral marked by circles in the centre ($^5/_{13}$ indicating the arrangement); but this could not be detected at once. So also in fir cones (fig. 35), which are composed of scales or modified leaves, the generating spiral cannot be determined easily. But in such cases a series of *secondary spirals* or *parastichies* are seen running parallel with each other both right and left, which to a certain extent conceal the genetic spiral.

The spiral is not always constant throughout the whole length of an axis. The angle of divergence may alter either abruptly or gradually, and the phyllotaxis thus becomes very complicated. This change may be brought about by arrest of development, by increased development of parts or by a torsion of the axis. The former are exemplified in many Crassulaceae and aloes. The latter is seen well in the screw-pine (*Pandanus*). In the bud of the screw-pine the leaves are arranged in three orthostichies with the phyllotaxis $^1/_3$, but by torsion the developed leaves become arranged in three strong spiral rows running round the stem. These causes of change in phyllotaxis are also well exemplified in the alteration of an opposite or verticillate arrangement to an alternate, and vice versa; thus the effect of interruption of growth, in causing alternate leaves to become opposite and verticillate, can be distinctly shown in *Rhododendron ponticum*. The primitive or generating spiral may pass either from right to left or from left to right. It sometimes follows a different direction in the branches from that pursued in the stem. When it follows the same course in the stem and branches, they are *homodromous*; when the direction differs, they are *heterodromous*. In different species of the same genus the phyllotaxis frequently varies.

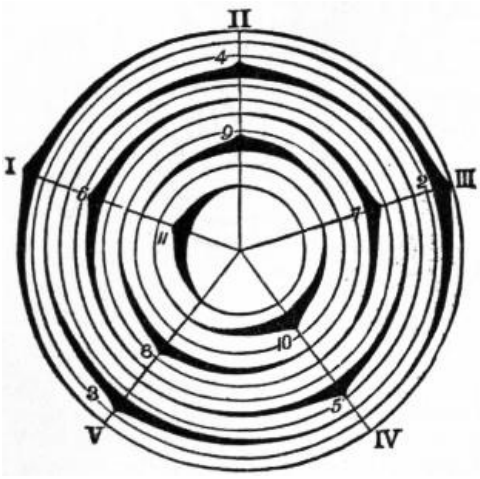


FIG. 33.—Diagram of a phyllotaxis represented by the fraction $^2/_5$.



All modifications of leaves follow the same laws of arrangement as true leaves—a fact which is of importance in a morphological point of view. In dicotyledonous plants the first leaves produced (the cotyledons) are opposite. This arrangement often continues during the life of the plant, but at other times it changes, passing into distichous and spiral forms. Some tribes of plants are distinguished by their opposite or verticillate, others by their alternate, leaves. Labiate plants have decussate leaves, while Boraginaceae have alternate leaves, and Tiliaceae usually have distichous leaves; Rubiaceae have opposite leaves. Such arrangements as $^2/_5$, $^3/_8$, $^5/_{13}$ and $^8/_{21}$ are common in Dicotyledons. The first of these, called a *quincunx*, is met with in the apple, pear and cherry (fig. 32); the second, in the bay, holly, *Plantago media*; the third, in the cones of *Picea alba* (fig. 35); and the fourth in those of the silver fir. In monocotyledonous plants there is only one seed-leaf or cotyledon, and hence the arrangement is at first alternate; and it generally continues so more or less, rarely being verticillate. Such arrangements as $^1/_2$, $^1/_3$ and $^2/_3$ are common in Monocotyledons, as in grasses, sedges and lilies. It has been found in general that, while the number 5 occurs in the phyllotaxis of Dicotyledons, 3 is common in that of Monocotyledons.

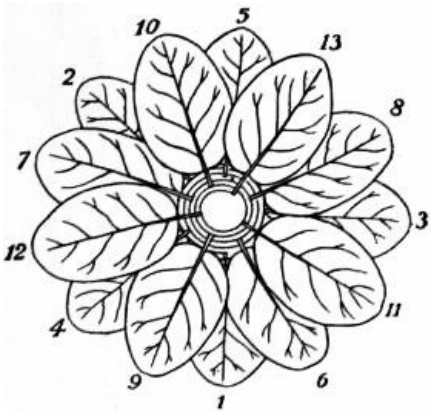



FIG. 34.—Cycle of thirteen leaves placed closely together so as to form a rosette, as in *Sempervivum*. A is the very short axis to which the leaves are attached. The leaves are numbered in their order, from below upwards. The circles in the centre indicate the five turns of the spiral, and show the insertion of each of the leaves. The divergence is expressed by the fraction $^{5}/_{13}$ths.

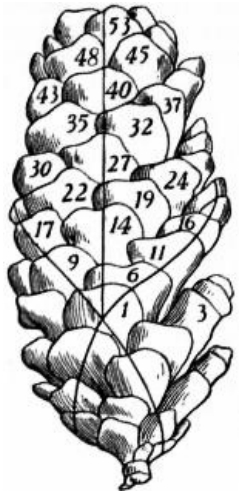



FIG. 35.—Cone of *Picea alba* with the scales or modified leaves numbered in the order of their arrangement on the axis of the cone. The lines indicate a rectilinear series of scales and two lateral secondary spirals, one turning from left to right, the other from right to left.

In the axil of previously formed leaves leaf-buds arise. These leaf-buds contain the rudiments of a shoot, and consist of leaves covering a growing point. The buds of trees of temperate climates, which lie dormant during the winter, are protected by scale leaves. These scales or protective appendages of the bud consist either of the altered laminae or of the enlarged petiolary sheath, or of stipules, as in the fig and magnolia, or of one or two of these parts combined. These are often of a coarse nature, serving a temporary purpose, and then falling off when the leaf is expanded. They are frequently covered with a resinous matter, as in balsam-poplar and horse-chestnut, or by a thick downy covering as in the willow. In plants of warm climates the buds have often no protective appendages, and are then said to be *naked*.

FIG. 36.

FIG. 37.

FIG. 38.

FIG. 39.

FIG. 40.

FIG. 41.

FIG. 36.—Circinate vernation.
FIG. 37.—Transverse section of a conduplicate leaf.
FIG. 38.—Transverse section of a plicate or plaited leaf.
FIG. 39.—Transverse section of a convolute leaf.
FIG. 40.—Transverse section of an involute leaf.
FIG. 41.—Transverse section of a revolute leaf.

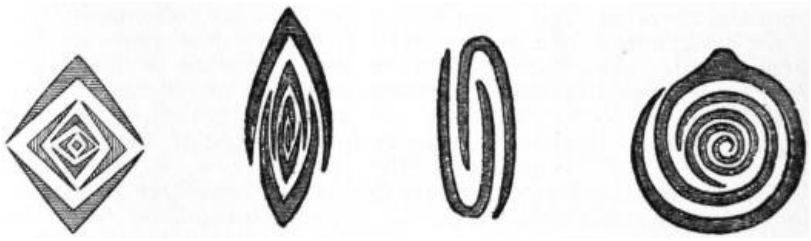


FIG. 42. FIG. 43. FIG. 44. FIG. 45.

FIG. 42.—Transverse section of a bud, in which the leaves are arranged in an accumbent manner.

FIG. 43.—Transverse section of a bud, in which the leaves are arranged in an equitant manner.

FIG. 44.—Transverse section of a bud, showing two leaves folded in an obvolute manner. Each is conduplicate, and one embraces the edge of the other.

FIG. 45.—Transverse section of a bud, showing two leaves arranged in a supervolute manner.

The arrangement of the leaves in the bud is termed *vernation* or *prefoliation*. In considering vernation we must take into account both the manner in which each individual leaf is folded and also the arrangement of the leaves in relation to each other. These vary in different plants, but in each species they follow a regular law. The leaves in the bud are either placed simply in apposition, as in the mistletoe, or they are folded or rolled up longitudinally or laterally, giving rise to different kinds of vernation, as delineated in figs. 36 to 45, where the folded or curved lines represent the leaves, the thickened part being the midrib. The leaf taken individually is either folded longitudinally from apex to base, as in the tulip-tree, and called *reclinate* or *replicate*; or rolled up in a circular manner from apex to base, as in ferns (fig. 36), and called *circinate*; or folded laterally, *conduplicate* (fig. 37), as in oak; or it has several folds like a fan, *plicate* or *plaited* (fig. 38), as in vine and sycamore, and in leaves with radiating vernation, where the ribs mark the foldings; or it is rolled upon itself, *convolute* (fig. 39), as in banana and apricot; or its edges are rolled inwards, *involute* (fig. 40), as in violet; or outwards, *revolute* (fig. 41), as in rosemary. The different divisions of a cut leaf may be folded or rolled up separately, as in ferns, while the entire leaf may have either the same or a different kind of vernation. The leaves have a definite relation to each other in the bud, being either opposite, alternate or verticillate; and thus different kinds of vernation are produced. Sometimes they are nearly in a circle at the same level, remaining flat or only slightly convex externally, and placed so as to touch each other by their edges, thus giving rise to *valvate* vernation. At other times they are at different levels, and are applied over each other, so as to be *imbricated*, as in lilac, and in the outer scales of sycamore; and occasionally the margin of one leaf overlaps that of another, while it in its turn is overlapped by a third, so as to be *twisted*, *spiral* or *contortive*. When leaves are applied to each other face to face, without being folded or rolled together, they are *appressed*. When the leaves are more completely folded they either touch at their extremities and are *accumbent* or *opposite* (fig. 42), or are folded inwards by their margin and become *induplicate*; or a conduplicate leaf covers another similarly folded, which in turn covers a third, and thus the vernation is *equitant* (fig. 43), as in privet; or conduplicate leaves are placed so that the half of the one covers the half of another, and thus they become *half-equitant* or *obvolute* (fig. 44), as in sage. When in the case of convolute leaves one leaf is rolled up within the other, it is *supervolute* (fig. 45). The scales of a bud sometimes exhibit one kind of vernation and the leaves another. The same modes of arrangement occur in the flower-buds.

Leaves, after performing their functions for a certain time, wither and die. In doing so they frequently change colour, and hence arise the beautiful and varied tints of the autumnal foliage. This change of colour is chiefly occasioned by the diminished circulation in the leaves, and the higher degree of oxidation to which their chlorophyll has been submitted.



Leaves which are articulated with the stem, as in the walnut and horse-chestnut, fall and leave a scar, while those which are continuous with it remain attached for some time after they have lost their vitality. Most of the trees of Great Britain have deciduous leaves, their duration not extending over more than a few months, while in trees of warm climates the leaves often remain for two or more years. In tropical countries, however, many trees lose their leaves in the dry season. The period of defoliation varies in different countries according to the nature of their climate. Trees which are called evergreen, as pines and evergreen-oak, are always deprived of a certain number of leaves at intervals, sufficient

being left, however, to preserve their green appearance. The cause of the fall of the leaf in cold climates seems to be deficiency of light and heat in winter, which causes a cessation in the functions of the cells of the leaf. The fall is directly caused by the formation of a layer of tissue across the base of the leaf-stalk; the cells of this layer separate from one another and the leaf remains attached only by the fibres of the veins until it becomes finally detached by the wind or frost. Before its fall the leaf has become dry owing to loss of water and the removal of the protoplasm and food substances to the stem for use next season; the red and yellow colouring matters are products of decomposition of the chlorophyll. Inorganic and other waste matters are stored in the leaf-tissue and thus got rid of by the plant. The leaf scar is protected by a corky change (suberization) in the walls of the exposed cells.

(A. B. R.)

LEAF-INSECT, the name given to orthopterous insects of the family Phasmidae, referred to the single genus *Phyllium* and characterized by the presence of lateral laminae upon the legs and abdomen, which, in association with an abundance of green colouring-matter, impart a broad and leaf-like appearance to the whole insect. In the female this deceptive resemblance is enhanced by the large size and foliaceous form of the front wings which, when at rest edge to edge on the abdomen, forcibly suggest in their neuration the midrib and costae of an ordinary leaf. In this sex the posterior wings are reduced and functionless so far as flight is concerned; in the male they are ample, membranous and functional, while the anterior wings are small and not leaf-like. The freshly hatched young are reddish in colour; but turn green after feeding for a short time upon leaves. Before death a specimen has been observed to pass through the various hues of a decaying leaf, and the spectrum of the green colouring matter does not differ from that of the chlorophyll of living leaves. Since leaf-insects are purely vegetable feeders and not predaceous like mantids, it is probable that their resemblance to leaves is solely for purposes of concealment from enemies. Their egg capsules are similarly protected by their likeness to various seeds. Leaf-insects range from India to the Seychelles on the one side, and to the Fiji Islands on the other.

(R. I. P.)

LEAGUE. 1. (Through Fr. *ligue*, Ital. *liga*, from Lat. *ligare*, to bind), an agreement entered into by two or more parties for mutual protection or joint attack, or for the furtherance of some common object, also the body thus joined or "leagued" together. The name has been given to numerous confederations, such as the Achaean League (*q.v.*), the confederation of the ancient cities of Achaia, and especially to the various holy leagues (*ligues saintes*), of which the better known are those formed by Pope Julius II. against Venice in 1508, often known as the League of Cambrai, and against France in 1511. "The League," in French history, is that of the Catholics headed by the Guises to preserve the Catholic religion against the Huguenots and prevent the accession of Henry of Navarre to the throne (see FRANCE: *History*). "The Solemn League and Covenant" was the agreement for the establishment of Presbyterianism in both countries entered into by England and Scotland in 1643 (see COVENANTERS). Of commercial leagues the most famous is that of the Hanse towns, known as the Hanseatic League (*q.v.*). The word has been adopted by political associations, such as the Anti-Corn Law League, the Irish Land League, the Primrose League and the United Irish League, and by numerous social organizations. "League" has also been applied to a special form of competition in athletics, especially in Association football. In this system clubs "league" together in a competition, each playing every other member of the association twice, and the order of merit is decided by the points gained during the season, a win counting two and a draw one.

2. (From the late Lat. *leuga*, or *leuca*, said to be a Gallic word; the mod. Fr. *lieue* comes from the O. Fr. *liue*; the Gaelic *leac*, meaning a flat stone posted as a mark of distance on a

road, has been suggested as the origin), a measure of distance, probably never in regular use in England, and now only in poetical or rhetorical language. It was the Celtic as opposed to the Teutonic unit, and was used in France, Spain, Portugal and Italy. In all the countries it varies with different localities, and the ancient distance has never been fixed. The kilometric league of France is fixed at four kilometres. The nautical league is equal to three nautical miles.

**LEAKE, WILLIAM MARTIN** (1777-1860), British antiquarian and topographer, was born in London on the 14th of January 1777. After completing his education at the Royal Military Academy, Woolwich, and spending four years in the West Indies as lieutenant of marine artillery, he was sent by the government to Constantinople to instruct the Turks in this branch of the service. A journey through Asia Minor in 1800 to join the British fleet at Cyprus inspired him with an interest in antiquarian topography. In 1801, after travelling across the desert with the Turkish army to Egypt, he was, on the expulsion of the French, employed in surveying the valley of the Nile as far as the cataracts; but having sailed with the ship engaged to convey the Elgin marbles from Athens to England, he lost all his maps and observations when the vessel foundered off Cerigo. Shortly after his arrival in England he was sent out to survey the coast of Albania and the Morea, with the view of assisting the Turks against attacks of the French from Italy, and of this he took advantage to form a valuable collection of coins and inscriptions and to explore ancient sites. In 1807, war having broken out between Turkey and England, he was made prisoner at Salonica; but, obtaining his release the same year, he was sent on a diplomatic mission to Ali Pasha of Iannina, whose confidence he completely won, and with whom he remained for more than a year as British representative. In 1810 he was granted a yearly sum of £600 for his services in Turkey. In 1815 he retired from the army, in which he held the rank of colonel, devoting the remainder of his life to topographical and antiquarian studies, the results of which were given to the world in the following volumes: *Topography of Athens* (1821); *Journal of a Tour in Asia Minor* (1824); *Travels in the Morea* (1830), and a supplement, *Peloponnesiaca* (1846); *Travels in Northern Greece* (1835); and *Numismata Hellenica* (1854), followed by a supplement in 1859. A characteristic of the researches of Leake was their comprehensive minuteness, which was greatly aided by his mastery of technical details. His *Topography of Athens*, the first attempt at a scientific treatment of the subject, is still authoritative in regard to many important points (see ATHENS). He died at Brighton on the 6th of January 1860. The marbles collected by him in Greece were presented to the British Museum; his bronzes, vases, gems and coins were purchased by the university of Cambridge after his death, and are now in the Fitzwilliam Museum. He was elected F.R.S. and F.R.G.S., received the honorary D.C.L. at Oxford (1816), and was a member of the Berlin Academy of Sciences and correspondent of the Institute of France.

See *Memoir* by J. H. Marsden (1864); the *Architect* for the 7th of October 1876; E. Curtius in the *Preussische Jahrbücher* (Sept., 1876); J. E. Sandys, *Hist. of Classical Scholarship*, iii. (1908), p. 442.

**LEAMINGTON,** a municipal borough and health resort of Warwickshire, England, on the river Leam near its junction with the Avon, 98 m. N.W. from London, served by the Great Western and London & North Western railways. Pop. (1901) 26,888. The parliamentary boroughs of Leamington and Warwick were joined into one constituency in 1885, returning one member. The centres of the towns are 2 m. apart, Warwick lying to the west, but they are united by the intermediate parish of New Milverton. There are three saline springs, and the principal pump-rooms, baths and pleasant gardens lie on the right bank of the river. The chief public buildings are the town hall (1884), containing a free library and school of art;

and the Theatre Royal and assembly room. The parish church of All Saints is modernized, and the other churches are entirely modern. The S. Warwickshire hospital and Midland Counties Home for incurables are here. Leamington High School is an important school for girls. There is a municipal technical school. Industries include iron foundries and brickworks. The town lies in a well-wooded and picturesque country, within a few miles of such interesting towns as Warwick, Kenilworth, Coventry and Stratford-on-Avon. It is a favourite hunting centre, and, as a health resort, attracts not only visitors but residents. The town is governed by a mayor, 8 aldermen, and 24 councillors. Area, 2817 acres.

Leamington was a village of no importance until about 1786, when baths were first erected, though the springs were noticed by Camden, writing about 1586. The population in 1811 was only 543, The town was incorporated in 1875. The name in former use was Leamington Priors, in distinction from Leamington Hastings, a village on the upper Leam. By royal licence granted in 1838 it was called Royal Leamington Spa.

LÉANDRE, CHARLES LUCIEN (1862- ), French caricaturist and painter, was born at Champsecret (Orne), and studied painting under Bin and Cabanel. From 1887 he figured among the exhibitors of the Salon, where he showed numerous portraits and genre pictures, but his popular fame is due to his comic drawings and caricatures. The series of the "Gotha des souverains," published in *Le Rire*, placed him in the front rank of modern caricaturists. Besides his contributions to *Le Rire*, *Le Figaro* and other comic journals, he published a series of albums: *Nocturnes*, *Le Musée des souverains*, and *Paris et la province*. Léandre produced admirable work in lithography, and designed many memorable posters, such as the "Yvette Guilbert." "Les nouveaux mariés," "Joseph Prudhomme," "Les Lutteurs," and "La Femme au chien." He was created a knight of the Legion of Honour.

LEAP-YEAR (more properly known as *bissextile*), the name given to the year containing 366 days. The astronomers of Julius Caesar, 46 B.C., settled the solar year at 365 days 6 hours. These hours were set aside and at the end of four years made a day which was added to the fourth year. The English name for the bissextile year is an allusion to the result of the interposition of the extra day; for after the 29th of February a date "leaps over" the day of the week on which it would fall in ordinary years. Thus a birthday on the 10th of June, a Monday, will in the next year, if a leap-year, be on the 10th of June, a Wednesday. Of the origin of the custom for women to woo, not be wooed, during leap-year no satisfactory explanation has ever been offered. In 1288 a law was enacted in Scotland that "it is statut and ordaint that during the rein of hir maist blissit Megeste, for ilk yeare knowne as lepe yeare, ilk mayden ladye of bothe highe and lowe estait shall hae liberte to bespeke ye man she likes, albeit he refuses to taik hir to be his lawful wyfe, he shall be mulcted in ye sum ane pundis or less, as his estait may be; except and awis gif he can make it appeare that he is betrothit ane ither woman he then shall be free." A few years later a like law was passed in France, and in the 15th century the custom was legalized in Genoa and Florence.

LEAR, EDWARD (1812-1888), English artist and humorist, was born in London on

the 12th of May 1812. His earliest drawings were ornithological. When he was twenty years old he published a brilliantly coloured selection of the rarer Psittacidae. Its power attracted the attention of the 13th earl of Derby, who employed Lear to draw his Knowsley menagerie. He became a permanent favourite with the Stanley family; and Edward, 15th earl, was the child for whose amusement the first *Book of Nonsense* was composed. From birds Lear turned to landscape, his earlier efforts in which recall the manner of J. D. Harding; but he quickly acquired a more individual style. About 1837 he set up a studio at Rome, where he lived for ten years, with summer tours in Italy and Sicily, and occasional visits to England. During this period he began to publish his *Illustrated Journals of a Landscape Painter*: charmingly written reminiscences of wandering, which ultimately embraced Calabria, the Abruzzi, Albania, Corsica, &c. From 1848-1849 he explored Greece, Constantinople, the Ionian Islands, Lower Egypt, the wildest recesses of Albania, and the desert of Sinai. He returned to London, but the climate did not suit him. In 1854-1855 he wintered on the Nile, and migrated successively to Corfu, Malta and Rome, finally building himself a villa at San Remo. From Corfu Lear visited Mount Athos, Syria, Palestine, and Petra; and when over sixty, by the assistance of Lord Northbrock, then Govenor-General, he saw the cities and scenery of greatest interest within a large area of India. From first to last he was, in whatever circumstances of difficulty or ill-health, an indomitable traveller. Before visiting new lands he studied their geography and literature, and then went straight for the mark; and wherever he went he drew most indefatigably and most accurately. His sketches are not only the basis of more finished works, but an exhaustive record in themselves. Some defect of technique or eyesight occasionally left his larger oil painting, though nobly conceived, crude or deficient in harmony; but his smaller pictures and more elaborate sketches abound in beauty, delicacy, and truth. Lear modestly called himself a topographical artist; but he included in the term the perfect rendering of all characteristic graces of form, colour, and atmosphere. The last task he set himself was to prepare for popular circulation a set of some 200 drawings, illustrating from his travels the scenic touches of Tennyson's poetry; but he did not live to complete the scheme, dying at San Remo on the 30th of January 1888. Until sobered by age, his conversation was brimful of humorous fun. The paradoxical originality and ostentatiously uneducated draughtsmanship of his numerous nonsense books won him a more universal fame than his serious work. He had a true artist's sympathy with art under all forms, and might have become a skilled musician had he not been a painter. Swainson, the naturalist, praised young Lear's great red and yellow macaw as "equalling any figure ever painted by Audubon in grace of design, perspective, and anatomical accuracy." Murchison, examining his sketches, complimented them as rigorously embodying geological truth. Tennyson's lines "To E.L. on his Travels in Greece," mark the poet's genuine admiration of a cognate spirit in classical art. Ruskin placed the *Book of Nonsense* first in the list of a hundred delectable volumes of contemporary literature, a judgment endorsed by English-speaking children all over the world.

See *Letters of Edward Lear to Chichester Fortescue, Lord Carlingford, and Frances, Countess Waldegrave* (1907), edited by Lady Strachey, with an introduction by Henry Strachey.

(F. L.*)

LEASE (derived through the Fr. from the Lat. *laxare*, to loosen), a certain form of tenure, or the contract embodying it, of land, houses, &c.; see LANDLORD AND TENANT.

LEATHER (a word which appears in all Teutonic languages; cf. Ger. *Leder*, Dutch *leer* or *leder*, Swed. *läder*, and in such Celtic forms as Welsh *llader*), an imputrescible substance prepared from the hides or skins of living creatures, both cold and warm blooded, by chemical and mechanical treatment. Skins in the raw and natural moist state are readily

putrescible, and are easily disintegrated by bacterial or chemical action, and if dried in this condition become harsh, horny and intractable. The art of the leather manufacturer is principally directed to overcoming the tendency to putrefaction, securing suppleness in the material, rendering it impervious to and unalterable by water, and increasing the strength of the skin and its power to resist wear and tear.

Leather is made by three processes or with three classes of substances. Thus we have (1) tanned leather, in which the hides and skins are combined with tannin or tannic acid; (2) tawed leather, in which the skins are prepared with mineral salts; (3) chamoised (shamoyed) leather, in which the skins are rendered imputrescible by treatment with oils and fats, the decomposition products of which are the actual tanning agents.

*Sources and Qualities of Hides and Skins.*—The hides used in heavy leather manufacture may be divided into three classes: (1) ox and heifer, (2) cow, (3) bull. Oxen and heifer hides produce the best results, forming a tough, tight, solid leather. Cow hides are thin, the hide itself being fibrous, but still compact, and by reason of its spread or area is used chiefly for dressing purposes in the bag and portmanteau manufacture and work of a similar description. Bull hides are fibrous; they are largely used for heel lifts, and for cheap belting, the thicker hides being used in the iron and steel industry.

***Heavy leathers.***



A second classification now presents itself, viz. the British home supply, continental (Europe), British colonial, South American, East Indian, Chinese, &c.

In the British home supply there are three chief breeds: (1) Shorthorns (Scotch breed), (2) Herefords (Midland breed), (3) Lowland, or Dutch class. From a tanner’s standpoint, the shorthorns are the best hides procurable. The cattle are exposed to a variable climate in the mountainous districts of Scotland, and nature, adapting herself to circumstances, provides them with a thicker and more compact hide; they are well grown, have short necks and small heads. The Hereford class are probably the best English hide; they likewise have small heads and horns, and produce good solid sole leather. The Lowland hides come chiefly from Suffolk, Kent and Surrey; the animals have long legs, long necks and big heads. The hides are usually thin and spready. The hides of the animals killed for the Christmas season are poor. The animals being stall-fed for the beef, the hides become distended, thin and surcharged with fat, which renders them unsuitable for first-class work.

The continental supply may be divided into two classes: (1) Hides from hilly regions, (2) hides from lowlands. All animals subject to strong winds and a wide range of temperatures have a very strong hide, and for this reason those bred in hilly and mountainous districts are best. The hides coming under heading No. 1 are of this class, and include those from the Swiss and Italian Alps, Bavarian Highlands and Pyrenees, also Florence, Oporto and Lisbon hides. They are magnificent hides, thick, tightly-built, and of smooth grain. The butt is long and the legs short. A serious defect in some of these hides is a thick place on the neck caused by the yoke; this part of the hide is absolute waste. Another defect, specially noticeable in Lisbon and Oporto hides, is goad marks on the rump, barbed wire scratches and warbles, caused by the gadfly. Those hides coming under heading No. 2 are Dutch, Rhine valley, Danish, Swedish, Norwegian, Hungarian, &c. The first three hides are very similar; they are spready, poorly grown, and are best used for bag and portmanteau work. Hungarian oxen are immense animals, and supply a very heavy bend. Swedish and Norwegian hides are evenly grown and of good texture; they are well flayed, and used a great deal for manufacturing picker bands, which require an even leather.

New Zealand, Australian and Queensland hides resemble good English. A small quantity of Canadian steers are imported; these are generally branded.

Chinese hides are exported dry, and they have generally suffered more or less from peptonization in the storing and drying; this cannot be detected until they are in the pits, when they fall to pieces.

Anglos are imported as live-stock, and are killed within forty-eight hours. They come to Hull, Birkenhead, Avonmouth and Deptford from various American ports, and usually give a flatter result than English, the general quality depending largely on whether the ship has had a good voyage or not.

Among South American hides, Liebig’s slaughter supply the best; they are thoroughly clean and carefully trimmed and flayed. They come to London, Antwerp and Havre, and except for being branded are of first-class quality. Second to the Liebig slaughter come the Uruguay hides.

East Indian hides are known as kips, and are supposed to be, and should be, the hides of yearling cattle. They are now dressed to a large extent in imitation of box calf, being much cheaper. They come from a small breed of ox, and have an extremely tight grain; the leather is not so soft as calf.

Calf-skins are largely supplied by the continent. They are soft and pliant, and have a characteristically fine grain, are tight in texture and quite apart from any other kind of skin.

***Light leathers.***

The most valuable part of a sheepskin is the wool, and the value of the pelt is inversely as the value of the wool. Pure Leicester and Norfolk wools are very valuable, and next is the North and South Downs, but the skins, *i.e.* the pelts, of these animals are extremely poor. Devon and Cheviot cross-bred sheep supply a fair pelt, and sometimes these sheep are so many times crossed that it is quite impossible to tell what the skin is. Welsh skins also supply a good tough pelt, though small. Indian and Persian sheepskins are very goaty, the herds being allowed to roam about together so much. The sheepskin is the most porous and open-textured skin in existence, as also the most greasy one; it is flabby and soft, with a tight, compact grain, but an extremely loose flesh. Stillborn lambs and lambs not over a month old are worth much more than when they have lived for three months; they are used for the manufacture of best kid gloves, and must be milk skins. Once the lambs have taken to grass the skins supply a harsher leather.

The best goat-skins come from the Saxon and Bavarian Highlands, Swiss Alps, Pyrenees, Turkey, Bosnia, Southern Hungary and the Urals. The goats being exposed to all winds yield fine skins. A good number come from Argentina and from Abyssinia, the Cape and other parts of Africa. Of all light leathers the goat has the toughest and tightest grain; it is, therefore, especially liked for fancy work. The grain is rather too bold for glacé work, for which the sheep is largely used.

The seal-skin, used largely for levant work, is the skin of the yellow-hair seal, found in the Northern seas, the Baltic, Norway and Sweden, &c. The skin has a large, bold, brilliant grain, and being a large skin is much used for upholstery and coach work, like the Cape goat. It is quite distinct from the fur seal.

Porpoise hide is really the hide of the white whale; it is dressed for shooting, fishing and hunting boots. Horse hide is dressed for light split and upper work; being so much stall-fed it supplies only a thin, spready leather. The skins of other Equidae, such as the ass, zebra, quagga, &c. are also dressed to some small extent, but are not important sources.

*Structure of Skin.*—Upon superficial inspection, the hides and skins of all mammalia appear to be unlike each other in general structure, yet, upon closer examination, it is found that the anatomical structure of most skins is so similar that for all practical purposes we may assume that there is no distinction (see SKIN AND EXO-SKELETON). But from the practical point of view, as opposed to the anatomical, there are great and very important differences, such as those of texture, thickness, area, &c.; and these differences cause a great divergence in the methods of tanning used, almost necessitating a distinct tannage for nearly every class of hide or skin.

The skins of the lower animals, such as alligators, lizards, fish and snakes, differ to a large extent from those of the mammalia, chiefly in the epidermis, which is much more horny in structure and forms scales.

The skin is divided into two distinct layers: (1) the epidermis or epithelium, *i.e.* the cuticle, (2) the corium derma, or cutis, *i.e.* the true skin. These two layers are not only different in structure, but are also of entirely distinct origin. The epidermis again divides itself into two parts, viz. the “horny layer” or surface skin, and the *rete Malpighi*, named after the Italian anatomist who first drew attention to its existence. The *rete Malpighi* is composed of living, soft, nucleated cells, which multiply by division, and, as they increase, are gradually pushed to the surface of the skin, becoming flatter and drier as they near it, until they reach the surface as dried scales. The epidermis is thus of cellular structure, and more or less horny or waterproof. It must consequently be removed together with the hair, wool or bristles before tannage begins, but as it is very thin compared with the corium, this matters little.

The hair itself does not enter the corium, but is embedded in a sheath of epidermic structure, which is part of and continuous with the epidermis. It is of cellular structure, and the fibrous part is composed of long needle-shaped cells which contain the pigment with which the hair is coloured. Upon removal of the hair some of these cells remain behind and colour the skin, and this colour does not disappear until these cells are removed by scudding. Each hair is supplied with at least two fat or sebaceous glands, which discharge into the orifice of the hair sheath; these glands impart to the hair that natural glossy appearance which is characteristic of good health. The hair bulb (*b*, fig. 1) consists of living

nucleated cells, which multiply rapidly, and, like the *rete Malpighi*, cause an upward pressure, getting harder at the same time, thereby lengthening the hair.



The hair papilla (*a*, fig. 1) consists of a globule of the corium or true skin embedded in the hair bulb, which by means of blood-vessels feeds and nourishes the hair. Connected with the lower part of each hair is an oblique muscle known as the arrector or erector pili, seen at *k*, fig. 1; this is an involuntary muscle, and is contracted by sudden cold, heat or shock, with an accompanying tightening of the skin, producing the phenomenon commonly known as “goose flesh.” This is the outcome of the contracted muscle pulling on the base of the hair, thereby giving it a tendency to approach the vertical, and producing the simultaneous effect of making the “hair stand on end.”

The sudoriferous or sweat glands (R, fig. 1) consist of long spiral-like capillaries, formed from the fibres of the connective tissue of the corium. These glands discharge sometimes directly through the epidermis, but more often into the orifice of the hair-sheath.

The epidermis is separated from the corium by a very important and very fine membrane, termed the “hyaline” or “glassy layer,” which constitutes the actual grain surface of a hide or skin. This layer is chemically different from the corium, as if it is torn or scratched during the process of tanning the colour of the underlying parts is much lighter than that of the grain surface.

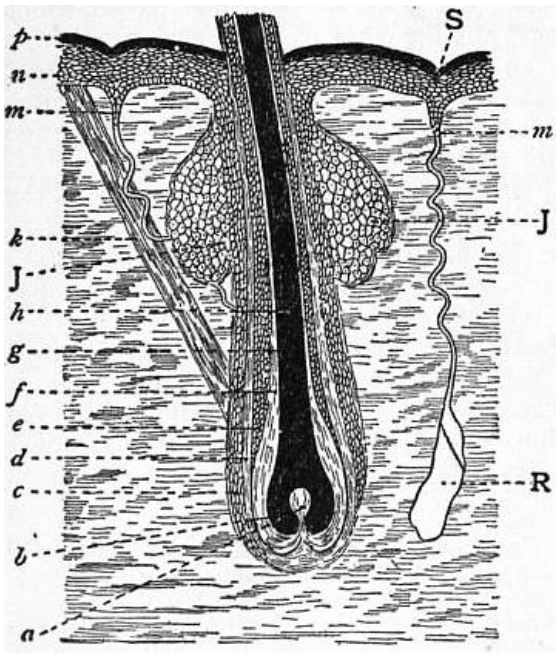



FIG. 1.

*a*, Hair papilla.
*b*, Hair bulb.
*c*, Hair sheath showing epidermic structure.
*d*, Dermic coat of hair sheath.
*e*, Outer root sheath.
*f*, Inner root sheath.
*g*, Hair cuticle.
*h*, Hair.
J, Sebaceous glands.
*k*, Erector pili.
*m*, Sweat ducts.
*n* and *p*, Epidermis.
*n*, Rete Malpighi.
*p*, Horny layer.
R, Sweat or sudoriferous gland.
S, Opening at sweat duct.

The corium, unlike the epidermis, is of fibrous, not cellular structure; moreover, the fibres do not multiply among themselves, but are gradually developed as needed from the interfibrillar substance, a semi-soluble gelatinous modification of the true fibre. This interfibrillar substance consequently has no structure, and is prepared at any time on coming into contact with tannin to form amorphous leather, which fills what would in the absence of this substance be interfibrillar spaces. The more of this matter there is present the more completely will the spaces be filled, and the more waterproof will be the leather. An old bull, as is well known, supplies a very poor, soft and spongy leather, simply because the hide lacks interfibrillar substance, which has been sapped up by the body. The fibres are, therefore, separated by interfibrillar spaces, which on contact with water absorb it with avidity by capillary attraction. But a heifer hide or young calf supplies the most tight and waterproof leather known, because the animals are young, and having plenty of nourishment do not require to draw upon and sap the interfibrillar substance with which the skin is full to overflowing.

The corium obtains its food from the body by means of lymph ducts, with which it is well supplied. It is also provided with nodules of lymph to nourish the hair, and nodules of grease, which increase in number as they near the flesh side, until the net skin, *panniculus adiposus*, or that which separates the corium from meat proper, is quite full with them.

The corium is coarse in the centre of the skin where the fibres, which are of the kind known as white connective tissue, and which exist in bundles bound together with yellow elastic fibres, are loosely woven, but towards the flesh side they become more compact, and as the hyaline layer is neared the bundles of fibres get finer and finer, and are much more tightly interwoven, until finally, next the grain itself, the fibres no longer exist in bundles, but as individual fibrils lying parallel with the grain. This layer is known as the *pars papillaris*. The bundles of fibre interweave one another in every conceivable direction. The fibrils are extremely minute, and are cemented together with a medium rather more soluble than themselves.

There are only two exceptions to this general structure which need be taken into account. Sheep-skin is especially loosely woven in the centre, so much so that any carelessness in the wet work or sweating process enables one to split the skin in two by tearing. This loosely-woven part is full of fatty nodules, and the skin is generally split at this part, the flesh going for chamois leather and the grain for skivers. The other notable exception is the horse hide, which has a third skin over the loins just above the kidneys, known as the crup; it is very greasy and tight in structure, and is used for making a very waterproof leather for seamen’s and fishermen’s boots. Pig-skin, perhaps, is rather peculiar, in the fact that the bristles penetrate almost right through the skin.

*Tanning Materials.*—Tannin or tannic acid is abundantly formed in a very large number of plants, and secreted in such diverse organs and members as the bark, wood, roots, leaves, seed-pods, fruit, &c. The number of tannins which exists has not been determined, nor has the constitution of those which do exist been satisfactorily settled. As used in the tanyard tannin is present both in the free state and combined with colouring matter and accompanied by decomposition products, such as gallic acid or phlobaphenes (anhydrides of the tannins), respectively depending upon the series to which the tannin belongs. In whatever other points they differ, they all have the common property of being powerfully astringent, of forming insoluble compounds with gelatine or gelatinous tissue, of being soluble in water to a greater or lesser extent, and of forming blacks (greenish or bluish) with iron. Pyrogallol tannins give a blue-black coloration or precipitate with ferric salts, and catechol tannins a green-black; and whereas bromine water gives a precipitate with catechol tannins, it does not with pyrogallol tannins. There are two distinctive classes of tannins, viz. catechol and pyrogallol tannins. The materials belonging to the former series are generally much darker in colour than those classified with the latter, and moreover they yield reds, phlobaphenes or tannin anhydrides, which deposit on or in the leather. Pyrogallol tannins include some of the lightest coloured and best materials known, and, speaking generally, the leather produced by them is not so harsh or hard as that produced with catechol tannins. They decompose, yielding ellagic acid (known technically as “bloom”) and gallic acid; the former has waterproofing qualities, because it fills the leather, at the same time giving weight.

It has been stated, and perhaps with some truth, that leather cannot be successfully made with catechol tannins alone; pyrogallol tannins, however, yield an excellent leather; but the finest results are obtained by blending the two.

The classification of the chief tanning materials is as follows:—

| *Pyrogallols.* | *Catechols.* |
|---|---|
| Myrobalans (*Terminalia Chebula*). | Gambier (*Uncaria Gambir*). |
| Chestnut wood (*Castanea vesca*). | Hemlock (*Abies canadensis*). |
| Divi-divi (*Caesalpinia Coriaria*). | Quebracho (*Quebracho Colorado*). |
| Algarobilla (*Caesalpinia brevifolia*). | Mangrove or Cutch (*Rhizophora Mangle*). |
| Sumach (*Rhus Coriaria*). | Mimosa or Golden Wattle (*Acacia Pycnantha*). |
| Oakwood (*Quercus family*). | Larch (*Larix Europaea*). |
| Chestnut oak (*Quercus Prinus*). | Canaigre (*Rumer Hymenosepalum*). |
| Galls (*Quercus Infectoria*). | Birch (*Betula alba*). |
| Willow (*Salix arenaria*). | Cutch Catechu (*Acacia Catechu*). |

*Subsidiary.*

Oakbark (*Quercus Robur*).
Valonia (*Quercus Aegilops*).

Myrobalans are the fruit of an Indian tree. There are several different qualities, the order of which is as follows, the best being placed first: Bhimley, Jubbalpore, Rajpore, Fair Coast Madras and Vingorlas. They are a very light-coloured material, containing from 27 % to 38 % of tannin; they deposit much “bloom,” ferment fairly rapidly, supplying acidity, and yield a mellow leather.

Chestnut comes on the market in the form of crude and decolorized liquid extracts, containing about 27 % to 31 % of tannin, and yields a good leather of a light-brown colour.

Oakwood reaches the market in the same form; it is a very similar material, but only contains 24 % to 27 % of tannin, and yields a slightly heavier and darker leather.

Divi-divi is the dried seed pods of an Indian tree containing 40 % to 45 % of tannin, and yielding a white leather; it might be valuable but for the tendency to dangerous fermentation and development of a dark-red colouring matter.

Algarobilla consists of the seeds of an Indian tree, containing about 45 % of tannin, and in general properties is similar to divi-divi, but does not discolour so much upon fermentation.

Sumach is perhaps the best and most useful material known. It is the ground leaves of a Sicilian plant, containing about 28 % of tannin, and yielding a nearly white and very beautiful leather. It is used alone for tanning the best moroccos and finer leather, and being so valuable is much adulterated, the chief adulterant being *Pistacia lentiscus* (Stinko or Lentisco), an inferior and light-coloured catechol tannin. Other but inferior sumachs are also used. There is Venetian sumach (*Rhus cotinus*) and Spanish sumach (*Colpoon compressa*); these are used to some extent in the countries bordering on the Mediterranean. *R. Glabra* and *R. Copallina* are also used in considerable quantities in America, where they are cultivated.

Galls are abnormal growths found upon oaks, and caused by the gall wasp laying eggs in the plant. They are best harvested just before the insect escapes. They contain from 50 % to 60 % of tannin, and are generally used for the commercial supply of tannic acid, and not for tanning purposes.

Gambier, terra japonica or catechu, is the product of a shrub cultivated in Singapore and the Malay Archipelago. It is made by boiling the shrub and allowing the extract to solidify. It is a peculiar material, and may be completely washed out of a leather tanned with it. It mellows exceedingly, and keeps the leather fibre open; it may be said that it only goes in the leather to prepare and make easy the way for other tannins. Block gambier contains from 35 % to 40 % and cube gambier from 50 % to 65 % of tannin.



Hemlock generally reaches the market as extract, prepared from the bark of the American tree. It contains about 22 % of tannin, has a pine-like odour, but yields a rather dark-coloured red leather.

Quebracho is imported mainly as solid extract, containing 63 % to 70 % of tannin; it is a harsh, light-red tannage, but darkens rapidly on exposure to light. It is used for freshening up very mellow liquors, but is rather wasteful, as it deposits an enormous amount of its tannin as phlobaphenes.

Mangrove or cutch is a solid extract prepared from the mangrove tree found in the swamps of Borneo and the Straits Settlements; it contains upwards of 60 % of a red tannin.

Mimosa is the bark of the Australian golden wattle (*Acacia pycnantha*), and contains from 36 % to 50 % of tannin. It is a rather harsh tannage, yielding a flesh-coloured leather, and is useful for sharpening liquors. This bark is now successfully cultivated in Natal. The tannin content of this Natal bark is somewhat inferior, but the colour is superior to the Australian product.

Larch bark contains 9 % to 10 % of light-coloured tannin, and is used especially for tanning Scotch basils.

Canaigre is the air-dried tuberous roots of a Mexican plant, containing 25 % to 30 % of tannin and about 8 % of starch. It yields an orange-coloured leather of considerable weight and firmness. Its cultivation did not pay well enough, so that it is little used.

Cutch, catechu or “dark catechu,” is obtained from the wood of Indian acacias, and is not to be confounded with mangrove cutch. It contains 60 % of tanning matter and a large proportion of catechin similar to that contained in gambier, but much redder. It is used for dyeing browns and blacks with chrome and iron mordants.

The willow and the white birch barks contain, respectively, 12 % to 14 % and 2 % to 5 % of tannin. In combination they are used to produce the famous Russia leather, whose insect-resisting odour is due to the birch bark. In America this leather is imitated with the

American black birch bark (*Betula lenta*), and also with the oil obtained from its dry distillation.

In the list of materials two have been placed in a subsidiary class because they are a mixture of catechol and pyrogallol tannin. Oak bark produces the best leather known, proving that a blend of the two classes of tannins gives the best results. It is the bark of the coppice oak, and contains 12 % to 14 % of a reddish-yellow tannage. Valonia is the acorn cup of the Turkish and Greek oak. The Smyrna or Turkish valonia is best, and contains 32 % to 36 % of an almost white tannin. Greek valonia is greyer in colour, and contains 26 % to 30 % of tannin. It yields a tough, firm leather of great weight, due to the rapid deposition of a large amount of bloom.

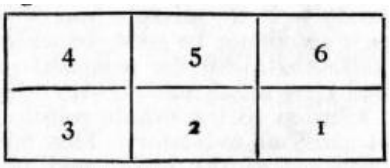
*Grinding and Leaching*[1] *Tanning Materials.*—At first sight it would not seem possible that science could direct such a clumsy process as the grinding of tanning materials, and yet even here, the "scientific smashing" of tanning materials may mean the difference between profit and loss to the tanner. In most materials the tannin exists imprisoned in cells, and is also to some extent free, but with this latter condition the science of grinding has nothing to do. If tanning materials are simply broken by a series of clean cuts, only those cells directly on the surfaces of the cuts will be ready to yield their tannin; therefore, if materials are ground by cutting, a proportion of the total tannin is thrown away. Hence it is necessary to bruise, break and otherwise sever the walls of all the cells containing the tannin; so that the machine wanted is one which crushes, twists and cuts the material at the same time, turning it out of uniform size and with little dust.

The apparatus in most common use is built on the same principle as the coffee mill, which consists of a series of segmental cutters; as the bark works down into the smaller cutters of the mill it is twisted and cut in every direction. This is a very good form of mill, but it requires a considerable amount of power and works slowly. The teeth require constant renewal, and should, therefore, be replaceable in rows, not, as in some forms, cast on the bell. The disintegrator is another form of mill, which produces its effect by violent concussion, obtained by the revolution in opposite directions of from four to six large metal arms fitted with projecting spikes inside a drum, the faces of which are also fitted with protruding pieces of metal. The arms make from 2000 to 4000 revolutions per minute. The chief objection to this apparatus is that it forms much dust, which is caught in silken bags fitted to gratings in the drum. The myrobalans crusher, a very useful machine for such materials as myrobalans and valonia, consists of a pair of toothed rollers above and a pair of fluted rollers beneath. The material is dropped upon the toothed rollers first, where it is broken and crushed; then the crushing is finished and any sharp corners rounded off in the fluted rollers.

It must not be thought that now the material is ground it is necessarily ready for leaching. This may or may not be so, depending upon whether the tanner is making light or heavy leathers. If light leathers are being considered, it is ready for immediate leaching, *i.e.* to be infused with water in preparation of a liquor. If heavy leathers are in process of manufacture, he would be a very wasteful tanner who would extract his material raw. It must be borne in mind that when an infusion is made with fresh tanning material, the liquor begins to deposit decomposition products after standing a day or two, and the object of the heavy-leather tanner is to get this material deposited in the leather, to fill the pores, produce weight and make a firm, tough product. With this end in view he dusts his hides with this fresh material in the layers, *i.e.* he spreads a layer between each hide as it is laid down, so that the strong liquors penetrate and deposit in the hides. When most of this power to deposit has been usefully utilized in the layers, then the material (which is now, perhaps, half spent) is leached. The light-leather maker does not want a hard, firm leather, but a soft and pliable product; hence he leaches his material fresh, and does not trouble as to whether the tannin deposits in the pits or not.

Whether fresh or partially spent material is leached, the process is carried out in the same way. There are several methods in vogue; the best method only will be described, viz. the "press leach" system.

The leaching is carried out in a series of six square pits, each holding about 3 to 4 tons of material. The method depends upon the fact that when a weak liquor is forced over a stronger one they do not mix, by reason of the higher specific gravity of the stronger one; the weaker liquor, therefore, by its weight forces the stronger liquor downwards, and as the pit in which it is contained is fitted with a false bottom and side duct running over into the next pit, the stronger liquor is forced upwards through this duct on to the next stronger pit. There the process is repeated, until finally the weak liquor or water, as the case may be, is run off the last vat as a very strong infusion. As a concrete example let us take the six pits shown in the figure.




No. 6 is the last vat, and the liquor, which is very strong, is about to be run off. No. 1 is spent material, over which all six liquors have passed, the present liquor having been pumped on as fresh water. The liquor from No. 6 is run off into the pump well, and liquor No. 1 is pumped over No. 2, thus forcing all liquors one forward and leaving pit No. 1 empty; this pit is now cast and filled with clean fishings and perhaps a little new material, clean water is then pumped on No. 2, which is now the weakest pit, and all liquors are thus forced forward one pit more, making No. 1 the strongest pit. After infusing for some time this is run off to the pump well, and the process repeated. It may be noted that the hotter the water is pumped on the weakest pit, the better will the material be spent, and the nearer the water is to boiling-point the better; in fact, a well-managed tanyard should have the spent tan down to between 1% and 2% of tannin, although this material is frequently thrown away containing up to 10% and sometimes even more. There is a great saving of time and labour in this method, since the liquors are self-adjusting.

*Testing Tan Liquors.*—The methods by which the tanning value of any substance may be determined are many, but few are at once capable of simple application and minute accuracy. An old method of ascertaining the strength of a tan liquor is by means of a hydrometer standardized against water, and called a barkometer. It consists of a long graduated stem fixed to a hollow bulb, the opposite end of which is weighted. It is placed in the liquor, the weighted end sinks to a certain depth, and the reading is taken on the stem at that point which touches “water mark.” The graduations are such that if the specific gravity is multiplied by 1000 and then 1000 is subtracted from the result, the barkometer strength of the liquor is obtained. Thus 1029 specific gravity equals 29° barkometer. This method affords no indication of the amount of tannin present, but is useful to the man who knows his liquors by frequent analysis.

A factor which governs the quality of the leather quite as much as the tannin itself is the acidity of the liquors. It is known that gallic and tannic acids form insoluble calcium salts, and all the other acids present as acetic, propionic, butyric, lactic, formic, &c., form comparatively soluble salts, so that an easy method of determining this important factor is as follows:—

Take a quantity, say 100 c.c., of tan liquor, filter till clear through paper, then pipette 10 c.c. into a small beaker (about 1½ in. diameter), place it on some printed paper and note how clear the print appears through the liquor; now gradually add from a burette a clear solution of saturated lime water until the liquor becomes just cloudy, that is until it just loses its brilliancy. Now read off the number of cubic centimetres required in the graduated stem of the burette, and either read as degrees (counting each c.c. as one degree), to which practice at once gives a useful signification, or calculate out in terms of acetic acid per 100 c.c. of liquor, reckoning saturated lime water as $\frac{1}{20}$ normal.



The methods which deal with the actual testing for tannin itself depend mostly upon one or other of two processes; either the precipitation of the tannin by means of gelatin, or its absorption by means of prepared hide. Sir Humphry Davy was the first to propose a method for analysing tanning materials, and he precipitated the tannin by means of gelatin in the presence of alum, then dried and weighed the precipitate, after washing free from excess of reagents. This method was improved by Stoddart, but cannot lay claim to much accuracy. Warington and Müller again modified the method, but their procedure being tedious and difficult to work could not be regarded as a great advance. Wagner then proposed precipitation by means of the alkaloids, with special regard to cinchonine sulphate in the presence of rosaniline acetate as indicator, but this method also proved useless. After this many metallic precipitants were tried, used gravimetrically and volumetrically, but without success. The weighing of precipitated tannates will never succeed, because the tannins are such a diverse class of substances that each tannin precipitates different quantities of the precipitants, and some materials contain two or three different tannins. Then there are also the difficulties of incomplete precipitation and the precipitation of colouring matter, &c. Among this class of methods may be mentioned Garland’s, in which tartar emetic and sal ammoniac were employed. It was improved by Richards and Palmer.

Another class of methods depends upon the destruction of the tannin by some oxidizing agent, and the estimation of the amount required. Terreil rendered the tannin alkaline, and after agitating it with a known quantity of air, estimated the volume of oxygen absorbed. The

method was slow and subject to many sources of error. Commaille oxidized with a known quantity of iodic acid and estimated the excess of iodate. This process also was troublesome, besides oxidizing the gallic acid (as do all the oxidation processes), and entailing a separate estimation of them after the removal of the tannin. Ferdinand Jean (1877) titrated alkaline tannin solution with standard iodine, but the mixture was so dark that the end reaction with starch could not be seen; in addition the gallic acid had again to be estimated. Monier proposed permanganate as an oxidizing agent, and Lowenthal made a very valuable improvement by adding indigo solution to the tannin solution, which controlled the oxidation and acted as indicator. This method also required double titration because of the gallic acid present, the tanning matters being removed from solution by means of gelatin and acidified salt.

The indirect gravimetric hide-powder method first took form about 1886. It was published in *Der Gerber* by Simand and Weiss, other workers being Eitner and Meerkatz. Hammer, Muntz and Ramspacher did some earlier work on similar lines, depending upon the specific gravity of solutions. Professor H. R. Procter perfected this method by packing a bell, similar in shape to a bottomless bottle of about 2 oz. (liq.) capacity, with the hide-powder, and siphoning the tan liquor up through the powder and over into a receiver. This deprives the tan liquor of tannin, and a portion of this non-tannin solution is evaporated to dryness and weighed till constant; similarly a portion of the original solution containing non-tannins and tannins is evaporated and weighed till constant; then the weight of the non-tannins subtracted from the weight of the non-tannins and tannins gives the weight of tannin, which is calculated to percentage on original solutions. This method was adopted as official by the International Association of Leather Trades Chemists until September 1906, when its faults were vividly brought before them by Gordon Parker of London and Bennett of Leeds, working in collaboration, although other but not so complete work had been previously done to the same end. The main faults of the method were that the hide-powder absorbed non-tannins, and therefore registered them as tannins, and the hide-powder was partially soluble. This difficulty has now been overcome to a large extent in the present official method of the I.A.L.T.C.

Meanwhile, Parker and Munro Payne proposed a new method of analysis, the essence of which is as follows:—A definite excess of lime solution is added to a definite quantity of tannin solution and the excess of lime estimated; the tan solution is now deprived of tannin by means of a soluble modification of gelatin, called “collin,” and the process is repeated. Thus we get two sets of figures, viz. total absorption and acid absorption (*i.e.* acids other than tan); the latter subtracted from the former gives tannin absorption, and this is calculated out in percentage of original liquor. The method failed theoretically, because a definite molecular weight had to be assumed for tannins which are all different. There are also several other objections, but though, like the hide-powder method, it is quite empirical, it gives exceedingly useful results if the rules for working are strictly adhered to.

The present official method of the I.A.L.T.C. is a modification of the American official method, which is in turn a modification of a method proposed by W. Eitner, of the Vienna Leather Research Station. The hide-powder is very slightly chrome-tanned with a basic solution of chromium chloride, 2 grammes of the latter being used per 100 grammes of hide-powder, and is then washed free from soluble salts and squeezed to contain 70% of moisture, and is ready for use. This preliminary chroming does away with the difficulty of the powder being soluble, by rendering it quite insoluble; it also lessens the tendency to absorb non-tannins. Such a quantity of this wet powder as contains 6.5 grammes of dry hide is now taken, and water is added until this quantity contains exactly 20 grammes of moisture, *i.e.* 26.5 grammes in all; it is then agitated for 15 minutes with 100 c.c. of the prepared tannin solution, which is made up to contain tannin within certain definite limits, in a mechanical rotator, and filtered. Of this non-tannin solution 50 c.c. is then evaporated to dryness. The same thing is done with 50 c.c. of original solution containing non-tannins and tannins, and both residues are weighed. The tannin is thus determined by difference. The method does all that science can do at present. The rules for carrying out the analysis are necessarily very strict. The object in view is that all chemists should get exactly concordant results, and in this the I.A.L.T.C. has succeeded.

The work done by Wood, Trotman, Procter, Parker and others on the alkaloidal precipitation of tannin deserves mention.

*Heavy Leathers.*—The hides of oxen are received in the tanyard in four different conditions: (1) market or slaughter hides, which, coming direct from the local abattoirs, are soft, moist and covered with dirt and blood; (2) wet salted hides; (3) dry salted hides; (4) sun-dried or “flint” hides—the last three forms being the condition in which the imports of foreign hides are made. The first operation in the tannery is to clean the hides and bring them back as nearly as possible to the flaccid condition in which they left the animal’s back.

The blood and other matter on market hides must be removed as quickly as possible, the blood being of itself a cause of dark stains and bad grain, and with the other refuse a source of putrefaction. When the hides are sound they are given perhaps two changes of water.

Salted hides need a longer soaking than market hides, as it is not only essential to remove the salt from the hide, but also necessary to plump and soften the fibre which has been partially dehydrated and contracted by the salt. It must also be borne in mind that a 10 % solution of salt dissolves hide substance, thereby causing an undesirable loss of weight, and a weak solution prevents plumping, especially when taken into the limes, and may also cause "buckling," which cannot easily be removed in after processes. Dried and dry salted hides require a much longer soaking than any other variety. Dried hides are always uncertain, as they may have putrefied before drying, and also may have been dried at too high a temperature; in the former case they fall to pieces in the limes, and in the latter case it is practically impossible to soak them back, unless putrefactive processes are used, and such are always dangerous and difficult to work because of the Rivers Pollution Acts. Prolonged soaking in cold water dissolves a serious amount of hide substance. Soaking in brine may be advantageous, as it prevents putrefaction to some extent. Caustic soda, sodium sulphide and sulphurous acid may also be advantageously employed on account of their softening and antiseptic action. In treating salted goods, the first wash water should always be rapidly changed, because, as mentioned, strong salt solutions dissolve hide; four changes of water should always be given to these goods.

There are other and mechanical means of softening obstinate material, viz. by stocking. The American hide mill, or double-acting stocks, shown diagrammatically in fig. 2, is a popular piece of apparatus, but the goods should never be subjected to violent mechanical treatment until soft enough to stand it, else severe grain cracking may result. Perhaps the use of sodium sulphide or caustic soda in conjunction with the American wash wheel is the safest method.

Whatever means are used the ultimate object is first to swell and open up the fibres as much as possible, and secondly to remove putrefactive refuse and dirt, which if left in is fixed by the lime in the process of depilation, and causes a dirty buff.

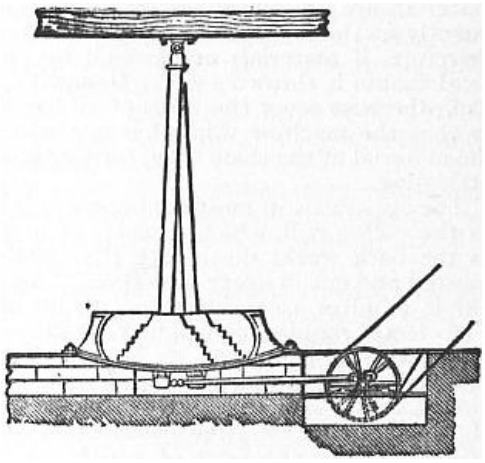


Fig. 2.—Double-acting Stocks.

After being thus brought as nearly as possible into a uniform condition, all hides are treated alike. The first operation to which they are subjected is *depilation*, which removes not only the hair but also the scarf skin or epidermis. When the goods are sent to the limes for depilation they are, first of all, placed in an old lime, highly charged with organic matter and bacteria. It is the common belief that the lime causes the hair to loosen and fall out, but this is not so; in fact, pure lime has the opposite effect of tightening the hair. The real cause of the loosening of the hair is that the bacteria in the old lime creep down the hair, enter the *rete Malpighi* and hair sheath, and attack and decompose the soft cellular structure of the sheath and bulb, also altering the composition of the *rete Malpighi* by means of which the scarf skin adheres to the true skin. These products of the bacterial action are soluble in lime, and immediately dissolve, leaving the scarf skin and hair unbound and in a condition to leave the skin upon scraping. In this first "green" lime the action is mainly this destructive one, but the goods have yet to be made ready to receive the tan liquor, which they must enter in a plump, open and porous condition. Consequently, the "green" lime is followed with two more, the second being less charged with bacteria, and the third being, if not actually a new one, a very near approach to it; in these two limes the bundles of fibre are gradually softened, split up and distended, causing the hide to swell, the interfibrillar substance is rendered soluble and the whole generally made suitable for transference to the tan liquors. The hide itself is only very slightly soluble; if care is taken, the grease is transformed into an insoluble calcium soap, and the hair is hardly acted upon at all.



The time the goods are in the limes and the method of making new limes depends upon the quality of the leather to be turned out. The harder and tougher the leather required the shorter and fresher the liming. For instance, for sole leather where a hard result is required, the time in the limes would be from 8 to 10 days, and a perfectly fresh top lime would be used, with the addition of sodium sulphide to hasten the process. Every tanner uses a different quantity of lime and sulphide, but a good average quantity is 7 lb lime per hide and

10-15 lb sodium sulphide per pit of 100 hides. The lime is slaked with water and the sulphide mixed in during the slaking; if it is added to the pit when the slaking is finished the greater part of its effect is lost, as it does not then enter into the same chemical combinations with the lime, forming polysulphides, as when it is added during the process of slaking.

For softer and more pliable leathers, such as are required for harness and belting, a “lower” or mellower liming is given, and the time in the limes is increased from 9 to 12 days. Some of the old mellow liquor is added to the fresh lime in the making, so as just to take off the sharpness. It would be made up as for sole leather, but with less sulphide or none at all, and then a dozen buckets of an old lime would be added. For lighter leathers from 3 to 6 weeks’ liming is given, and a fresh lime is never used.

“Sweating” as a method of depilation is obsolete in England so far as heavy leathers are concerned. It consists of hanging the goods in a moist warm room until incipient putrefaction sets in. This first attacks the more mucous portions, as the *rete Malpighi*, hair bulb and sheath, and so allows the hair to be removed as before. The method pulls down the hide, and the putrefaction may go too far, with disastrous results, but there is much to recommend it for sheepskins where the wool is the main consideration, the main point being that while lime entirely destroys wool, this process leaves it intact, only loosening the roots. It is consequently still much used.

Another method of fellmongering (dewooling) sheepskins is to paint the flesh side with a cream of lime made with a 10% solution of sodium sulphide and lay the goods in pile flesh to flesh, taking care that none of the solution comes in contact with the wool, which is ready for pulling in from 4 to 8 hours. Although this process may be used for any kind of skin, it is practically only used for sheep, as if any other skin is depilated in this manner all plumping effect is lost. Since this must be obtained in some way, it is an economy of time and material to place the goods in lime in the first instance.

Sometimes, in the commoner classes of sole leather, the hair is removed by painting the hair side with cream of lime and sulphide, or the same effect is produced by drawing the hides through a strong solution of sulphide; this completely destroys the hair, actually taking it into solution. But the hair roots remain embedded in the skin, and for this reason such leather always shows a dirty buff.

Arsenic sulphide (realgar) is slaked with the lime for the production of the finer light leathers, such as glace kid and glove kid. This method produces a very smooth grain (the tendency of sodium sulphide being to make the grain harsh and bold), and is therefore very suitable for the purpose, but it is very expensive.

Sufficient proof of the fact that it is not the lime which causes skins to unhair is found in the process of chemical liming patented by Payne and Pullman. In this process the goods are first treated with caustic soda and then with calcium chloride; in this manner lime is formed in the skin by the reaction of the two salts, but still the hair remains as tight as ever. If this process is to be used for unhairing and liming effect, the goods must be first subjected to a putrid soak to loosen the hair, and afterwards limed. Experiments made by the present writer also prove this theory. A piece of calf skin was subjected to sterilized lime for several months, at the end of which time the hair was as tight as ever; then bacterial influence was introduced, and the skin unhaired in as many days.

After liming it is necessary to unhair the goods. This is done by stretching a hide over a tanner’s beam (fig. 3), when with an unhairing knife (a, fig. 4) the beamsman partially scrapes and partially shaves off the hair and epidermis. Another workman, a “flesher,” removes the flesh or “net skin” (*panniculus adiposus*), a fatty matter from the flesh side of the skin, with the fleshing knife (two-edged), seen in *b*, fig. 4. For these operations several machines have been adapted, working mostly with revolving spiral blades or vibrating cutters, under which the hides pass in a fully extended state. Among these may be mentioned the Leidgen unhairer, which works on a rubber bed, which “gives” with the irregularities of the hide, and the Wilson flesher, consisting of a series of knives attached to a revolving belt,

FIG. 3.—Tanner’s Beam.

and which also “give” in contact with irregularities.

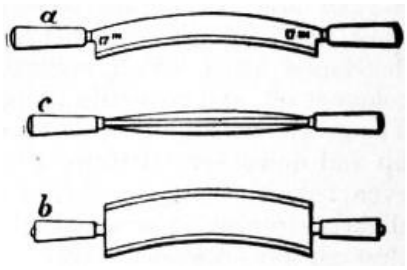


Fig. 4.—Tanner’s Knives and Pin.

At this stage the hide is divided into several parts, the process being known as “rounding.” The object of the division is this: certain parts of the hide termed the “offal” are of less value than the “butt,” which consists of the prime part. The grain of the butt is fine and close in texture, whereas the offal grain is loose, coarse and open, and if the offal is placed in the same superior liquors as the butt, being open and porous, it will absorb the best of the tannin first; consequently the offal goes to a set of inferior liquors, often consisting of those through which the butts have passed. The hides are “rounded” with a sharp curved butcher’s knife; the divisions are seen in fig. 5. The bellies, cheeks and shoulders constitute the offal, and are tanned separately although the shoulder is not often detached from the butt until the end of the “suspenders,” being of slightly better quality than the bellies. The butt is divided into two “bends.” This separation is not made until the tanning of the butt is finished, when it is cut in two, and the components sold as “bends,” although as often as not the butt is not divided. In America the hides are only split down the ridge of the back, from head to tail, and tanned as hides. Dressing hides are more frequently rounded after tanning, the mode depending on the purpose for which the leather is required.

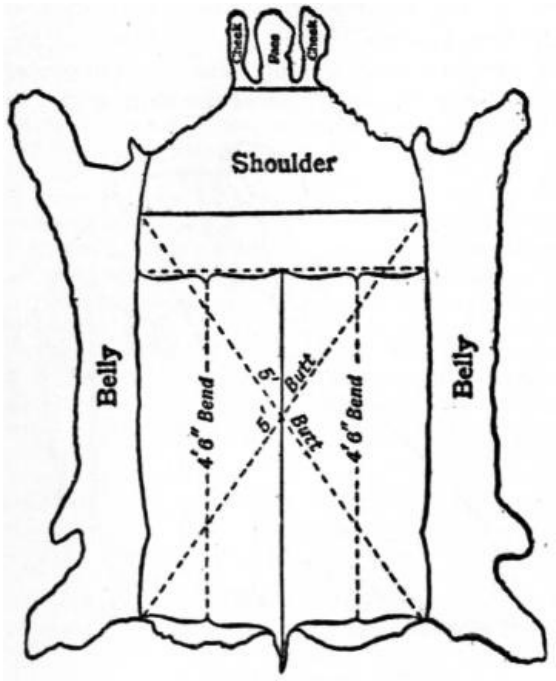


Fig. 5.

The next step is to remove as much “scud” and lime as possible, the degree of removal of the latter depending upon the kind of leather to be turned out. “Scudding” consists of working the already unhaired hide over the beam with an unhairing knife with increased pressure, squeezing out the dirt, which is composed of pigment cells, semi-soluble compounds of lime, and hide, hair sacks and soluble hide substance, &c. This exudes as a dirty, milky, viscid liquid, and mechanically brings the lime out with it, but involves a great and undesirable loss of hide substance, heavy leather being sold by weight. This difficulty is now got over by giving the goods an acid bath first, to delime the surface; the acid fixes this soluble hide substance (which is only soluble in alkalies) and hardens it, thus preventing its loss, and the goods may then be scudded clean with safety. The surface of all heavy leathers must be delimed to obtain a good coloured leather, the demand of the present day boot manufacturer; it is also necessary to carry this further with milder leathers than sole, such as harness and belly, &c., as excess of lime causes the leather to crack when finished. Perhaps the best material for this purpose is boracic acid, using about 10 lb per 100 butts, and suspending the goods. This acid yields a characteristic fine grain, and because of its limited solubility cannot be used in excess. Other acids are also used, such as acetic, lactic, formic, hydrochloric, with varying success. Where the water used is very soft, it is only necessary to wash in water for a few hours, when the butts are ready for tanning, but if the water is hard, the lime is fixed in the hide by the bicarbonates it contains, in the form of carbonate, and the result is somewhat disastrous.



After deliming, the butts are scudded, rinsed through water or weak acid, and go off to the tan pits for tanning proper. Any lime which remains is sufficiently removed by the acidity of the early tan liquors.

The actual tanning now begins, and the operations involved may be divided into a series of three: (1) colouring, (2) handling, (3) laying away.

The colouring pits or “suspenders,” perhaps a series of eight pits, consist of liquors ranging from 16° to 40° barkometer, which were once the strongest liquors in the yard, but have gradually worked down, having had some hundreds of hides through them; they now

contain very little tannin, and consist mainly of developed acids which neutralize the lime, plump the hide, colour it off, and generally prepare it to receive stronger liquors. The goods are suspended in these pits on poles, which are lifted up and down several times a day to ensure the goods taking an even colour; they are moved one pit forward each day into slightly stronger liquors, and take about from 7 to 18 days to get through the suspender stage.

The reason why the goods are suspended at this stage instead of being laid flat is that if the latter course were adopted, the hides would sink and touch one another, and the touch-marks, not being accessible to the tan liquor, would not colour, and uneven colouring would thus result; in addition the weight of the top hides would flatten the lower ones and prevent their plumping, and this condition would be exceedingly difficult to remedy in the after liquors. Another question which might occur to the non-technical reader is, why should not the process be hastened by placing the goods in strong liquors? The reason is simple. Strong tanning solutions have the effect of "drawing the grain" of pelt, *i.e.* contracting the fibres, and causing the leather to assume a very wrinkled appearance which cannot afterwards be remedied; at the same time "case tanning" results, *i.e.* the outside only gets tanned, leaving the centre still raw hide, and once the outside is case-hardened it is impossible for the liquor to penetrate and finish the tanning. This condition being almost irremediable, the leather would thus be rendered useless.

FIG. 6.—Tanner's Hook (without handle).

After the "suspenders" the goods are transferred to a series of "handlers" or "floaters," consisting of, perhaps, a dozen pits containing liquors ranging from 30° to 55° barkometer. These liquors contain an appreciable quantity of both tannin and acid, once formed the "lay-aways," and are destined to constitute the "suspenders." In these pits the goods, having been evenly coloured off, are laid flat, handled every day in the "hinder" (weaker) liquors and shifted forward, perhaps every two days, at the tanner's convenience. The "handling" consists of lifting the butts out of the pit by means of a tanner's hook (fig. 6), piling them on the side of the pit to drain, and returning them to the pit, the top butt in the one handler being returned as the bottom in the next. This operation is continued throughout the process, only, as the hides advance, the necessity for frequent handling decreases. The top two handler pits are sometimes converted into "dusters," *i.e.* when the hides have advanced to these pits, as each butt is lowered, a small quantity of tanning material is sprinkled on it.

Some tanners, now that the hides are set flat, put them in suspension again before laying away; the method has its advantages, but is not general. The goods are generally laid away immediately. The layer liquors consist of leached liquors from the fishings, strengthened with either chestnut or oakwood extract, or a mixture of the two. The first layer is made up to, say, 60° barkometer in this way, and as the hides are laid down they are sprinkled with fresh tanning material, and remain undisturbed for about one week. The second layer is a 70° barkometer liquor, the hides are again sprinkled and allowed to lie for perhaps two weeks. The third may be 80° barkometer and the fourth 90°, the goods being "dusted" as before, and lying undisturbed for perhaps three or four weeks respectively. Some tanners give more layers, and some give less, some more or less time, or greater or lesser strengths of liquor, but this tannage is a typical modern one.

As regards "dusting" material, for mellow leather, mellow materials are required, such as myrobalans being the mellowest and mimosa bark the most astringent of those used in this connexion. For harder leather, as sole leather, a much smaller quantity of myrobalans is used, if any at all, a fair quantity of mimosa bark as a medium, and much valonia, which deposits a large amount of bloom, and is of great astringency. About 3 to 4 cwt. of a judicious mixture is used for each pit, the mellower material predominating in the earlier liquors and the most astringent in the later liquors.

The tanning is now finished, and the goods are handled out of the pits, brushed free from dusting material, washed up in weak liquor, piled and allowed to drip for 2 or 3 days so that the tan may become set.

*Finishing.*—From this stage the treatment of sole leather differs from that of harness, belting and mellower leathers. As regards the first, it will be found on looking at the dripping pile of leather that each butt is covered with a fawn-coloured deposit, known technically as "bloom"; this disguises the under colour of the leather, just like a coat of paint. The theory of the formation of this bloom is this. Strong solutions of tannin, such as are formed between the hides from dusting materials, are not able to exist for long without decomposition, and consequently the tannin begins to condense, and forms other acids and insoluble anhydrides; this insoluble matter separates in and on the leather, giving weight,

firmness, and rendering the leather waterproof. It is known technically as bloom and chemically as ellagic acid.

> After dripping, the goods are scoured free from surface bloom in a Wilson scouring machine, and are then ready for bleaching. There are several methods by which this is effected, or, more correctly several materials or mixtures are used, the method of application being the same, viz. the goods are “vatted” (steeped) for some hours in the bleaching mixture at a temperature of 110° F. The mixture may consist of either sumach and a light-coloured chestnut extract made to 110° barkometer, and 110° F., or some bleaching extract made for the purpose, consisting of bisulphited liquid quebracho, which bleaches by reason of the free sulphurous acid it contains. The former method is best (though more expensive), as it removes less weight, and the light shade of colour is more permanent than that obtained by using bisulphited extracts.
>
> After the first vatting the goods are laid up in pile to drip; meanwhile the liquor is again heated, and they are then returned for another twenty-four hours, again removed and allowed to drip for 2 to 3 days, after which they are oiled with cod oil on the grain and hung up in the sheds to dry in the dark. When they have dried to an india-rubber-like condition, they are piled and allowed to heat slightly until a greyish “bloom” rises to the surface, they are then set out and stretched in a Wilson scouring machine; using brass slickers instead of the stone ones used for scouring, “pinned” over by hand (with the three-edged instrument seen in c, fig. 4, and known as a “pin”) to remove any bloom not removed by the machine, oiled and dried. When of a damp even colour they are “rolled on” between two heavy rollers like a wringing machine, the pressure being applied from above, hung up in the dark sheds again until the uneven colour so produced has dried in, and then “rolled off” through the same machine, the pressure being applied from below. They are now dried right out, brushed on the grain to produce a slight gloss, and are finished.



As regards the finishing of harness leather, &c., the goods, after thorough dripping for a day or two, are brushed, lightly scoured, washed up in hot sumach and extract to improve the colour, and are again laid up in pile for two days; they are then given a good coat of cod oil, sent to the sheds, and dried right out. Only sufficient scouring is given to clean the goods, the object of the tanner being to leave as much weight in as possible, although all this superfluous tan has to be washed out by the currier before he can proceed.

*Currying.*—When the goods are dried from the sheds they are purchased by the currier. If, as is often the case, the tanner is his own currier, he does not tan the goods so heavily, or trouble about adding superfluous weight, but otherwise the after processes, the art of the currier, are the same.

Currying consists of working oil and grease into the leather to render it pliable and increase its strength. It was once thought that this was a mere physical effect produced by the oil, but such is not the case. Currying with animal oils is a second tannage in itself; the oils oxidize in the fibres and produce aldehydes, which are well-known tanning agents; and this double tannage renders the leather very strong. Then there is the lubricating effect, a very important physical action so far as the strength of the leather is concerned. Mineral oils are much used, but they do not oxidize to aldehydes, or, for the matter of that, to anything else, as they are not subject to decomposition. They, therefore, produce no second tannage, and their action is merely the physical one of lubrication, and this is only more or less temporary, as, except in the case of the heavier greases, they slowly evaporate. Where animal fats and oils are used, the longer the goods are left in contact with the grease the better and stronger will be the leather.

In the “Einbrennen” process (German for “burning in”), the hides are thoroughly scoured, and when dry are dipped into hot grease, which is then allowed to cool; when it is nearly set the goods are removed and set out. This process is not much used in Great Britain.

In hand-stuffing belting butts the goods are first thoroughly soaked in water to which has been added some soda, and then scoured and stretched by machine. They are then lightly shaved, to take off the loose flesh and thin the neck. The whole of the mechanically deposited tannin is removed by scouring, to make room for the grease, and they are then put into a sumach vat of 40° barkometer to brighten the colour, horsed up to drip, and set out. If any loading, to produce fictitious weight, is to be done, it is done now, by brushing the solution of either epsom salts, barium chloride or glucose, or a mixture, into the flesh, and laying away in pile for some days to allow of absorption, when, perhaps, another coat is given. Whether this is done or not, the goods are hung up until “tempered” (denoting a certain degree of dryness), and then treated with dubbin. This is manufactured by melting down tallow in a steam-jacketed pan, and adding cod oil, the mixture being stirred continually; when quite clear, it is cooled as rapidly as possible by running cold water

through the steam pan, the stirring being continued until it has set. The tempered leather having been set out on a glass table, to which the flesh side adheres, is given a thin coat of the dubbin on the grain, turned, set out on the flesh, and given a thick coat of dubbin. Then it is hung up in a wind shed, and as the moisture dries out the grease goes in. After two or three days the goods are “set out in grease” with a brass slicker, given a coat of dubbin on the grain slightly thicker than the first coat, then flesh dubbined, a slightly thinner coat being applied than at first, and stoved at 70° F. The grease which is slicked off when “setting out in grease” is collected and sold. After hanging in the warm stove for 2 or 3 days the butts are laid away in grease for a month; they are then slicked out tight, flesh and grain, and buck tallowed. Hard tallow is first rubbed on the grain, when a slight polish is induced by rubbing with the smoothed rounded edge of a thick slab of glass; they are then hung up in the stove or stretched in frames to dry. A great deal of stuffing is now carried out by drumming the goods in hot hard fats in previously heated drums; and in modern times the tedious process of laying away in grease for a month is either left undone altogether or very considerably shortened.

In the tanning and dressing of the commoner varieties of kips and dried hides, the materials used are of a poorer quality, and the time taken for all processes is cut down, so that whereas the time taken to dress the better class of leather is from 7 to 10 months, and in a few cases more, these cheaper goods are turned out in from 3½ to 5 months.

A considerable quantity of the leather which reaches England, such as East India tanned kips, Australian sides, &c., is bought up and retanned, being sold then as a much better-class leather. The first operation with such goods is to “strip” them of any grease they may contain, and part of their original tannage. This is effectually carried out by first soaking them thoroughly, laying them up to drip, and drumming for half an hour in a weak solution of soda; they are then washed by drumming in plenty of water, the water is run off and replaced by very weak sulphuric acid to neutralize any remaining soda; this is in turn run off and replaced by weak tan liquor, and the goods are so tanned by drumming for some days in a liquor of gradually increasing strength. The liquor is made up as cheaply as possible with plenty of solid quebracho and other cheap extract, which is dried in with, perhaps, glucose, epsom salts, &c. to produce weight. Sometimes a better tannage is given to goods of fair quality, in which they are, perhaps, started in the drum and finished in layers, slightly better materials being used all through, and a longer time taken to complete the tannage.

The tannage of dressing hides for bag and portmanteau work is rather different from the other varieties described, in that the goods, after having had a rather longer liming, are “bated” or “puered.”

> Bating consists of placing the goods in a wheel or paddle with hen or pigeon excrement, and paddling for from a few hours to 2 or 3 days. In puering, dog manure is used, and this being rather more active, the process does not take so long. This bating or puering is carried out in warm liquors, and the actions involved are several. From a practical point of view the action is the removal of the lime and the solution of the hair sacs and a certain amount of interfibrillar substance. In this way the goods are pulled down to a soft flaccid condition, which allows of the removal of short hair, hair sacs and other filth by scudding with an unhairing knife upon the beam. The lime is partially taken into solution and partially removed mechanically during the scudding. A large quantity of hide substance, semi-soluble and soluble, is lost by being pressed out, but this matters little, as for dressing work, area, and not weight, is the main consideration. Theoretically the action is due to bacteria and bacterial products (organized ferments and enzymes), unorganized ferments or vegetable ferments like the yeast ferment, such as pancreadine, pepsin, &c. and chemicals, such as ammonium and calcium salts and phosphates, all of which are present in the manure. The evolved gases also play their part in the action.
>
> There are several bates upon the market as substitutes for dung bate. A most popular one was the American “Tiffany” bate, made by keeping a weak glue solution warm for some hours and then introducing a piece of blue cheese to start fermentation; when fermenting, glucose was added, and the bate was then ready for work. This and all other bates have been more or less supplanted by “erodin,” discovered after years of research by Mr Wood (Nottingham) and Drs Popp and Becker (Vienna). This is an artificial bate, containing the main constituents of the dung bate. It is supplied in the form of a bag of nutrient material for bacteria to thrive on and a bottle of bacterial culture. The nutrient material is dissolved in water and the bacterial culture added, and after allowing the mixture to get working it is ready for use. Many tons of this bate are now being used per annum. Its advantages are: (1) that it is clean, (2) that it is under perfect control, and (3) that stains and bate burns, which so often accompany the dung bate, are absolutely absent. Bate burns are caused by not filtering the dung bate through coarse sacking before use. The accumulation of useless solid

matter settles on the skins if they are not kept well in motion, causing excessive action in these places.

After pulling down the goods to a soft, silky condition by bating or puering, it is necessary, after scudding, to plump them up again and bring them into a clean and fit condition for receiving the tan. This is done by “drenching” in a bran drench. A quantity of bran is scalded and allowed to ferment. When the fermentation has reached the proper stage the goods are placed, together with the bran liquor, in a suitable pit or vat, and are allowed to remain until they have risen three times; this rising to the surface is caused by the gaseous products of the fermentation being caught by the skin. The plumping action of the bran is due to the acids produced during fermentation and also in part to the gases, and the cleansing action is due to the mechanical action of the particles of bran rubbing against the grain of the skins. After drenching, the goods are washed free from bran, and are ready for the tanning process.

Drenching, now that all kinds of acids are available, is not so much used for heavy hides as for light skins, it being found much more convenient and cheaper to use acids. In fact, bating and puering are being gradually replaced by acid baths in the case of heavy leathers, the process being carried out as deliming for sole leather, only much more thoroughly in the case of dressing leather.

The tanning of dressing hides, which are not rounded into butts and offal, is briefly as follows. They first enter a series of colouring pits or suspenders, and then a series of handlers, by which time they should be plump and coloured through; in this condition they are split either by means of a union or band-knife splitting machine (fig. 7).

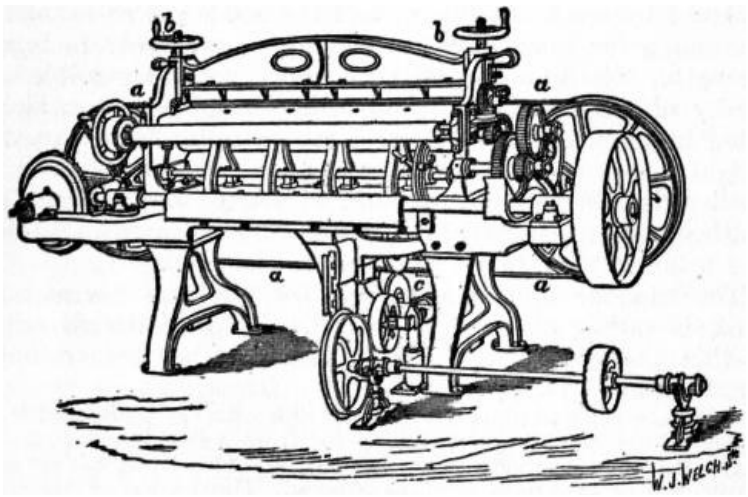



Fig. 7.—Band Knife Splitting Machine.

This latter is the most popular machine, and consists essentially of an endless band knife *a*, which revolves at considerable speed with its cutting edges close to the sides of a pair of rollers through which the leather is fed and pressed against the knife. The lower of these rollers is made of short segments or rings, each separately capable of yielding so as to accommodate itself to the unequal thicknesses of various parts of a hide. The thickness of the leather to be cut is gauged to the utmost minuteness by means of the hand screws *b b* which raise or lower the upper roller. The knife edge of the cutter is kept keen by rubbing against revolving emery wheels *c* as it passes round. So delicately can this machine effect its work that slices of leather uniform throughout and as thin as paper can be easily prepared by it, and by its aid it is quite common to split hides into as many as three useful splits.

The dressing hides are usually split in two. Here we will leave the split (flesh) for a time and continue with the treatment of the grain. After splitting, they enter another series of handlers, are then piled up for a day or two, and thrown into a large drum with sumach mixed to a paste with hot water and a light-coloured extract. They are drummed in this for one hour to brighten and mellow the grain, washed up in tepid liquor, piled for two days, and drummed with cod oil or some other suitable oil or mixture; they are now piled for a day or two to absorb, dried out, flattened on the grain, and flesh folded.

The splits are rinsed up in old sumach liquor and drummed with cheap extracts and adulterants, such as size, glucose, barium chloride, epsom salts, &c. after which they are piled up to drain, dried to a “sammied” condition, rolled to make firm, and dried right out.

In the dressing hide tannage very mellow materials are used. Gambier and myrobalans form the main body of the tannage, together with a little quebracho extract, mimosa bark,

sumach and extracts.

*Upper Leather.*—Under the head of upper leather are included the thin, soft and pliable leathers, which find their principal, but by no means exclusive, application in making the uppers of boots and shoes, which may be taken as a type of a class of leathers. They are made from such skins as East Indian kips, light cow and horse hides, thin split hides, such as those described under dressing leather, but split rather thinner, and calf. The preparatory dressing of such skins and the tanning operations do not differ essentially from those already described. In proportion to the thinness of the skin treated, the processes are more rapidly finished and less complex, the tannage is a little lighter, heavy materials such as valonia being used sparsely if at all. Generally speaking, the goods have a longer and mellower liming and bating, the lime being more thoroughly removed than for the leathers previously described, to produce greater pliability, and everything must tend in this direction. The heavier hides and kips are split as described under dressing leather, and then tanned right out.

*Currying of the Lighter Leathers.*—The duty of the currier is not solely directed towards heavier leathers; he is also entrusted with the dressing and fitting of the lighter leathers for the shoemaker, coachbuilder, saddler, &c. He has to pare the leather down and reduce inequalities in thickness, to impregnate it with fatty matter in order to render it soft and pliable, and to give it such a surface dressing, colour and finish as will please the eye and suit the purposes of its consumers. The fact that machinery is used by some curriers for nearly every mechanical operation, while others adhere to the manual system, renders it almost impossible to give in brief an outline of operations which will be consistent with any considerable number of curriers.

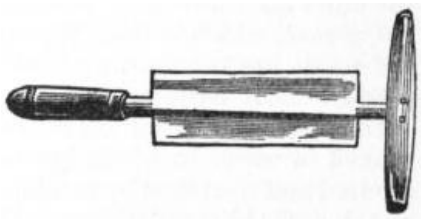


FIG 8.—Currying Knife.

The following may be taken as a typical modern dressing of waxed calf or waxed kips. The goods are first of all soaked down and brought to a “sammied” condition for shaving. In the better-class leathers hand-shaving is still adhered to, as it is maintained that the drag of the shaving machine on the leather causes the “nap” finish to be coarser. Hand-shaving is carried out on a beam or strong frame of wood, supporting a stout plank faced with lignum vitae, and set vertically, or nearly so. The knife (fig. 8) is a double-edged rectangular blade about 12 in. by 5 in., girded on either side along its whole length and down the centre with two bars 3 in. wide, leaving each blade protruding 1 in. beyond them; it has a straight handle at one end and a cross handle at the other in the plane of the blade. The edges of this knife are first made very keen, and are then turned over so as to form a wire edge, by means of the thicker of the two straight steel tools shown in fig. 9. The wire edge is preserved by drawing the thinner of the two steel tools along the interior angle of the wire edge and then along the outside of the turnover edge. The skin being thrown flesh uppermost over the vertical beam, the shaver presses his body against it, and leaning over the top holds the knife by its two handles almost at right angles to the leather, and proceeds to shave it by a scraping stroke downwards which the wire edge, being set at right angles to the knife and almost parallel with the skin, turns into a cut. The skin is shifted so as to bring all parts under the action of the knife, the shaver frequently passing a fold between his finger to test the progress of his work. After shaving, the goods are thoroughly soaked, allowed to drip, and are ready for “scouring.” This operation has for its object the removal of bloom (ellagic acid) and any other superfluous adherent matter. The scouring solution consists of a weak solution of soft soap and borax. This is first well brushed into the flesh of the leather, which is then “sleeked” (slicked) out with a steel slicker shown at S fig. 9. The upper part of the “slicker” is wooden, and into it a steel, stone, brass or vulcanite blade is forced and fastened. The wooden part is grasped in both hands, and the blade is half rubbed and half scraped over the surface of the leather in successive strokes, the angle of the slicker being a continuation of the angle which the thrust out arms of the worker form with the body, perhaps 30° to 45°, with the leather, depending upon the pressure to be applied. The soap and borax solution is continually dashed on the leather to supply a body for the removal of the bloom with the steel slicker. The hide is now turned, and the grain is scoured with a stone slicker and brush, with soap and borax solution, it is then rinsed up, and sent to dry; when sammied, it is “set” *i.e.* the grain is laid smooth with a brass or steel slicker and dried right out. It is now ready for “stuffing,” which is invariably done in the drum with a mixture of stearine and “sod” oil, to which is sometimes added cod oil and wool fat; it is then set out on the grain and “canked” on the flesh, the grain side is glassed, and the leather dried right out. The goods are now “rounded,” *i.e.* the lighter coloured parts of the grain are damped with a mixture of dubbin and water to bring them to even colour, and are then laid in pile for a few days to mellow, when they are ready for

whitening. The goods are damped down and got to the right temper with a weak soap and water solution, and are then “whitened,” an operation similar to shaving, carried out with a turned edge slicker. By this means a fine flesh surface is obtained upon which to finish by waxing; after this they are “boarded” with an arm board (R, fig. 9) to bring up the grain, or give a granular appearance to the leather and make it supple, when they may be turned flesh inwards and bruised, a similar operation to graining, essentially to soften and make them pliant. At this stage the goods are known as “finished russet,” and are stored until ready for waxing.

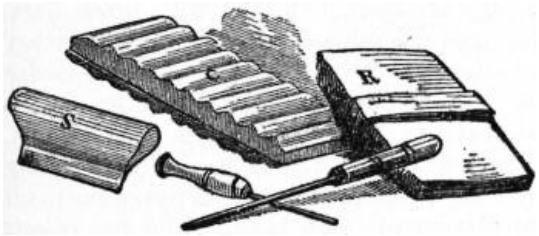


FIG 9.—Currying Apparatus. C, pommel; R, raising board; S, slicker.

For waxing, the first operation is to black the goods. In England this is generally done by hand, but machinery is much more used in the United States. The process consists of well brushing into the flesh side of the skins a black preparation made in one of two ways. The older recipe is a mixture of lampblack, oil and perhaps a little tallow; the newer recipe consists of soap, lampblack, logwood extract and water. Either of these is brushed well into the flesh side, which is then glassed up by means of a thick slab of glass, the smooth rounded edges being used with a slicking motion, and the goods are hung up to dry. When dry they are oiled with cod oil, and are ready for sizing. Goods blacked with soap blacking are sized once, those prepared with oil blacking are sized twice. The size used for soap black skins may consist of a mixture of beeswax, pitch, linseed oil, tallow, soap, glue and logwood extract. For oil blacked skins the “bottom sizing” may be glue, soap, logwood extract and water, after the application of which the goods are dried and the “top sizing” applied; this consists of glue, cod oil, beeswax, tallow, venice turps, black dye and water. The sizings having been applied with a sponge or soft brush, thoroughly rubbed in with a glass slicker, crush marks are removed by padding with a soft leather pad, and the goods, after being dried out, are ready for the market.

In the dressing of waxed grain leathers, such as French calf, satin leather, &c., the preparatory processes are much the same as for waxed leathers described above as far as stuffing, after which the grain is prepared to take the colour by light hand scouring with weak soap and borax solution. The dye is now applied, and so that it may take well on the grain of the greasy leather, a quantity of either soap, turkey red oil or methylated spirit is added to the solution. Acid colours are preferably used, and three coats are given to the dry leather, which is then grained with an arm board, and finished by the application of hard buck tallow to the grain and brushing. The dye or stain may consist of aniline colours for coloured leathers, or, in the case of blacks, consecutive applications of logwood and iron solutions are given.

*Finishing dressing Hides for Bag and Portmanteau Work.*—The hides as received from the tanner are soaked down, piled to sammy, and shaved, generally by machine, after which they are scoured, as under waxed leather, sumached and hung up to dry; when just damp they are set out with a brass slicker and dried right out. The grain is now filled by applying a solution of either Irish moss, linseed mucilage or any other mucilaginous filling material, and the flesh is sized with a mixture of mucilage and French chalk, after which the goods are brush-stained with an aniline dye, to which has been added linseed mucilage to give it body; two coats are applied to the sammied leather. When the goods have sammied, after the last coat of stain, they are “printed” with a brass roller in a “jigger,” or by means of a machine embosser. This process consists of imprinting the grain by pressure from a brass roller, on which the pattern is deeply etched. After printing, the flesh side is sponged with a weak milk solution, lightly glassed and dried, when the grain is sponged with weak linseed mucilage, almost dried, and brushed by machine. The hides are now finished, by the application either of pure buck tallow or of a mixture of carnauba wax and soap; this is rubbed up into a slight gloss with a flannel.

*Light Leathers.*—So far only the heavier leathers have been dealt with; we will now proceed to discuss lighter calf, goat, sheep, seal, &c.

In tanning light leathers everything must tend towards suppleness and pliability in the finished leather, in contrast to the firmness and solidity required in heavy leathers. Consequently, the liming is longer and mellower; puering, bating or some bacterial substitute always follows; the tannage is much shorter; and mellow materials are used. A deposition of bloom in the goods is not often required, so that very soon after they are struck through they are removed as tanned. The materials largely used are sumach, oak bark,

gambier, myrobalans, mimosa bark, willow, birch and larch barks.

As with heavy leathers, so also with light leathers, there are various ways of tanning; and quality has much to do with the elaboration or modification of the methods employed. The tanning of all leathers will be dealt with first, dyeing and finishing operations being treated later.

The vegetable-tanned leather *de luxe* is a bottle-tanned skin. It is superior to every other class of vegetable-tanned leather in every way, but owing to competition not a great deal is now produced, as it is perhaps the most expensive leather ever put on the market. The method of preparation is as follows.

The skins are usually hard and dry when received, so they are at once soaked down, and when sufficiently soft are either milled in the stocks, drummed in a lattice drum (American dash wheel, fig. 10), or "broken down" over the beam by working on the flesh with a blunt unhairing knife. They are next mellow limed (about 3 weeks), sulphide being used if convenient, unhaired and fleshed as described under heavy leathers, and are then ready for puering. This process is carried through at about 80° F., when the goods are worked on the beam, rinsed, drenched in a bran drench, scudded, and are ready for tanning. The skins are now folded down the centre of the back from neck to butt (tail end), flesh outwards, and the edges are tightly stitched all round to form bags, leaving an aperture at one of the shanks for filling; they are now turned grain outwards and filled with strong sumach liquor and some quantity of solid sumach to fill up the interstices and prevent leakage, after which the open shank is tied up, and they are thrown into warm sumach liquor, where they float about like so many pigs, being continually pushed under the surface with a dole. When struck through they are piled on a shelf above the vat, and by their own weight the liquor is forced through the skins. The tannage takes about 24 hours, and when finished the stitching is ripped up, the skins are slicked out, "strained" on frames and dried. "Straining" consists of nailing the skins out on boards in a stretched condition, or the stretching in frames by means of strings laced in the edge of the frame and attached to the edge of the skin.

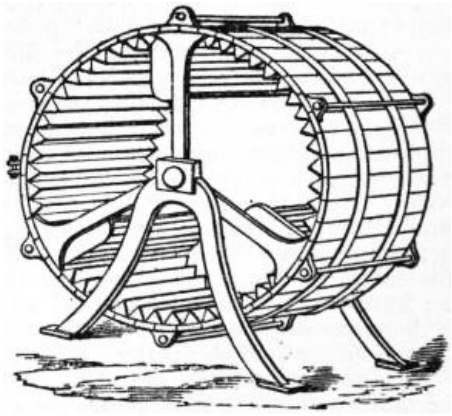


FIG. 10.—Dash Wheel.

The commoner sumach-tanned skins (but still of very good quality) are tanned in paddle wheels, a series of three being most conveniently used in the same manner as the three-pit system of liming, each wheel having three packs of skins through it before being thrown away. This paddling tends to make a bolder grain, as the skins are kept in continual motion, and work over one another. Some manufacturers finish the tannage with a mixture of sumach and oak bark; this treatment yields a less porous product. Others, when the skins are strained and in a semi-dry condition, apply neatsfoot or other oil, or a mixture of glycerine and oil, to the grain to lubricate it and make it more supple; the glycerine mixture is generally used for "chrome" leather, and will be discussed later under that head.



The skins tanned as above are largely dressed as *morocco*. Originally "morocco" was produced by the Moors in southern Spain and Morocco, whence the industry spread to the Levant, Turkey and the Mediterranean coast of Africa generally, where the leather was made from a species of sumach. Peculiarly enough, the dyeing was carried out before the tanning, with Roman alum as "mordant" and kermes, which with the alum produced a fine red colour. Such leather was peculiarly clear in colour, elastic and soft, yet firm and fine in grain and texture, and has long been much prized for bindings, being the material in which most of the artistic work of the 16th-century binders was executed. Now, in addition to the genuine morocco made from goat skins, we have imitation or French moroccos, for which split calf and especially sheep skins are employed, and as the appearance of morocco is the result of the style of graining and finish, which can now be imitated by printing or embossing machines, morocco can be made from all varieties of thin leather.

Great quantities of "Persian" (East India tanned) sheep and goat are now dressed as moroccos and for innumerable other purposes, the method being as follows: The goods are tanned with turwar bark and cassia bark, besides being impregnated with sesame oil, even to the extent of 30%. The first operation is to "strip" them of the oil and original tannage as far as possible, by drumming in a solution of soda; the soap thus formed is got rid of by

thoroughly washing the goods, when they are “soured” in a weak bath of sulphuric acid to brighten the colour and remove iron stains, after which they are washed up and re-tanned by drumming in warm sumach, allowing about 4 oz. per skin. They are then slicked out, dried and are ready for dyeing.

The tanning of sheep and lamb skins differs very essentially from the tanning of goat and other leathers, mainly in the preparatory processes. As the wool is completely destroyed by lime, other methods have to be resorted to. The process usually practised is known as “sweating”; this consists of hanging the moist skins up in a warm, badly-ventilated chamber and allowing incipient putrefaction to set in. The chamber is always kept warm and saturated with moisture, either by means of a steam jet or water sprinklers. During the process large quantities of ammoniacal vapours are given off, and after two or three days the skins become slimy to the touch, and the wool slips easily; at this stage the goods are removed, for if the putrefaction goes too far the grain of the skin is irretrievably ruined. The wool is now “pulled” by pullers, who throw it into bins arranged to receive the different qualities; for one pelt may have three different grades of wool on it.

Other methods of dewooling are to paint the flesh with a solution of sodium sulphide, or cream of lime made with a solution of sodium sulphide; in either case the goods are piled flesh to flesh for an hour or so, and care is taken that the dewooling agent does not touch the wool. The pelt is then pulled and rapidly swilled in a stream of running water. The goods are now, in some yards, lightly limed to plump them superficially, by paddling in a milk of lime, and at this stage, or when the goods have been “struck through” with tan liquor, they are “degreased” either by hydraulic pressure or by benzene degreasing. This is to expel the oleaginous or fatty matter with which sheep skins are richly impregnated; the average yield is about 4 oz. per skin. The tannage is carried out in much the same way as for goat skins, the goods being started in old acid bark liquors; the general tannage consists of sumach and bark.

*Basils* are sheep skins tanned in various ways. English basils are tanned with oak bark, although, as in all other leathers, inferior tannages are now common; Scotch basils are tanned with larch bark, Australian and New Zealand basils with mimosa bark and Turkish basils with galls. The last are the commonest kind of skins imported into Great Britain, and are usually only semi-tanned. *Roans* are sumach-tanned sheep skins.

*Skivers* are the grain splits of sheep skins, the fleshes of which are finished for chamois leather. The goods are split in the limed state, just as the grains are ready for tanning, and are subsequently treated much as sumach-tanned goat skins, or in any other convenient way; the fleshes, on the other hand, go back into the limes, as it is necessary to get a large quantity of lime into leather which is to be finished as chamois.

*Russia Leather* was originally a speciality of Russia, where it was made from the hides of young cattle, and dressed either a brownish red or black colour for upper leather, bookbinding, dressing-cases, purses, &c. It is now made throughout Europe and America, the best qualities being obtained from Austria. The empyreumatic odour of the old genuine “Russia” leather was derived from a long-continued contact with willow and the bark of the *white* birch, which contains the odorous betulin oil. Horse hides, calf, goat, sheep skins and even splits are now dressed as “Russia leather,” but most of these are of a decidedly inferior quality, and as they are merely treated with birch bark oil to give them something of the odour by which Russia leather is ordinarily recognized, they scarcely deserve the name under which they pass. The present-day genuine Russia leather is tanned like other light leathers, but properly in willow bark, although poplar and spruce fir barks are used. After tanning and setting out the goods are treated with the empyreumatic oil obtained by the dry distillation of birch bark. The red colour commonly seen in Russia leather is now produced by aniline colours, but was originally gained by the application of an infusion of Brazil wood, which was rubbed over the grain with a brush or sponge. Some time ago Russia leather got into disrepute because of its rapid decay; this was owing to its being dyed with a very acid solution of tin salts and cochineal, the acid completely destroying the leather in a year or two. The black leather is obtained by staining with logwood infusion and iron acetate. The leather, if genuine quality, is very watertight and strong, and owing to its impregnation with the empyreumatic oil, it wards off the attacks of insects.

*Seal Leathers, &c.*—The tannage of seal skins is now an important department of the leather industry of the United Kingdom. The skins form one of the items of the whaling industry which principally centres in Dundee, and at that port, as well as at Hull and Peterhead, they are received in large quantities from the Arctic regions. This skin is that of the white hair seal, and must not be confused with the expensive seal fur obtained from Russian and Japanese waters. These white hair seal skins are light but exceedingly close in

texture, yielding a very strong tough leather of large area and fine bold grain, known as *Levant morocco*. The area of the skins renders them suitable for upholstery work, and the flesh splits are dressed in considerable quantity for “japanned” (“patent”) leather and “bolsters,” which are used to grain other skins on, the raised buff affording a grip on the skin being grained and thus preventing slipping. When the skins arrive in the tanyard (generally lightly salted) they are drummed in old drench liquors until soft, dipped into warm water and “blubbered” with a sharp knife; they are then alternately dipped in warm water and drummed several times to remove fat, after which they are heavily limed, as they are still very greasy, and after unhairing and fleshing they are heavily puered for the same reason. The tannage takes about a month, and is much the same as for other leathers, the skins being split when “struck through.”

Alligator leather is now produced to some extent both in the United States and India. The belly and flanks alone are useful. There are no special tanneries or processes for dressing the skins. Layers are not given. The leather is used mostly for small fancy goods, and is much imitated on sheepskin by embossing.

Snake and frog skins are also dressed to some extent, the latter having formed a considerable item in the exports of Japan; they are dressed mostly for cigar cases and pocket books. The general procedure is first to lime the goods and then to remove any scales (in the case of snake skins) by scraping with an unhairing knife on a small beam, after which the skins are bated and tanned in sumach by paddling.

A considerable amount of leather is now produced in Australia from the skins of kangaroo, wallaby and other marsupials. These skins are both tanned and “tawed,” the principal tanning agents being mimosa bark, mallet bark and sugar bush, which abound in Australia. The leather produced is of excellent quality, strong and pliable, and rivals in texture and appearance the kid of Europe; but the circumstance that the animals exist only in the wild state renders them a limited and insecure source of leather.



*Japan and Enamel Leathers.*—Japanning is usually done on flesh splits, whereas enamelling is done on the grain, and if splits are used they are printed and boarded. The leather should be mellow, soft, free from grease, with a firm grain and no inclination to stretch. It is first shaved very smooth, thoroughly scoured with a stone, sumached, washed, slicked out tight and dried; when “sammied,” the grain is buffed to remove scratches and oiled, the goods are then whitened or fluffed, and if too hard, bruised by boarding; enamel goods are now grained. The skins are now tightly nailed on boards and any holes patched up with brown paper, so that the japan shall not touch the flesh when the first thick coat of japan or the “daub” is put on. This is applied so thickly that it cannot soak in, with fine-toothed slicker, and then placed in a hot stove for twenty-four hours until quite dry; the coating is then pumiced smooth and the second thinner coat, termed “blanback,” is applied. This is dried and pumiced, and a fine coating of japan or copal varnish is finally given. This is dried and cooled, and if the goods are for enamel they are boarded.

English japans sometimes contain light petroleum, but no turps. The secret of successful japanning lies in the age of the oil used; the older the linseed oil is, the better the result. To prepare the ground coat, boil 10 gallons linseed oil for one hour with 2 ℔ litharge at 600° F. to jellify the oil, and then add 2 ℔ prussian blue and boil the whole for half an hour longer. Before application the mixture is thinned with 10 gallons light petroleum. For the second coat, boil 10 gallons linseed oil for 2 hours with 2 ℔ prussian blue and 2 ℔ lampblack; when of a thin jelly consistency thin with 5 gallons of benzine or light petroleum. For the finishing coat, boil 5 gallons of linseed oil for 1 hour, then add 1 ℔ prussian blue, and boil for another hour; thin with 10 gallons petroleum and apply with a brush in a warm room. After drying, the goods are mellowed by exposure to the sun for at least three days.

*Tawing.*—Wool rugs are, after the preliminary processes, sometimes tanned in oak bark liquors by paddling, but are generally “tawed,” that is, dressed with alum and salt, and are therefore more suitably dealt with under that head. Tawing implies that the conversion of skins into leather is carried out by means of a mixture of which the more important constituents are mineral salts, such as alum, chrome and iron, which may or may not be supplemented with fatty and albuminous matter, both animal and vegetable.

As an example of alum tawing, calf kid may be taken as characteristic of the process; glove kid is also treated on similar lines. The goods are prepared for tawing in a manner similar to the preparation of tanned leathers, arsenical limes being used to ensure a fine grain. After being well drenched and washed the goods are ready for the tawing process. On the continent of Europe it is usual for the goods to be thrown into a tub with the tawing paste and trodden with the bare feet, although this old-fashioned method is gradually being driven out, and the drum or tumbler is being used.

The tawing paste consists of a mixture of alum, salt, flour, egg yolk and water; the quantities of each constituent diverge widely, every dresser having his own recipe. The following has been used, but cannot well be classed as typical: For 100 ℔ skin take 9 ℔ alum, 5 ℔ salt, dissolve in water, and mix to a thin paste with from 5 to 13 ℔ flour, using 4 to 6 egg yolks for every pound of flour used. Olive oil is also mixed in sometimes. The skins are drummed or trodden, at intervals, in the warm paste for some hours, removed, allowed to drain, and dried rapidly, damped down or "sammied" and "staked" by drawing them to and fro over a blunt knife fixed in the top of a post, and known as a knee stake; this process softens them very considerably. After staking, the goods are wet back and shaved smooth, either with a moon knife, *i.e.* a circular concave convex knife, the centre of which has been cut out, a piece of wood bridging the cavity forming the grip, or with an ordinary currier's shaving knife; the skins are now ready for dyeing and finishing.

*Wool Rug Dressing.*—Wool rugs are first thoroughly soaked, well washed and clean-fleshed, scoured well by rubbing into the wool a solution of soft soap and soda, and then leathered by rubbing into the flesh of the wet skins a mixture consisting of three parts of alum and two parts of salt until they are practically dry; they are now piled up over-night, and the mixture is again applied. After the second or third application the goods should be quite leathered. Other methods consist of stretching the skins in frames and painting the flesh with a solution of alum and salt, or, better, with a solution of basic alum and salt, the alum being made basic by the gradual addition of soda until a permanent precipitate is produced.

The goods are now bleached, for even the most vigorous scouring will not remove the yellow tint of the wool, especially at the tips. There are several methods of bleaching, viz. by hydrogen peroxide, following up with a weak vitriol bath; by potassium permanganate, following up with a bath of sulphurous acid; or by fumigating in an air-tight chamber with burning sulphur. The last-named method is the more general; the wet skins are hung in the chamber, an iron pot containing burning sulphur is introduced, and the exposure is continued for several hours.

If the goods are to be finished white, they are now given a vitriol sour, scoured, washed, retanned, dried, and when dry softened by working with a moon knife. If they are to be dyed, they must be prepared for the dye solution by "chloring," which consists of immersion in a cold solution of bleaching powder for some hours, and then souring in vitriol.

The next step is dyeing. If basic dyes are to be used, it is necessary to neutralize the acidity of the skins by careful addition of soda, and to prevent the tips from being dyed a darker colour than the roots. Glauber salts and acetic acid are added to the dye-bath. The tendency of basic colours to rub off may be overcome by passing the goods through a solution of tannin in the form of cutch, sumach, quebracho, &c.; in fact, some of the darker-coloured materials may be used as a ground colour, thus economizing dyestuff and serving two purposes. If acid colours are used, it is necessary to add sulphuric acid to the dye bath, and in either case colours which will strike below 50° C. must be used, as at that temperature alum leather perishes.

After being dyed, the goods are washed up, drained, and if necessary retanned, the glossing finish is then produced by passing them through a weak emulsion or "fat liquor" of oil, soap and water, after which they are dried, softened by working with a moon knife and beating, when they are combed out, and are ready for the market.

Blacks are dyed by immersing the goods alternately in solutions of logwood and iron, or a one-solution method is used, consisting of a mixture of these two, with, in either case, varying additions of lactic acid and sumach, copper salts, potassium bichromate, &c.; the time of immersion varies from hours to days. After striking, the goods are exposed to the air for some hours in order to oxidize to a good black; they are then well scoured, washed, drained, retanned, dried, softened and combed.

*Chrome Tanning.*—The first chrome tanning process was described by Professor Knapp in 1858 in a paper on "Die Natur und Wesen der Gerberie," but was first brought into commercial prominence by Dr Heinzerling about 1878, and was worked in a most persevering way by the Eglinton Chemical Company, who owned the English patents, though all their efforts failed to produce any lasting effects. Now chrome tanning is almost the most important method of light leather dressing, and has also taken a prominent place in the heavy department, more especially in curried leathers and cases where greater tensile strength is needed. The leather produced is much stronger than any other leather, and will also stand boiling water, whereas vegetable-tanned leather is completely destroyed at 70° C. and alum leather at 50° C.

The theory of chrome tanning is not perfectly understood, but in general terms it consists

of a partial chemical combination between the hide fibre and the chrome salts, and a partial mechanical deposition of chromium oxide in and on the fibre. The wet work, or preparation for tanning, may be taken as much the same as for any other leather.

There are two distinct methods of chrome tanning, and several different methods of making the solutions. The “two bath process” consists of treating the skins with a bichromate in which the chromium is in the acidic state, and afterwards reducing it to the basic state by some reducing agent. The exact process is as follows: To prevent wrinkled or “drawn” grain the goods are first paddled for half an hour in a solution of vitriol and salt, when they are piled or “horsed” up over night, and then, without washing, placed in a solution consisting of 7 ℔ of potassium bichromate, 3½ ℔ of hydrochloric acid to each 100 ℔ of pelts, with sufficient water to conveniently paddle in; it is recommended that 5% of salt be added to this mixture. The goods are run in this for about 3 hours, or until struck through, when they are horsed up for some hours, care being taken to cover them up, and are then ready for the reducing bath. This consists of a 14% solution of plain “hypo,” or hyposulphite of soda, to which, during the process of reduction, frequent additions of hydrochloric acid are made to free the sulphurous and thiosulphuric acids, which are the active reducing agents. After about 3 hours’ immersion, during which time the goods will have changed in colour from bright yellow to bright green, one or two skins are cut in the thickest part, and if the green has struck right through, the pack is removed as tanned, washed up, and allowed to drain.

The “single-bath process” consists of paddling, drumming, or otherwise introducing into the skins a solution of a chrome salt, usually chrome alum, which is already in the basic condition, and therefore does not require reducing. The basic solutions are made as follows: For 100 ℔ of pelts 9 ℔ of chrome alum are dissolved in 9 gallons of water, and 2½ ℔ of washing soda already dissolved in 1 gallon of water are gradually added, with constant stirring. One-third of the solution is added to 80 gallons of water, to which is added 7 ℔ of salt, and the skins are introduced; the other two-thirds are introduced at intervals in two successive portions. Another liquor, used in the same way, is made by dissolving 3 ℔ of potassium bichromate in hot water, adding ½ gallon strong hydrochloric acid and then, gradually, about 1½ ℔ of glucose or grape sugar; this reduces the acidic chrome salt, vigorous effervescence ensuing. The whole is made up to 2 gallons and 5% to 15% of salt is added. In yet another method a chrome alum solution is rendered basic by boiling with “hypo,” and after the reaction has ceased the solution is allowed to settle and the clear portion used.



After tanning, which takes from 8 hours to as many, and even more, days, depending upon the method used and the class of skin being dressed, the skins tanned by both methods are treated in a similar manner, and are neutralized by drumming in borax solution, when they are washed free from borax by drumming in warm water, and are ready for dyeing, a process which will be dealt with further on. The goods are sometimes tanned by suspension, but this method is generally reserved for the tanning of the heavier leathers, which are treated in much the same way, the several processes taking longer.

*Iron Tannage.*—Before leaving mineral tanning, mention may be made of iron tannage, although this has gained no prominent position in commerce. Ferric salts possess powerful tanning properties, and were thoroughly investigated by Professor Knapp, who took out several patents, but the tendency to produce a brittle leather has never been entirely overcome, although it has been greatly modified by the incorporation of organic matter, such as blood, rosin, paraffin, urine, &c. Knapp’s basic tanning liquor is made as follows: A strong solution of ferrous sulphate is boiled and then oxidized to the ferric state by the careful addition of nitric acid. Next, to destroy excess of nitric acid, ferrous sulphate is added until effervescence ceases and the resulting clear orange-coloured solution is concentrated to a varnish-like consistency. It does not crystallize or decompose on concentration. The hides or skins are prepared for tanning in the usual way, and then handled or otherwise worked in solutions of the above iron salt, the solutions, which are at first weak, being gradually strengthened.

The tannage occupies from 2 to 8 days, and the goods are then stuffed in a ventilated drum with greases or soap. If the latter is used, an insoluble iron soap is precipitated on the fibres of the leather, which may then be finally impregnated with stearin and paraffin, and finished in the usual manner as described under Curried Leathers. A very fair leather may also be manufactured by using iron alum and salt in the same manner as described under ordinary alum and salt.

*Combination Tannages.*—Leathers tanned by mixtures or separate baths of both mineral and vegetable tanning agents have now taken an important position in commerce. Such leathers are the Swedish and Danish glove leathers, the United States “dongola leather,” and French glazed kid. The usefulness of such a combination will be evident, for while

vegetable tanning produces fullness, plumpness and resistance to water, the mineral dressing produces a softness unnatural to vegetable tannages without the use of large quantities of oils and fats. It may also be noted that once a leather has been thoroughly tanned with either mineral or vegetable materials, although it will absorb large quantities of the material which has not been first used, it will retain in the main the characteristics of the tannage first applied. The principle had long been used in the manufacture of such tough and flexible leathers as “green leather,” “combing leather” and “picker bands,” but was first applied to the manufacture of imitation glazed kid by Kent in America, who, about 1878, discovered the principle of “fatliquoring,” and named his product “dongola leather.” The discovery of this process revolutionized the manufacture of combination leathers.

The Swedish and Danish glove leathers were first given a dressing of alum and salt, with or without the addition of flour and egg, and were then finished and coloured with vegetable materials, generally with willow bark, although, in cases of scarcity, sumach, oak bark, madder and larch were resorted to. The “green leathers” manufactured in England generally receive about a week’s tannage in gambier liquors, and are finished off in hot alum and salt liquors, after which they are dried, have the crystallized salts slicked off, are damped back, and heavily stuffed with moellon, degras or sod oil. Kent, in the manufacture of his dongola leather, used mixed liquors of gambier alum and salt, and when tanned, washed the goods in warm water to remove excess of tanning agent, piled up to samm, and fatliquored. In making alum combinations it must be borne in mind that alum leather will not glaze, and if a glazed finish is required, a fairly heavy vegetable tannage should be first applied. For dull finishes the mineral tannage may advantageously precede the vegetable.

Very excellent chrome combination leather is also manufactured by the application of the above principles, gambier always being in great favour as the vegetable agent. The use of other materials deprives the leather of its stretch, although they may be advantageously used where the latter property is objectionable.

*Oil Tanning.*—Under the head of oil tanning is included “buff leather,” “buck leather,” “piano leather,” “chamois leather,” and to a greater or lesser extent, “Preller’s crown or helvetia leather.” The process of oil tanning dates back to antiquity, and was known as “shamoying,” now spelt “chamoising.” Chamoising yields an exceedingly tough, strong and durable leather, and forms an important branch of the leather industry. The theory of the process is the same as the theory of currying, which is nothing more or less than chamoising, viz. the lubrication of the fibres by the oil itself and the aldehyde tanning which takes place, due to the oxidation and decomposition of the esters of the fatty acids contained in the oil. The fact that an aldehyde tannage takes place seems to have been first discovered by Payne and Pullman, who took out a patent in 1898, covering formaldehyde and other aldehydes used in alkaline solutions. Their product, “Kaspine” leather, found considerable application in the way of military accoutrements. Chamois, buff, buck and piano leathers are all manufactured by the same process slightly modified to suit the class of hide used, the last three being heavy leathers, the first light.

As regards the process used for chamois leather, the reader will remember, from the account of the vegetable tannage of sheep skins, that after splitting from the limes, the fleshes were thrown back into the pits for another three weeks’ liming (six weeks in all) preparatory to being dressed as chamois leather. It is necessary to lime the goods for oil dressing very thoroughly, and if the grain has not been removed by splitting, as in the case of sheep skins, it is “frized” off with a sharp knife over the beam. The goods are now rinsed, scudded and drenched, dried out until stiff, and stocked in the faller stocks with plenty of cod oil for 2 to 3 hours until they show signs of heating, when they are hung up in a cool shed. This process is repeated several times during a period of from 4 to 6 days, the heat driving the water out of the skins and the oil replacing it. At the end of this time the goods, which will have changed to a brown colour, are hung up and allowed to become as dry as possible, when they are hung in a warm stove for some hours, after which they are piled to heat off, thrown into tepid water and put through a wringing machine. The grease which is recovered from the wringing machine is known commercially as “degras” or “moellon,” and fetches a good price, as it is unrivalled for fatliquoring and related processes, such as stuffing, producing a very soft product. They next receive a warm soda lye bath, and are again wrung; this removes more grease, which forms soap with the lye, and is recovered by treatment with vitriol, which decomposes the soap. The grease which floats on top of the liquor is sold under the name of “sod oil.” This also is a valuable material for fatliquoring, &c., but not so good as degras.

After being wrung out, the goods are bleached by one of the processes mentioned in the section on wool rug dressing, the permanganate method being in general use in England. In countries where a fine climate prevails the soap bleach or “sun bleach” is adopted; this

consists of dipping the goods in soap solution and exposing them to the sun's rays, the process being repeated three or more times as necessary.

The next step is fatliquoring to induce softness, after which they are dried out slowly, staked or "perched" with a moon knife, fluffed on a revolving wheel covered with fine emery to produce the fine "nap" or surface, brushed over with french chalk, fuller's earth or china clay, and finally finished on a very fine emery wheel.

*Preller's Helvetia or Crown Leather.*—This process of leather manufacture was discovered in 1850 by Theodor Klemm, a cabinetmaker of Württemberg, who being then in poor circumstances, sold his patent to an Englishman named Preller, who manufactured it in Southwark, and adopted a crown as his trade mark. Hence the name "crown" leather. The manufacture then spread through Switzerland and Germany, the product being used in the main for picker straps, belting and purposes where waterproof goods were required, such as hose pipes and military water bags. No taste is imparted to the water by this leather.



The process of manufacture is as follows: The hides are unhaired by short liming, painting with lime and sulphide, or sweating, and cleansed by scudding and washing, after which they are coloured in bark liquors, washed up through clean water, and hung up to dry partially. When in a sammied condition the goods are placed on a table and a thick layer of the tanning paste spread on the flesh side. The tanning paste varies with each manufacturer, but the following is the mixture originally used by Preller: 100 parts flour, 100 parts soft fat or horse tallow, 35 parts butter, 88 parts ox brains, 50 parts milk, 15 parts salt or saltpetre.

The hides are now rolled in bundles, placed in a warm drum and worked for 8 to 10 hours, after which they are removed and hung up until half dry, when the process is repeated. Thus they are tumbled 3 to 4 times, set out flesh and grain, rinsed through tepid water, set out, sammied, and curried by coating with glycerin, oil, tallow and degras. The table grease is now slicked off, and the goods are set out in grease, grained and dried.

*Transparent Leather.*—Transparent leather is a rather horny product, somewhat like raw hide, and has been used for stitching belts and picker bands. The goods to be dressed are limed, unhaired, very thoroughly delimed with acids, washed in water, scudded and clean-fleshed right to the veins; they are now stretched in frames, clean-fleshed with a moon knife, and brushed with warm water, when several coats of glycerin, to which has been added some antiseptic such as salicylic or picric acid, are applied; the goods are then dried out, and another coat is applied, and when semi-dry they are drummed in a mixture of glycerin, boracic acid, alum and salt, with the addition of a little bichromate of potash to stain them a yellow colour. After drumming for 2 to 3 hours they are removed, washed up, lightly set out, and stretched in frames to dry, when they are ready for cutting into convenient lengths for use.

*Parchment.*—A certain class of sheep skin known as Hampshires is generally used in the manufacture of this speciality. The skins as received are first very carefully washed to remove all dirt, dewooled, limed for 3 to 4 weeks, they are then cleanly fleshed, unhaired, rinsed up in water, and thickly split, the poorer hides being utilized for chamois; they are now re-split at the fatty strata so that all fat may be easily removed, and while the grains are dressed as skivers, the fleshes are tied in frames, watered with hot water, scraped and coated on both sides with a cream consisting of whiting, soda and water, after which they are dried out in a hot stove. In the drying the whiting mixture absorbs the grease from the skins; in fact, this method of degreasing is often employed in the manufacture of wool rugs. When dry, both sides of the skins are flooded to remove the whiting, and are then well rubbed over with a flat piece of pumice-stone, swilled, dried, re-pumiced, again swilled, and when sammied are rolled off with a wooden roller and dried out.

*Tar and Peat Tanning.*—Tar tanning was discovered by a French chemist named Philippi, who started with the idea that, if coal was a decomposition product of forests, it must still necessarily possess the tanning properties originally present in the trees. However far-fetched such an argument may seem, Philippi succeeded in producing a leather from wood and coal tar at a fairly cheap rate, the product being of excellent texture and strength, but rather below the average in the finish, which was inclined to be patchy, showing oily spots. His method consisted of impregnating the goods with refined tar and some organic acid, but the product does not seem to have taken any hold upon the market, and is not much heard of now.

Peat tanning was discovered by Payne, an English chemist, who was also the co-discoverer of the Payne-Pullman formaldehyde tanning process. His peat or humic acid tannage was patented by him about 1905, and is now worked on a commercial scale. The humic acid is first extracted from the peat by means of alkalis, and the hides are treated with this solution, the humic acid being afterwards precipitated in the hides by treatment with some stronger organic or mineral acid.

*Dyeing, Staining and Finishing.*—These operations are practised almost exclusively on the lighter leathers. Heavy leathers, except coloured and black harness and split hides for bag work, are not often dyed, and their finishing is generally considered to be part of the tannage. In light leathers a great business is done in buying up “crust” stock, *i.e.* rough tanned stock, and then dyeing and finishing to suit the needs and demands of the various markets. The carrying out of these operations is a distinct and separate business from tanning, although where possible the two businesses are carried on in the same works.

Whatever the goods are and whatever their ultimate finish, the first operation, upon receipt by the dyer of the crust stock, is sorting, an operation requiring much skill. The sorter must be familiar with the why and wherefore of all subsequent processes through which the leather must go, so as to judge of the suitability of the various qualities of leather for these processes, and to know where any flaws that may exist will be sufficiently suppressed or hidden to produce a saleable product, or will be rendered entirely unnoticeable. The points to be considered in the sorting are coarseness or fineness of texture, boldness or fineness of grain, colour, flaws including stains and scratches, substance, &c. Light-coloured and flawless goods are parcelled out for fine and delicate shades, those of darker hue and few flaws are parcelled out for the darker shades, such as maroons, greens (sage and olive), dark blues, &c., and those which are so badly stained as to be unsuitable for colours go for blacks. After sorting, the goods are soaked back to a limp condition by immersion in warm water, and are then horsed up to drip, having been given, perhaps, a preliminary slicking out.

Up to this point all goods are treated alike, but the subsequent processes now diverge according to the class of leather being treated and the finish required.

Persian goods for glacés, moroccos, &c., require special preparation for dyeing, being first re-tanned. As received, they are sorted and soaked as above, piled to samm, and shaved. Shaving consists of rendering the flesh side of the skins smooth by shaving off irregularities, the skin, which is supported on a rubber roller actuated by a foot lever, being pressed against a series of spiral blades set on a steel roller, which is caused to revolve rapidly. When shaved, the goods are stripped, washed up, soured, sweetened and re-tanned in sumach, washed up, and slicked out, and are then ready for dyeing.

There are three distinct methods of dyeing, with several minor modifications. Tray dyeing consists of immersing the goods, from 2 to 4 dozen at a time, in two separate piles, in the dye solution at 60° C, contained in a flat wooden tray about 5 ft. × 4 ft. × 1 ft., and keeping them constantly moving by continually turning them from one pile to the other. The disadvantages of this method are that the bath rapidly cools, thus dyeing rapidly at the beginning and slowly at the termination of the operation; hence a large excess of dye is wasted, much labour is required, and the shades obtained are not so level as those obtained by the other methods. But the goods are under observation the whole time, a very distinct advantage when matching shades, and a white flesh may be preserved. The paddle method of dyeing consists of paddling the goods in a large volume of liquor contained in a semi-circular wooden paddle for from half to three-quarters of an hour. The disadvantages are that the liquor cools fairly rapidly, more dye is wasted than in the tray method, and a white flesh cannot be preserved. But larger packs can be dyed at the one operation, the goods are under observation the whole time, and little labour is required.

The drum method of dyeing is perhaps best, a drum somewhat similar to that used by curriers being preferable. The goods are placed on the shelves inside the dry drum, the lid of which is then fastened on, and the machinery is started; when the drum is revolving at full speed, which should be about 12 to 15 revolutions per minute, the dye solution is added through the hollow axle, and the dyeing continued for half an hour, when, without stopping the drum, if desired, the goods may be fatliquored by running in the fatliquor through the hollow axle. The disadvantages are that the flesh is dyed and the goods cannot be seen. The advantages are that little labour is required, a large pack of skins may be treated, level shades are produced, heat is retained, almost complete exhaustion of the dye-bath is effected, and subsequent processes, such as fatliquoring, may be carried out without stopping the drum.

Of the great number of coal-tar dyes on the market comparatively few can be used in leather manufacture. The four chief classes are: (1) acid dyes; (2) basic or tannin dyes; (3) direct or cotton dyes; (4) mordant (alizarine) dyes.

Acid dyes are not so termed because they have acid characteristics; the name simply denotes that for the development of the full shade of colour it is necessary to add acid to the dye-bath. These dyes are generally sodium salts of sulphonic acids, and need the addition of

an acid to free the dye, which is the sulphonic acid. Although theoretically any acid (stronger than the sulphonic acid present) will do for this purpose, it is found in practice that only sulphuric and formic acids may be employed, because others, such as acetic, lactic, &c., do not develop the full shade of colour. Acid sodium sulphate may also be successfully used.



Acid colours produce a full level shade without bronzing, and do not accentuate any defects in the leather, such as bad grain, &c. They are also moderately fast to light and rubbing. They are generally applied to leather at a temperature between 50° and 60° C., with an equal weight of sulphuric acid. The quantity of dye used varies, but generally, for goat, persians, &c., from 25 to 30 oz. are used per ten dozen skins, and for calf half as much again, dissolved in such an amount of water as is most convenient according to the method being used. If sodium bisulphate is substituted for sulphuric acid twice as much must be used, and if formic acid three times as much (by weight).

Basic dyes are salts of organic colour bases with hydrochloric or some other suitable acid. Basic colours precipitate the tannins, and thus, because of their affinity for them, dye very rapidly, tending to produce uneven shades, especially if the tannin on the skin is unevenly distributed. They are much more intense in colour than the acid dyes, have a strong tendency to bronze, and accentuate weak and defective grain. They are also precipitated by hard waters, so that the hardness should be first neutralized by the addition of acetic acid, else the precipitated colour lake may produce streakily dyed leather. To prevent rapid dyeing, acetic acid or sodium bisulphate should always be added in small quantity to the dye-bath, preferably the latter, as it prevents bronzing. The most important point about the application of basic dyes to leather is the previous fixation of the tannin on the surface of the leather to prevent its bleeding into the dye-bath and precipitating the dye. All soluble salts of the heavy metals will fix the tannin, but few are applicable, as they form colour lakes, which are generally undesirable. Antimony and titanium salts are generally used, the forms being tartar emetic (antimony potassium tartrate), antimonine (antimony lactate), potassium titanium oxalate, and titanium lactate. The titanium salts are economically used when dyeing browns, as they produce a yellowish-brown shade; it is therefore not necessary to use so much dye. About 2 oz. of tartar emetic and 8 oz. of salt is a convenient quantity for 1 dozen goat skins. The bath is used at 30° to 40° C., and the goods are immersed for about 15 minutes, having been thoroughly washed before being dyed. Iron salts are sometimes used by leather-stainers for saddening (dulling) the shade of colour produced, iron tannate, a black salt, being formed. It is often found economical to “bottom” goods with acid, direct, or other colours, and then finish with basic colours; this procedure forms a colour lake, and colour lakes are always faster to light and rubbing than the colours themselves.

Direct cotton dyes produce shades of great delicacy, and are used for the dyeing of pale and “art” shades. They are applied in neutral or very slightly acid baths, formic and acetic acids being most suitable with the addition of a quantity of sodium chloride or sulphate. After dyeing, the goods are well washed to free from excess of salt. The eosine colours, including erythrosine, phloxine, rose Bengal, &c., are applied in a similar manner, and are specially used for the beautiful fluorescent pink shades they produce; acid and basic colours and mineral acids precipitate them.

The mordant colours, which include the alizarine and anthracene colours, are extremely fast to light, and require a mordant to develop the colour. They are specially applicable to chamois leather, although a few may be used for chrome and alum leathers, and one or two are successfully applied to vegetable-tanned leather without a mordant.

Sulphur or sulphide colours, the first of which to appear were the famous Vidal colours, are applied in sodium sulphide solution, and are most successfully used on chrome leather, as they produce a colour lake with chrome salts, the resulting colour being very fast to light and rubbing. A very serious disadvantage in connexion with them is that they must necessarily be applied in alkaline solution, and the alkali has a disintegrating effect upon the fibre of the leather, which cannot be satisfactorily overcome, although formaldehyde and glycerin mixtures have been patented for the purpose.

The Janus colours are perhaps worth mentioning as possessing both acid and basic characteristics; they precipitate tannin, and are best regarded as basic dyes from a leather-dyer’s standpoint.

The goods after dyeing are washed up, slicked out on an inclined glass table, nailed on boards, or hung up by the hind shanks to dry out.

Coal-tar dyes are not much used for the production of blacks, as they do not give such a satisfactory result as logwood with an iron mordant. In the dyeing of blacks the preliminary operation of souring is always omitted and that of sumaching sometimes, but if much tan has been removed it will be found necessary to use sumach, although cutch may be advantageously and cheaply substituted. After shaving, the goods, if to be dressed for “blue

backs" (blue-coloured flesh), are dyed as already described, with methyl violet or some other suitable dye; they are then folded down the back and drawn through a hot solution of logwood and fustic extracts, and then rapidly through a weak, cold iron sulphate and copper acetate solution. Immediately afterwards they are rinsed up and either drummed in a little neatsfoot oil or oiled over with a pad, flesh and grain, and dried. When dry the goods are damped back and staked, dried out and re-staked.

After dry-staking, the goods are "seasoned," *i.e.* some suitable mixture is applied to the grain to enable it to take the glaze. The following is typical: 3 quarts logwood liquor, ½ pint bullock's blood, ½ pint milk, ½ gill ammonia, ½ gill orchil and 3 quarts water. This season is brushed well into the grain, and the goods are dried in a warm stove and glazed by machine. The skins are glazed under considerable pressure, a polished glass slab or roller being forced over the surface of the leather in a series of rapid strokes, after which the goods are re-seasoned, re-staked, fluffed, re-glazed, oiled over with a pad, dipped in linseed oil and dried. They are now ready for market. If the goods are to be finished dull they are seasoned with linseed mucilage, casein or milk (many other materials are also used), and rolled, glassed with a polished slab by hand, or ironed with a warm iron.

Coloured glacés are finished in a similar manner to black glacés, dye (instead of logwood and iron) being added to the season, which usually consists of a simple mixture of dye, albumen and milk.

Moroccos and grain leathers are boarded on the flesh side before and after glazing, often being "tooth rolled" between the several operations. Tooth rolling consists of forcing, under pressure, a toothed roller over the grain; this cuts into the leather and helps to produce many grains, which could not be produced naturally by boarding, besides fixing them.

Many artificial grains and patterns are also given to leather by printing and embossing, these processes being carried out by passing the leather between two rollers, the top one upon which the pattern is engraved being generally steam heated. This impresses the pattern upon the grain of the leather.

The above methods will give a very general idea of the processes in vogue for the dressing of goods for fancy work. The dressing of chrome leathers for uppers is different in important particulars.

*Chrome Box and Willow Calf.*—Willow calf is coloured calf, box calf is dressed black and grained with a "box" grain. A large quantity of kips is now dressed as box calf; these goods are the hides of yearling Indian cattle, and are dressed in an exactly similar manner as calf. After tanning and boraxing to neutralize the acidity of the chrome liquor, the goods are washed up, sammied, shaved, and are ready for mordanting previous to dyeing. Very few dyes will dye chrome leather direct, *i.e.* without mordanting. Sulphide colours are not yet in great demand, nor are the alizarines used as much as they might be. The ordinary acid and basic dyes are more generally employed, and the goods consequently require to be first mordanted. The mordanting is carried out by drumming the goods in a solution containing tannin, and, except for pale shades, some dyewood extract is used; for reds peachwood extract, for browns fustic or gambier, and for dark browns a little logwood is added. For all pale shades sumach is exclusively used. After drumming in the warm tannin infusion for half an hour, if the goods are to be dyed with basic colours the tannin is first fixed by drumming in tartar emetic and salt, or titanium, as previously described; the dyeing is also carried out as described for persians, except that a slightly higher temperature may be maintained. If the goods are to be dyed black they are passed through logwood and iron solutions.

After dyeing and washing up, &c., the goods are fatliquored by placing them in a previously heated drum and drumming them with a mixture known as a "fatliquor," of which the following recipe is typical: Dissolve 3 ℔ of soft soap by boiling with 3 gallons of water, then add 9 ℔ of neatsfoot oil and boil for some minutes; now place the mixture in an emulsifier and emulsify until cooled to 35° C., then add the yolks of 5 fresh eggs and emulsify for a further half hour. The fatliquor is added to the drum at 55° C., and the goods are drummed for half an hour, when all the fatliquor should be absorbed; they are then slicked out and dried. After drying, they are damped back, staked, dried, re-staked and seasoned with materials similar to those used for persians; when dry they are glazed, boarded on the flesh ("grained") from neck to butt and belly to belly to give them the box grain, fluffed, reseasoned, reglazed and regrained.

*Finishing of Bag Hides.*—The goods are first soaked back, piled to samm, split or shaved, scoured by machine, finished off by hand, washed up and retanned by drumming in warm sumach and extract, after which they are washed up, struck out, hung up to samm, and "set." "Setting" consists of laying the grain flat and smooth by striking out with a steel or

sharp brass slicker. They are then dried out, topped with linseed mucilage, and again dried. This brushing over with linseed mucilage prevents the dye from sinking too far into the leather; gelatine, Irish moss, starch and gums are also used for the same purpose. These materials are also added to the staining solution to thicken it and further prevent its sinking in.

When dry, the goods are stained by applying a ½% (usually) solution of a suitable basic dye, thickened with linseed, with a brush. Two men are usually employed on this work; one starts at the right-hand flank and the other at the left-hand shank, and they work towards each other, staining in sections; much skill is needed to obviate markings where the sections overlap. The goods may advantageously be bottomed with an acid dye or a dye-wood extract, and then finished with basic dyes. Whichever method is used, two to three coats are given, drying between each. After the last coat of stain, and while the goods are still in a sammied condition, a mixture of linseed mucilage and French chalk is applied to the flesh and glassed off wet, to give it a white appearance, and then the goods are printed with any of the usual bag grains by machine or hand, and dried out. For a bright finish the season may consist of a solution of 15 parts carnauba wax, 10 parts curd soap and 100 parts water boiled together; this is sponged into the grain, dried and the hides are finished by either glassing or brushing. For a duller finish the grain is simply rubbed over with buck tallow and brushed. Hide bellies for small work are treated in much the same manner.

*Glove Leathers.*—As these goods were tanned in alum, salt, flour and egg, any undue immersion in water removes the tannage; for this reason they are generally stained like bag hides, one man only being employed on the same skin. The skins are first thoroughly soaked in warm water and then drummed for some minutes in a fresh supply, when they are re-egged to replace that which has been lost. This is best done by drumming them for about 1½ hours in 40 to 50 egg yolks and 5 ℔ of salt for every hundred skins; they are then allowed to be in pile for 24 hours, and are set out on the table ready for mordanting. The mordants universally used are ammonia or alkaline soft soap; 1 in 1000 of the former or a 1% solution of the latter. When the goods have partially dried in, bottoming follows, and usually the natural wood dyestuffs are used for this operation, such as fustic, Brazil wood, peachwood, logwood and turmeric. After application of these colours the goods are sammied and topped with a 1% solution of an acid dye, to which has been added 20% of methylated spirit to prevent frothing with the egg yolk; they are then dried out slowly, staked, pulled in shape, fluffed and brushed by machine. The season, which is sponged on, may consist of 1 part dye, 1 part albumen, 2 parts dextrine and ¼ part glycerine, made up to 100 parts with water; when it has been applied, the goods are sammied, brushed and ironed with a warm flat iron such as is used in laundry work.

*Bookbinding Leathers.*—A committee of the Society of Arts (London) has investigated the question of leather for bookbinding, attention having been drawn to this subject by the rotten and decayed condition often observed in bindings less than fifty years old. This committee engaged in research work extending over several years, and the report in which its results were given was edited for the Society of Arts and the Leathersellers' Company (which also did much important work in connexion with it) by Lord Cobham, chairman of the committee, and Sir Henry Trueman Wood, secretary of the society. The essence of the report, so far as leather manufacture is concerned, is as follows: The goods should be soaked and limed in fresh liquors, and bating and puering should be avoided, weak organic acids or erodine being used; they should also be tanned with pyrogallol tanning materials, and preferably with sumach. In shaving, they should only be necked and backed, *i.e.* only irregularities should be removed, as further shaving has a considerable weakening effect on the fibre. The striking out should not be heavy enough to lay the fibre. In dyeing, acid dyes and a few direct colours only are permissible, and in connexion with the former the use of sulphuric acid is strongly condemned, as it absolutely disintegrates the fibre; the use of formic, acetic and lactic acids is permitted. The use of salts of mineral acids is to be avoided, and in finishing, tight setting out and damp glazing is not to be recommended; oil may be advantageously used.

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(J. G. P.*)

1 See Lye.

**LEATHER, ARTIFICIAL.** Under the name of artificial leather, or of American leather cloth, large quantities of a material having, more or less, a leather-like surface are used, principally for upholstery purposes, such as the covering of chairs, lining the tops of writing desks and tables, &c. There is considerable diversity in the preparation of such materials. A common variety consists of a web of calico coated with boiled linseed oil mixed with dryers and lampblack or other pigment. Several coats of this mixture are uniformly spread, smoothed and compressed on the cotton surface by passing it between metal rollers, and when the surface is required to possess a glossy enamel-like appearance, it receives a finishing coat of copal varnish. A grained morocco surface is given to the material by passing it between suitably embossed rollers. Preparations of this kind have a close affinity to cloth waterproofed with indiarubber, and to such manufactures as ordinary waxcloth. An artificial leather which has been patented and proposed for use as soles for boots, &c., is composed of powdered scraps and cuttings of leather mixed with solution of guttapercha dried and compressed. In place of the guttapercha solution, oxidized linseed oil or dissolved resin may be used as the binding medium for the leather powder.

**LEATHERHEAD,** an urban district in the Epsom parliamentary division of Surrey, England, 18 m. S.S.W. of London, on the London, Brighton & South Coast and the London & South-Western railways. Pop. (1901) 4694. It lies at the foot of the North Downs in the pleasant valley of the river Mole. The church of St Mary and St Nicholas dates from the 14th century. St John’s Foundation School, opened in London in 1852, is devoted to the education of sons of poor clergymen. Leatherhead has brick-making and brewing industries, and the district is largely residential.

**LEATHES, STANLEY** (1830-1900), English divine and Orientalist, was born at Ellesborough, Bucks, on the 21st of March 1830, and was educated at Jesus College, Cambridge, where he graduated B.A. in 1852, M.A. 1853. In 1853 he was the first Tyrwhitt’s Hebrew scholar. He was ordained priest in 1857, and after serving several curacies was appointed professor of Hebrew at King’s College, London, in 1863. In 1868-1870 he was Boyle lecturer (*The Witness of the Old Testament to Christ*), in 1873 Hulsean lecturer (*The Gospel its Own Witness*), in 1874 Bampton Lecturer (*The Religion of the Christ*) and from 1876 to 1880 Warburtonian lecturer. He was a member of the Old Testament revision committee from 1870 to 1885. In 1876 he was elected prebendary of St Paul’s Cathedral, and he was rector of Cliffe-at-Hoo near Gravesend (1880-1889) and of Much Hadham, Hertfordshire (1889-1900). The university of Edinburgh gave him the honorary degree of D.D. in 1878, and his own college made him an honorary fellow in 1885. Besides the lectures noted he published *Studies in Genesis* (1880), *The Foundations of Morality* (1882) and some volumes of sermons. He died in May 1900.

His son, Stanley Mordaunt Leathes (b. 1861), became a fellow of Trinity, Cambridge, and lecturer on history, and was one of the editors of the *Cambridge Modern History*; he was secretary to the Civil Service Commission from 1903 to 1907, when he was appointed a Civil Service Commissioner.

LEAVEN (in Mid. Eng. *levain*, adapted from Fr. *levain*, in same sense, from Lat. *levamen*, which is only found in the sense of alleviation, comfort, *levare*, to lift up), a substance which produces fermentation, particularly in the making of bread, properly a portion of already fermented dough added to other dough for this purpose (see BREAD). The word is used figuratively of any element, influence or agency which effects a subtle or secret change. These figurative usages are mainly due to the comparison of the kingdom of Heaven to leaven in Matt. xiii. 33, and to the warning against the leaven of the Pharisees in Matt. xvi. 6. In the first example the word is used of a good influence, but the more usual significance is that of an evil agency. There was among the Hebrews an association of the idea of fermentation and corruption, which may have been one source of the prohibition of the use of leavened bread in sacrificial offerings. For the usage of unleavened bread at the feasts of the Passover and of Massôth, and the connexion of the two, see PASSOVER.

LEAVENWORTH, a city and the county-seat of Leavenworth county, Kansas, U.S.A., on the W. bank of the Missouri river. Pop. (1900) 20,738, of whom 3402 were foreign-born and 2925 were negroes; (1910 census) 19,363. It is one of the most important railway centres west of the Missouri river, being served by the Atchison, Topeka & Santa Fé, the Chicago, Burlington & Quincy, the Chicago, Rock Island & Pacific, the Chicago Great Western, the Missouri Pacific, the Union Pacific and the Leavenworth & Topeka railways. The city is laid out regularly in the bottom-lands of the river, and its streets are named after Indian tribes. Rolling hills surround it on three sides. The city has many handsome public buildings, and contains the Cathedral of the Immaculate Conception, Leavenworth being the see of a Roman Catholic bishop. The public institutions include the Kansas State Protective Home (1889) for negroes, an Old Ladies' Rest (1892), St Vincent's Orphans' Asylum (1886, open to all sects) and a Guardian Angels' Home (1889), for negroes—all private charities aided by the state; also St John's Hospital (1879), Cushing Hospital (1893) and Leavenworth Hospital (1900), which are training schools for nurses. There is also a branch of the National Home for Disabled Volunteer Soldiers. In the suburbs there are state and United States penitentiaries. Leavenworth is a trading centre and has various manufactures, the most important being foundry and machine shop and flouring and grist-mill products, and furniture. The city's factory products increased in value from $3,251,460 in 1900 to $4,151,767 in 1905, or 27.7%. There are valuable coal mines in Leavenworth and the immediate vicinity. About 3 m. N. of the city, on a reservation of about 6000 acres, is Fort Leavenworth, an important United States military post, associated with which are a National Cemetery and Service Schools of the U.S. Army (founded in 1881 as the U.S. Infantry and Cavalry School and in 1901 developed into a General Service and Staff College). In 1907 there were three general divisions of these schools: the Army School of the Line, for officers (not below the grade of captain) of the regular army and for militia officers recommended by the governors of their respective states or territories, offering courses in military art, engineering, law and languages; the Army Signal School, also open to regular and militia officers, and having departments of field signalling, signal engineering, topography and languages; and the Army Staff College, in which the students are the highest graduates from the Army School of the Line, and the courses of instruction are included in the departments of military art, engineering, law, languages and care of troops. The course is one year in each school. At Fort Leavenworth there is a colossal bronze statue of General U. S. Grant erected in 1889. A military prison was established at Fort Leavenworth in 1875; it was used as a civil prison from 1895 to 1906, when it was re-established as a military prison. Its inmates were formerly taught various trades, but owing to the opposition of labour organizations this system was discontinued, and the prisoners are now employed in work on the military reservation.

The fort, from which the city took its name, was built in 1827, in the Indian country, by Colonel Henry Leavenworth (1783-1834) of the 3rd Infantry, for the protection of traders plying between the Missouri river and Santa Fé. The town site was claimed by Missourians from Weston in June 1854, Leavenworth thus being the oldest permanent settlement in Kansas; and during the contest in Kansas between the anti-slavery and pro-slavery settlers, it was known as a pro-slavery town. It was first incorporated by the Territorial legislature in 1855; a new charter was obtained in 1881; and in 1908 the city adopted the commission plan of government. On the 3rd of April 1858 a free-state convention adopted the Leavenworth Constitution here; this constitution, which was as radically anti-slavery as the Lecompton Constitution was pro-slavery, was nominally approved by popular vote in May 1858, and was later submitted to Congress, but never came into effect. During the Civil War Leavenworth enjoyed great prosperity, at the expense of more inland towns, partly owing to the proximity of the fort, which gave it immunity from border raids from Missouri and was an important depôt of supplies and a place for mustering troops into and out of the service. Leavenworth was, in Territorial days and until after 1880, the largest and most thriving commercial city of the state, and rivalled Kansas City, Missouri, which, however, finally got the better of it in the struggle for railway facilities.

## LEBANON

(from Semitic *laban*, “to be white,” or “whitish,” probably referring not to snow, but to the bare white walls of chalk or limestone which form the characteristic feature of the whole range), in its widest sense is the central mountain mass of Syria, extending for about 100 m. from N.N.E. to S.S.W. It is bounded W. by the sea, N. by the plain Jun Akkar, beyond which rise the mountains of the Ansarieh, and E. by the inland plateau of Syria, mainly steppe-land. To the south Lebanon ends about the point where the river Litany bends westward, and at Banias. A valley narrowing towards its southern end, and now called the Buka’a, divides the mountainous mass into two great parts. That lying to the west is still called Jebel Libnan; the greater part of the eastern mass now bears the name of the Eastern Mountain (Jebel el-Sharḳi). In Greek the western range was called Libanos, the eastern Antilibanos. The southern extension of the latter, Mount Hermon (*q.v.*), may in many respects be treated as a separate mountain.

Lebanon and Anti-Lebanon have many features in common; in both the southern portion is less arid and barren than the northern, the western valleys better wooded and more fertile than the eastern. In general the main elevations of the two ranges form pairs lying opposite one another; the forms of both ranges are monotonous, but the colouring is splendid, especially when viewed from a distance; when seen close at hand only a few valleys with perennial streams offer pictures of landscape beauty, their rich green contrasting pleasantly with the bare brown and yellow mountain sides. The finest scenery is found in N. Lebanon, in the Maronite districts of Kesrawan and Bsherreh, where the gorges are veritable canyons, and the villages are often very picturesquely situated. The south of the chain is more open and undulating. Anti-Lebanon is the barest and most inhospitable part of the system.

The district west of Lebanon, averaging about 20 m. in breadth, slopes in an intricate series of plateaus and terraces to the Mediterranean. The coast is for the most part abrupt and rocky, often leaving room for only a narrow path along the shore, and when viewed from the sea it does not suggest the extent of country lying between its cliffs and the lofty summits behind. Most of the mountain spurs run from east to west, but in northern Lebanon the prevailing direction of the valleys is north-westerly, and in the south some ridges run parallel with the principal chain. The valleys have for the most part been deeply excavated by mountain streams; the apparently inaccessible heights are crowned by numerous villages, castles or cloisters embosomed among trees. The chief perennial streams, beginning from the north, are the Nahr Akkar, N. Arka, N. el-Barid, N. Kadisha, “the holy river” (the valley of which begins in the immediate neighbourhood of the highest summits, and rapidly descends in a series of great bends till the river reaches the sea at Tripoli), Wadi el-Joz (falling into the sea at Batrun), Wadi Fidar, Nahr Ibrahim (the ancient Adonis, having its source in a recess of the great mountain amphitheatre where the famous sanctuary Apheca, the modern Afka, lay), Nahr el-Kelb (the ancient Lycus), Nahr Beirut (the ancient Magoras, entering the sea at Beirut), Nahr Damur (ancient Tamyras), Nahr el-’Auwali (the ancient Bostrenus, which in the upper part of its course is joined by the Nahr el-Baruk). The ‘Auwali and the Nahr el-Zaherani, the only other considerable streams before we reach the Litany,

flow north-east to south-west, in consequence of the interposition of a ridge subordinate and parallel to the central chain. On the north, where the mountain bears the special name of Jebel Akkar, the main ridge of Lebanon rises gradually from the plain. A number of valleys run to the north and north-east, among them that of the Nahr el-Kebir, the Eleutherus of the ancients, which rises in the Jebel el-Abiad on the eastern slope of Lebanon, and afterwards, skirting the district, flows westward to the sea. South of Jebel el-Abiaḍ, beneath the main ridge, which as a rule falls away suddenly towards the east, occur several small elevated terraces having a southward slope; among these are the Wadi en-Nusur (“vale of eagles”), and the basin of the lake Yammuna, with its intermittent spring Neb’a el-Arba’in. Of the streams which descend into the Buka’a, the Berdani rises in Jebel Sunnin, and enters the plain by a deep and picturesque mountain cleft at Zaḥleh.

The most elevated summits occur in the north, but even these are of very gentle gradient. The “Cedar block” consists of a double line of four and three summits respectively, ranged from north to south, with a deviation of about 35°. Those to the east are ‘Uyun Urghush, Makmal, Muskiyya (or Naba’ esh-Shemaila) and Ras Zahr el-Kazib; fronting the sea are Kam Sauda or Timarun, Fumm el-Mizab and Zahr el-Kandil. The height of Zahr el-Kazib, by barometric measurement, is 10,018 ft.; that of the others does not reach 10,000 ft. South from them is the pass (8351 ft.) which leads from Baalbek to Tripoli; the great mountain amphitheatre on the west side of its summit is remarkable. Farther south is a second group of lofty summits—the snow-capped Sunnin, visible from Beirut; its height is 8482 ft. Between this group and the more southerly Jebel Keniseh (about 6700 ft.) lies the pass (4700 ft.) traversed by the French post road between Beirut and Damascus. Among the bare summits still farther south are the long ridge of Jebel el-Baruk (about 7000 ft.), the Jebel Niha, with the Tau’amat Niha (about 6100 ft.), near which is a pass to Sidon, and the Jebel Rihan (about 5400 ft.).



The Buka’a, the broad valley which separates Lebanon from Anti-Lebanon, is watered by two rivers having their watershed near Baalbek, at an elevation of about 3600 ft., and separated only by a short mile at their sources. That flowing northwards, El-’Asi, is the ancient Orontes (*q.v.*); the other is the Litany. In the lower part of its course the latter has scooped out a deep and narrow rocky bed; at Burghuz it is spanned by a great natural bridge. Not far from the point where it suddenly trends to the west lie, immediately above the romantic valley, at an elevation of 1500 ft., the imposing ruins of the old castle Kal’at esh-Shakif, near one of the passes to Sidon. In its lower part the Litany bears the name of Nahr el-Kasimiya. Neither the Orontes nor the Litany has any important affluent.

The Buka’a used to be known as Coelesyria (Strabo. xvi. 2, 21); but that word as employed by the ancients had a much more extensive application. At present its full name is Buka’a el-’Aziz (the dear Buka’a), and its northern portion is known as Sahlet Ba’albek (the plain of Baalbek). The valley is from 4 to 6 m. broad, with an undulating surface.

The Anti-Lebanon chain has been less fully explored than that of Lebanon. Apart from its southern offshoots it is 67 m. long, while its width varies from 16 to 13½ m. It rises from the plain of Hasya-Homs, and in its northern portion is very arid. The range has not so many offshoots as occur on the west side of Lebanon; under its precipitous slopes stretch table-lands and broad plateaus, which, especially on the east side looking towards the steppe, steadily increase in width. Along the western side of northern Anti-Lebanon stretches the Khasha’a, a rough red region lined with juniper trees, a succession of the hardest limestone crests and ridges, bristling with bare rock and crag that shelter tufts of vegetation, and are divided by a succession of grassy ravines. On the eastern side the parallel valley of ‘Asal el-Ward deserves special mention; the descent towards the plain eastwards, as seen for example at Ma’lula, is singular—first a spacious amphitheatre and then two deep very narrow gorges. Few perennial streams take their rise in Anti-Lebanon; one of the finest and best watered valleys is that of Helbun, the ancient Chalybon, the Helbon of Ezek. xxvii. 18. The highest points of the range, reckoning from the north, are Halimat el-Kabu (8257 ft.), which has a splendid view; the Fatli block, including Tal’at Musa (8721 ft.) and the adjoining Jebel Nebi Baruh (7900 ft.); and a third group near Bludan, in which the most prominent names are Shakif, Akhyar and Abu’l-Hin (8330 ft.); Of the valleys descending westward the first to claim mention is the Wadi Yafufa; a little farther south, lying north and south, is the rich upland valley of Zebedani, where the Barada has its highest sources. Pursuing an easterly course, this stream receives the waters of the romantic ‘Ain Fije (which doubles its volume), and bursts out by a rocky gateway upon the plain of Damascus, in the irrigation of which it is the chief agent. It is the Abana of 2 Kings v. 12; the portion of Anti-Lebanon traversed by it was also called by the same name (Canticles iv. 8). From the point where the southerly continuation of Anti-Lebanon begins to take a more westerly direction, a low ridge shoots out towards the south-west, trending farther and farther away from the eastern chain and narrowing the Buka’a; upon the eastern side of this ridge lies the elevated valley or hilly stretch known as Wadi et-Teim. In the north, beside ‘Ain Faluj, it is connected by a low

watershed with the Buka'a; from the gorge of the Litany it is separated by the ridge of Jebel eḍ-Ḍahr. At its southern end it contracts and merges into the plain of Baṇias, thus enclosing Mount Hermon on its north-west and west sides; eastward from the Hasbany branch of the Jordan lies the meadow-land Merj 'Iyun, the ancient Ijon (1 Kings xv. 20).

*Vegetation.*—The western slope of Lebanon has the common characteristics of the flora of the Mediterranean coast, but the Anti-Lebanon belongs to the poorer region of the steppes, and the Mediterranean species are met with only sporadically along the water-courses. Forest and pasture land do not properly exist: the place of the first is for the most part taken by a low brushwood; grass is not plentiful, and the higher ridges maintain alpine plants only so long as patches of snow continue to lie. The rock walls harbour some rock plants, but many absolutely barren wildernesses of stone occur. (1) On the western slope, to a height of 1600 ft., is the coast region, similar to that of Syria in general and of the south of Asia Minor. Characteristic trees are the locust tree and the stone pine; in *Melia Azedarach* and *Ficus Sycomorus* (Beirut) is an admixture of foreign and partially subtropical elements. The great mass of the vegetation, however is of the low-growing type (*maquis* or *garrigue* of the western Mediterranean), with small and stiff leaves, and frequently thorny and aromatic, as for example the ilex (*Quercus coccifera*), *Smilax*, *Cistus*, *Lentiscus*, *Calycotome*, &c. (2) Next comes, from 1600 to 6500 ft., the mountain region, which may also be called the forest region, still exhibiting sparse woods and isolated trees wherever shelter, moisture and the inhabitants have permitted their growth. From 1600 to 3200 ft. is a zone of dwarf hard-leaved oaks, amongst which occur the Oriental forms *Fontanesia phillyraeoides*, *Acer syriacum* and the beautiful red-stemmed *Arbutus Andrachne*. Higher up, between 3700 and 4200 ft., a tall pine, *Pinus Brutia*, is characteristic. Between 4200 and 6200 ft. is the region of the two most interesting forest trees of Lebanon, the cypress and the cedar. The former still grows thickly, especially in the valley of the Kadisha; the horizontal is the prevailing variety. In the upper Kadisha valley there is a cedar grove of about three hundred trees, amongst which five are of gigantic size. (See also CEDAR.) The cypress and cedar zone exhibits a variety of other leaf-bearing and coniferous trees; of the first may be mentioned several oaks—*Quercus subalpina* (Kotschy), *Q. Cerris* and the hop-hornbeam (*Ostrya*); of the second class the rare Cilician silver fir (*Abies cilicica*) may be noticed. Next come the junipers, sometimes attaining the size of trees (*Juniperus excelsa*, *J. rufescens* and, with fruit as large as plums, *J. drupacea*). But the chief ornament of Lebanon is the *Rhododendron ponticum*, with its brilliant purple flower clusters; a peculiar evergreen, *Vinca libanotica*, also adds beauty to this zone. (3) Into the alpine region (6200 to 10,400 ft.) penetrate a few very stunted oaks (*Quercus subalpina*), the junipers already mentioned and a barberry (*Berberis cretica*), which sometimes spreads into close thickets. Then follow the low, dense, prone, pillow-like dwarf bushes, thorny and grey, common to the Oriental highlands —*Astragalus* and the peculiar *Acantholimon*. They are found to within 300 ft. of the highest summits.

Upon the exposed mountain slopes a species of rhubarb (*Rheum Ribes*) is noticeable, and also a vetch (*Vicia canescens*) excellent for sheep. The spring vegetation, which lasts until July, appears to be rich, especially as regards showy plants, such as *Corydalis*, *Gagea*, *Colchicum*, *Puschkinia*, *Geranium*, *Ornithogalum*, &c. The flora of the highest ridges, along the edges of the snow patches, exhibits no forms related to the northern alpine flora, but suggestions of it are found in a *Draba*, an *Androsace*, an *Alsine* and a violet, occurring, however, only in local species. Upon the highest summits are found *Saponaria Pumilio* (resembling our *Silene acaulis*) and varieties of *Galium*, *Euphorbia*, *Astragalus*, *Veronica*, *Jurinea*, *Festuca*, *Scrophularia*, *Geranium*, *Asphodeline*, *Allium*, *Asperula*; and, on the margins of the snow fields, a *Taraxacum* and *Ranunculus demissus*. The alpine flora of Lebanon thus connects itself directly with the Oriental flora of lower altitudes, and is unrelated to the glacial flora of Europe and northern Asia.

*Zoology.*—There is nothing of special interest about the fauna of Lebanon. Bears are no longer numerous; the panther and the ounce are met with; the wild hog, hyaena, wolf and fox are by no means rare; jackals and gazelles are very common. The polecat and hedgehog also occur. As a rule there are not many birds, but the eagle and the vulture may occasionally be seen; of eatable kinds partridges and wild pigeons are the most abundant.

*Population.*—In the following sections the Lebanon proper will alone be considered, without reference to Anti-Lebanon, because the peculiar political status of the former range since 1864 has effectually differentiated it; whereas the Anti-Lebanon still forms an integral part of the Ottoman province of Syria (*q.v.*), and neither its population nor its history is readily distinguishable from those of the surrounding districts.

The total population in the Lebanon proper is about 400,000, and is increasing faster than the development of the province will admit. There is consequently much emigration, the Christian surplus going mainly to Egypt, and to America, the Druses to the latter country

and to the Hauran. The emigrants to America, however, usually return after making money, build new houses and settle down. The singularly complex population is composed of Christians, Maronites, and Orthodox Eastern and Uniate; of Moslems, both Sunni and Shiah (Metawali); and of Druses.

(*a*) *Maronites* (*q.v.*) form about three-fifths of the whole and have the north of the Mountain almost to themselves, while even in the south, the old Druse stronghold, they are now numerous. Feudalism is practically extinct among them and with the decline of the Druses, and the great stake they have acquired in agriculture, they have laid aside much of their warlike habit together with their arms. Even their instinct of nationality is being sensibly impaired by their gradual assimilation to the Papal Church, whose agents exercise from Beirut an increasing influence on their ecclesiastical elections and church government. They are strong also in the Buka'a, and have colonies in most of the Syrian cities.

(*b*) *Orthodox* Eastern form a little more than one-eighth of the whole, and are strongest in S. Lebanon (Metn and Kurah districts). Syrians by race and Arab-speaking, they are descendants of those "Melkites" who took the side of the Byzantine church in the time of Justinian II. against the Moslems and eventually the Maronites. They are among the most progressive of the Lebanon elements.

(*c*) *Greek Uniate* are less numerous, forming little more than one-twelfth, but are equally progressive. Their headquarters is Zahleh; but they are found also in strength in Metn and Jezzin, where they help to counterbalance Druses. They sympathize with the Maronites against the Orthodox Eastern, and, like both, are of Syrian race, and Arab speech. 

(*d*) *Sunnite Moslems* are a weak element, strongest in Shuf and Kurah, and composed largely of Druse renegades and "Druse" families, which, like the Shehab, were of Arab extraction and never conformed to the creed of Hamza.

(*e*) *Shiite Moslems* outnumber the Sunni, and make about one twenty-fifth of the whole. They are called *Metawali* and are strongest in North Lebanon (Kesrawan and Batrun), but found also in the south, in Buka'a and in the coast-towns from Beirut to Acre. They are said to be descendants of Persian tribes; but the fact is very doubtful, and they may be at least as aboriginal as the Maronites, and a remnant of an old Incarnationist population which did not accept Christianity, and kept its heretical Islam free from those influences which modified Druse creed. They own a chief sheikh, resident at Jeba'a, and have the reputation, like most heretical communities in the Sunni part of the Moslem world, of being exceedingly fanatical and inhospitable. It is undoubtedly the case that they are suspicious of strangers and defiant of interference. Another small body of Shiites, the *Ismailites* (Assassins (*q.v.*) of the crusading chronicles), also said to be of Persian origin, live about Kadmus at the extreme N. of Lebanon, but outside the limits of the privileged province. They are about 9000 strong.

(*f*) *Druses* (*q.v.*), now barely an eighth of the whole and confined to Shuf and Metn in S. Lebanon, are tending to emigrate or conform to Sunni Islam. Since the establishment of the privileged province they have lost the Ottoman support which used to compensate for their numerical inferiority as compared with the Christians; and they are fast losing also their old habits and distinctiveness. No longer armed or wearing their former singular dress, the remnant of them in Lebanon seems likely ere long to be assimilated to the "Osmanli" Moslems. Their feud with the Maronites, whose accentuation in the middle of the 19th century was largely due to the tergiversations of the ruling Shehab family, now reduced to low estate, is dying away, but they retain something of their old clan feeling and feudal organization, especially in Shuf.

The mixed population, as a whole, displays the usual characteristics of mountaineers, fine physique and vigorous independent spirit; but its ancient truculence has given way before strong government action since the middle 19th century, and the great increase of agricultural pursuits, to which the purely pastoral are now quite secondary. The culture of the mulberry and silk, of tobacco, of the olive and vine, of many kinds of fruits and cereals, has expanded enormously, and the Lebanon is now probably the most productive region in Asiatic Turkey in proportion to its area. It exports largely through Beirut and Saida, using both the French railway which crosses S. Lebanon on its way to Damascus, and the excellent roads and mule-paths made since 1883. Lebanon has thick deposits of lignite coal, but of inferior quality owing to the presence of iron pyrites. The abundant iron is little worked. Manufactures are of small account, the raw material going mostly to the coast; but olive-oil is made, together with various wines, of which the most famous is the *vino d'oro*, a sweet liqueur-like beverage. This wine is not exported in any quantity, as it will not bear a voyage well and is not made to keep. Bee-keeping is general, and there is an export of eggs to Egypt.

*History.*—The inhabitants of Lebanon have at no time played a conspicuous part in history.

There are remains of prehistoric occupation, but we do not even know what races dwelt there in the historical period of antiquity. Probably they belonged chiefly to the Aramaean group of nationalities; the Bible mentions Hivites (Judges iii. 3) and Giblites (Joshua xiii. 5). Lebanon was included within the ideal boundaries of the land of Israel, and the whole region was well known to the Hebrews, by whose poets its many excellences are often praised. How far the Phoenicians had any effective control over it is unknown; the absence of their monuments does not argue much real jurisdiction. Nor apparently did the Greek Seleucid kingdom have much to do with the Mountain. In the Roman period the district of *Phoenice* extended to Lebanon. In the 2nd century, with the inland districts, it constituted a subdivision of the province of Syria, having Emesa (Homs) for its capital. From the time of Diocletian there was a *Phoenice ad Libanum*, with Emesa as capital, as well as a *Phoenice Maritima* of which Tyre was the chief city. Remains of the Roman period occur throughout Lebanon. By the 6th century it was evidently virtually independent again; its Christianization had begun with the immigration of Monothelite sectaries, flying from persecution in the Antioch district and Orontes valley. At all times Lebanon has been a place of refuge for unpopular creeds. Large part of the mountaineers took up Monothelism and initiated the national distinction of the Maronites, which begins to emerge in the history of the 7th century. The sectaries, after helping Justinian II. against the caliph Abdalmalik, turned on the emperor and his Orthodox allies, and were named Mardaites (rebels). Islam now began to penetrate S. Lebanon, chiefly by the immigration of various more or less heretical elements, Kurd, Turkoman, Persian and especially Arab, the latter largely after the break-up of the kingdom of Hira; and early in the 11th century these coalesced into a nationality (see Druses) under the congenial influence of the Incarnationist creed brought from Cairo by Ismael Darazi and other emissaries of the caliph Hakim and his vizier Hamza. The subsequent history of Lebanon to the middle of the 19th century will be found under Druses and Maronites, and it need only be stated here that Latin influence began to be felt in N. Lebanon during the Frank period of Antioch and Palestine, the Maronites being inclined to take the part of the crusading princes against the Druses and Moslems; but they were still regarded as heretic Monothelites by Abulfaragius (Bar-Hebraeus) at the end of the 13th century; nor is their effectual reconciliation to Rome much older than 1736, the date of the mission sent by the pope Clement XII., which fixed the actual status of their church. An informal French protection had, however, been exercised over them for some time previously, and with it began the feud of Maronites and Druses, the latter incited and spasmodically supported by Ottoman pashas. The feudal organization of both, the one under the house of Khazin, the other under those of Maan and Shehab successively, was in full force during the 17th and 18th centuries; and it was the break-up of this in the first part of the 19th century which produced the anarchy that culminated after 1840 in the civil war. The Druses renounced their Shehab amirs when Beshir al-Kassim openly joined the Maronites in 1841, and the Maronites definitely revolted from the Khazin in 1858. The events of 1860 led to the formation of the privileged Lebanon province, finally constituted in 1864. It should be added, however, that among the Druses of Shuf, feudalism has tended to re-establish itself, and the power is now divided between the Jumblat and Yezbeki families, a leading member of one of which is almost always Ottoman *kaimakam* of the Druses, and locally called *amir*.

The Lebanon has now been constituted a *sanjak* or *mutessariflik*, dependent directly on the Porte, which acts in this case in consultation with the six great powers. This province extends about 93 m. from N. to S. (from the boundary of the *sanjak* of Tripoli to that of the *caza* of Saida), and has a mean breadth of about 28 m. from one foot of the chain to the other, beginning at the edge of the littoral plain behind Beirut and ending at the W. edge of the Buka'a; but the boundaries are ill-defined, especially on the E. where the original line drawn along the crest of the ridge has not been adhered to, and the mountaineers have encroached on the Buka'a. The Lebanon is under a military governor (*mushir*) who must be a Christian in the service of the sultan, approved by the powers, and has, so far, been chosen from the Roman Catholics owing to the great preponderance of Latin Christians in the province. He resides at Deir al-Kamar, an old seat of the Druse amirs. At first appointed for three years, then for ten, his term has been fixed since 1892 at five years, the longer term having aroused the fear of the Porte, lest a personal domination should become established. Under the governor are seven *kaimakams*, all Christians except a Druse in Shuf, and forty-seven *mudirs*, who all depend on the kaimakams except one in the home district of Deir al-Kamar. A central *mejliss* or Council of twelve members is composed of four Maronites, three Druses, one Turk, two Greeks (Orthodox), one Greek Uniate and one Metawali. This was the original proportion, and it has not been altered in spite of the decline of the Druses and increase of the Maronites. The members are elected by the seven cazas. In each *mudirieh* there is also a local *mejliss*. The old feudal and *mukataji* (see Druses) jurisdictions are abolished, *i.e.* they often persist under Ottoman forms, and three courts of First Instance,

under the *mejliss*, and superior to the petty courts of the *mudirs* and the village *sheikhs*, administer justice. Judges are appointed by the governor, but sheikhs by the villages. Commercial cases, and litigation in which strangers are concerned, are carried to Beirut. The police is recruited locally, and no regular troops appear in the province except on special requisition. The taxes are collected directly, and must meet the needs of the province, before any sum is remitted to the Imperial Treasury. The latter has to make deficits good. Ecclesiastical jurisdiction is exercised only over the clergy, and all rights of asylum are abolished.

This constitution has worked well on the whole, the only serious hitches having been due to the tendency of governors-general and *kaimakams* to attempt to supersede the *mejliss* by autocratic action, and to impair the freedom of elections. The attention of the porte was called to these tendencies in 1892 and again in 1902, on the appointments of new governors. Since the last date there has been no complaint. Nothing now remains of the former French predominance in the Lebanon, except a certain influence exerted by the fact that the railway is French, and by the precedence in ecclesiastical functions still accorded by the Maronites to official representatives of France. In the Lebanon, as in N. Albania, the traditional claim of France to protect Roman Catholics in the Ottoman Empire has been greatly impaired by the non-religious character of the Republic. Like Italy, she is now regarded by Eastern Catholics with distrust as an enemy of the Holy Father.

See DRUSES. Also V. Cuinet, *Syrie, Liban et Palestine* (1896); N. Verney and G. Dambmann, *Puissances étrangères en Syrie*, &c. (1900); G. Young, *Corps de droit ottoman*, vol. i. (1905); G. E. Post, *Flora of Syria*, &c. (1896); M. von Oppenheim, *Vom Mittelmeer*, &c. (1899).

(A. SO.; D. G. H.)

LEBANON, a city of Saint Clair county, Illinois, U.S.A., on Silver Creek, about 24 m. E. of Saint Louis, Missouri. Pop. (1910) 1907. It is served by the Baltimore & Ohio South-Western railroad and by the East Saint Louis & Suburban Electric line. It is situated on a high tableland. Lebanon is the seat of McKendree College, founded by Methodists in 1828 and one of the oldest colleges in the Mississippi valley. It was called Lebanon Seminary until 1830, when the present name was adopted in honour of William McKendree (1757-1835), known as the “Father of Western Methodism,” a great preacher, and a bishop of the Methodist Church in 1808-1835, who had endowed the college with 480 acres of land. In 1835 the college was chartered as the “McKendreean College,” but in 1839 the present name was again adopted. There are coal mines and excellent farming lands in the vicinity of Lebanon. Among the city’s manufactures are flour, planing-mill products, malt liquors, soda and farming implements. The municipality owns and operates its electric-lighting plant. Lebanon was chartered as a city in 1874.

LEBANON, a city and the county-seat of Lebanon county, Pennsylvania, U.S.A., in the fertile Lebanon Valley, about 25 m. E. by N. of Harrisburg. Pop. (1900) 17,628, of whom 618 were foreign-born, (1910 census) 19,240. It is served by the Philadelphia & Reading, the Cornwall and the Cornwall & Lebanon railways. About 5 m. S. of the city are the Cornwall (magnetite) iron mines, from which about 18,000,000 tons of iron ore were taken between 1740 and 1902, and 804,848 tons in 1906. The ore yields about 46% of iron, and contains about 2.5% of sulphur, the roasting of the ores being necessary—ore-roasting kilns are more extensively used here than in any other place in the country. The area of ore exposed is about 4000 ft. long and 400 to 800 ft. wide, and includes three hills; it has been one of the most productive magnetite deposits in the world. Limestone, brownstone and brick-clay also abound in the vicinity; and besides mines and quarries, the city has extensive manufactories of iron, steel, chains, and nuts and bolts. In 1905 its factory products were valued at $6,978,458. The municipality owns and operates its water-works.

The first settlement in the locality was made about 1730, and twenty years later a town was laid out by one of the landowners, George Steitz, and named Steitztown in his honour. About 1760 the town became known as Lebanon, and under this name it was incorporated as a borough in 1821 and chartered as a city in 1885.

LE BARGY, CHARLES GUSTAVE AUGUSTE (1858- ), French actor, was born at La Chapelle (Seine). His talent both as a comedian and a serious actor was soon made evident, and he became a member of the Comédie Française, his chief successes being in such plays as *Le Duel*, *L'Énigme*, *Le Marquis de Priola*, *L'Autre Danger* and *Le Dédale*. His wife, Simone le Bargy née Benda, an accomplished actress, made her début at the Gymnase in 1902, and in later years had a great success in *La Rafale* and other plays. In 1910 he had differences with the authorities of the Comédie Française and ceased to be a *sociétaire*.

LE BEAU, CHARLES (1701-1778), French historical writer, was born at Paris on the 15th of October 1701, and was educated at the Collège de Sainte-Barbe and the Collège du Plessis; at the latter he remained as a teacher until he obtained the chair of rhetoric in the Collège des Grassins. In 1748 he was admitted a member of the Academy of Inscriptions, and in 1752 he was nominated professor of eloquence in the Collège de France. From 1755 he held the office of perpetual secretary to the Academy of Inscriptions, in which capacity he edited fifteen volumes (from the 25th to the 39th inclusive) of the *Histoire* of that institution. He died at Paris on the 13th of March 1778.

The only work with which the name of Le Beau continues to be associated is his *Histoire du Bas-Empire, en commençant à Constantin le Grand*, in 22 vols. 12mo (Paris, 1756-1779), being a continuation of C. Rollin's *Histoire Romaine* and J. B. L. Crevier's *Histoire des empereurs*. Its usefulness arises entirely from the fact of its being a faithful résumé of the Byzantine historians, for Le Beau had no originality or artistic power of his own. Five volumes were added by H. P. Ameilhon (1781-1811), which brought the work down to the fall of Constantinople. A later edition, under the care of M. de Saint-Martin and afterwards of Brosset, has had the benefit of careful revision throughout, and has received considerable additions from Oriental sources.

See his "Éloge" in vol. xlii. of the *Histoire de l'Académie des Inscriptions* (1786), pp. 190-207.

LEBEAU, JOSEPH (1794-1865), Belgian statesman, was born at Huy on the 3rd of January 1794. He received his early education from an uncle who was parish priest of Hannut, and became a clerk. By dint of economy he raised money to study law at Liége, and was called to the bar in 1819. At Liége he formed a fast friendship with Charles Rogier and Paul Devaux, in conjunction with whom he founded at Liége in 1824 the *Mathieu Laensbergh*, afterwards *Le politique*, a journal which helped to unite the Catholic party with the Liberals in their opposition to the ministry, without manifesting any open disaffection to the Dutch government. Lebeau had not contemplated the separation of Holland and Belgium, but his hand was forced by the revolution. He was sent by his native district to the

National Congress, and became minister of foreign affairs in March 1831 during the interim regency of Surlet de Chokier. By proposing the election of Leopold of Saxe-Coburg as king of the Belgians he secured a benevolent attitude on the part of Great Britain, but the restoration to Holland of part of the duchies of Limburg and Luxemburg provoked a heated opposition to the treaty of London, and Lebeau was accused of treachery to Belgian interests. He resigned the direction of foreign affairs on the accession of King Leopold, but in the next year became minister of justice. He was elected deputy for Brussels in 1833, and retained his seat until 1848. Differences with the king led to his retirement in 1834. He was subsequently governor of the province of Namur (1838), ambassador to the Frankfort diet (1839), and in 1840 he formed a short-lived Liberal ministry. From this time he held no office of state, though he continued his energetic support of liberal and anti-clerical measures. He died at Huy on the 19th of March 1865.

Lebeau published *La Belgique depuis 1847* (Brussels, 4 vols., 1852), *Lettres aux électeurs belges* (8 vols., Brussels, 1853-1856). His *Souvenirs personnels et correspondance diplomatique 1824-1841* (Brussels, 1883) were edited by A. Fréson. See an article by A. Fréson in the *Biographie nationale de Belgique*; and T. Juste, *Joseph Lebeau* (Brussels, 1865).

LEBEL, JEAN (d. 1370), Belgian chronicler, was born near the end of the 13th century. His father, Gilles le Beal des Changes, was an alderman of Liége. Jean entered the church and became a canon of the cathedral church, but he and his brother Henri followed Jean de Beaumont to England in 1327, and took part in the border warfare against the Scots. His will is dated 1369, and his epitaph gives the date of his death as 1370. Nothing more is known of his life, but Jacques de Hemricourt, author of the *Miroir des nobles de Hesbaye*, has left a eulogy of his character, and a description of the magnificence of his attire, his retinue and his hospitality. Hemricourt asserts that he was eighty years old or more when he died. For a long time Jean Lebel (or le Bel) was only known as a chronicler through a reference by Froissart, who quotes him in the prologue of his first book as one of his authorities. A fragment of his work, in the MS. of Jean d'Outremeuse's *Mireur des istores*, was discovered in 1847; and the whole of his chronicle, preserved in the library of Châlons-sur-Marne, was edited in 1863 by L. Polain. Jean Lebel gives as his reason for writing a desire to replace a certain misleading rhymed chronicle of the wars of Edward III. by a true relation of his enterprises down to the beginning of the Hundred Years' War. In the matter of style Lebel has been placed by some critics on the level of Froissart. His chief merit is his refusal to narrate events unless either he himself or his informant had witnessed them. This scrupulousness in the acceptance of evidence must be set against his limitations. He takes on the whole a similar point of view to Froissart's; he has no concern with national movements or politics; and, writing for the public of chivalry, he preserves no general notion of a campaign, which resolves itself in his narrative into a series of exploits on the part of his heroes. Froissart was considerably indebted to him, and seems to have borrowed from him some of his best-known episodes, such as the death of Robert the Bruce, Edward III. and the countess of Salisbury, and the devotion of the burghers of Calais. The songs and virelais, in the art of writing which he was, according to Hemricourt, an expert, have not come to light.



See L. Polain, *Les Vraies Chroniques de messire Jehan le Bel* (1863); Kervyn de Lettenhove, *Bulletin de la société d'émulation de Bruges*, series ii. vols. vii. and ix.; and H. Pirenne in *Biographie nationale de Belgique*.

LEBER, JEAN MICHEL CONSTANT (1780-1859), French historian and bibliophile, was born at Orléans on the 8th of May 1780. His first work was a poem on Joan of Arc (1804); but he wrote at the same time a *Grammaire général synthétique*, which

attracted the attention of J. M. de Gérando, then secretary-general to the ministry of the interior. The latter found him a minor post in his department, which left him leisure for his historical work. He even took him to Italy when Napoleon was trying to organize, after French models, the Roman states which he had taken from the pope in 1809. Leber however did not stay there long, for he considered the attacks on the temporal property of the Holy See to be sacrilegious. On his return to Paris he resumed his administrative work, literary recreations and historical researches. While spending a part of his time writing vaudevilles and comic operas, he began to collect old essays and rare pamphlets by old French historians. His office was preserved to him by the Restoration, and Leber put his literary gifts at the service of the government. When the question of the coronation of Louis XVIII. arose, he wrote, as an answer to Volney, a minute treatise on the *Cérémonies du sacre*, which was published at the time of the coronation of Charles X. Towards the end of Villèle's ministry, when there was a movement of public opinion in favour of extending municipal liberties, he undertook the defence of the threatened system of centralization, and composed, in answer to Raynouard, an *Histoire critique du pouvoir municipal depuis l'origine de la monarchie jusqu'à nos jours* (1828). He also wrote a treatise entitled *De l'état réel de la presse et des pamphlets depuis François I^er^ jusqu'à Louis XIV.*, in which he refuted an empty paradox of Charles Nodier, who had tried to prove that the press had never been, and could never be, so free as under the Grand Monarch. A few years later, Leber retired (1839), and sold to the library of Rouen the rich collection of books which he had amassed during thirty years of research. The catalogue he made himself (4 vols., 1839 to 1852). In 1840 he read at the Académie des Inscriptions et Belles-Lettres two dissertations, an "Essai sur l'appréciation de la fortune privée au moyen âge," followed by an "Examen critique des tables de prix du marc d'argent depuis l'époque de Saint Louis"; these essays were included by the Academy in its *Recueil de mémoires présentés par divers savants* (vol. i., 1844), and were also revised and published by Leber (1847). They form his most considerable work, and assure him a position of eminence in the economic history of France. He also rendered good service to historians by the publication of his *Collection des meilleures dissertations, notices et traités relatifs à l'histoire de France* (20 vols., 1826-1840); in the absence of an index, since Leber did not give one, an analytical table of contents is to be found in Alfred Franklin's *Sources de l'histoire de France* (1876, pp. 342 sqq.). In consequence of the revolution of 1848, Leber decided to leave Paris. He retired to his native town, and spent his last years in collecting old engravings. He died at Orléans on the 22nd of December 1859.

In 1832 he had been elected as a member of the *Société des Antiquaires de France*, and in the *Bulletin* of this society (vol. i., 1860) is to be found the most correct and detailed account of his life's works.

LEBEUF, JEAN (1687-1760), French historian, was born on the 7th of March 1687 at Auxerre, where his father, a councillor in the parlement, was *receveur des consignations*. He began his studies in his native town, and continued them in Paris at the Collège Ste Barbe. He soon became known as one of the most cultivated minds of his time. He made himself master of practically every branch of medieval learning, and had a thorough knowledge of the sources and the bibliography of his subject. His learning was not drawn from books only; he was also an archaeologist, and frequently went on expeditions in France, always on foot, in the course of which he examined the monuments of architecture and sculpture, as well as the libraries, and collected a number of notes and sketches. He was in correspondence with all the most learned men of the day. His correspondence with Président Bouhier was published in 1885 by Ernest Petit; his other letters have been edited by the *Société des sciences historiques et naturelles de l'Yonne* (2 vols., 1866-1867). He also wrote numerous articles, and, after his election as a member of the Académie des Inscriptions et Belles-Lettres (1740), a number of *Mémoires* which appeared in the *Recueil* of this society. He died at Paris on the 10th of April 1760. His most important researches had Paris as their subject.

He published first a collection of *Dissertations sur l'histoire civile et ecclésiastique de Paris* (3 vols., 1739-1743), then an *Histoire de la ville et de tout le diocèse de Paris* (15 vols., 1745-1760), which is a mine of information, mostly taken from the original sources. In view of the advance made by scholarship in the 19th century, it was found necessary to publish a second edition. The work of reprinting it was undertaken by H. Cocheris, but was

interrupted (1863) before the completion of vol. iv. Adrien Augier resumed the work, giving Lebeuf's text, though correcting the numerous typographical errors of the original edition (5 vols., 1883), and added a sixth volume containing an analytical table of contents. Finally, Fernand Bournon completed the work by a volume of *Rectifications et additions* (1890), worthy to appear side by side with the original work.

The bibliography of Lebeuf's writings is, partly, in various numbers of the *Bibliothèque des écrivains de Bourgogne* (1716-1741). His biography is given by Lebeau in the *Histoire de l'Académie royale des Inscriptions* (xxix., 372, published 1764), and by H. Cocheris, in the preface to his edition.

LE BLANC, NICOLAS (1742-1806), French chemist, was born at Issoudun, Indre, in 1742. He made medicine his profession and in 1780 became surgeon to the duke of Orleans, but he also paid much attention to chemistry. About 1787 he was attracted to the urgent problem of manufacturing carbonate of soda from ordinary sea-salt. The suggestion made in 1789 by Jean Claude de la Métherie (1743-1817), the editor of the *Journal de physique*, that this might be done by calcining with charcoal the sulphate of soda formed from salt by the action of oil of vitriol, did not succeed in practice because the product was almost entirely sulphide of soda, but it gave Le Blanc, as he himself acknowledged, a basis upon which to work. He soon made the crucial discovery—which proved the foundation of the huge industry of artificial alkali manufacture—that the desired end was to be attained by adding a proportion of chalk to the mixture of charcoal and sulphate of soda. Having had the soundness of this method tested by Jean Darcet (1725-1801), the professor of chemistry at the Collège de France, the duke of Orleans in June 1791 agreed to furnish a sum of 200,000 francs for the purpose of exploiting it. In the following September Le Blanc was granted a patent for fifteen years, and shortly afterwards a factory was started at Saint-Denis, near Paris. But it had not long been in operation when the Revolution led to the confiscation of the duke's property, including the factory, and about the same time the Committee of Public Safety called upon all citizens who possessed soda-factories to disclose their situation and capacity and the nature of the methods employed. Le Blanc had no choice but to reveal the secrets of his process, and he had the misfortune to see his factory dismantled and his stocks of raw and finished materials sold. By way of compensation for the loss of his rights, the works were handed back to him in 1800, but all his efforts to obtain money enough to restore them and resume manufacturing on a profitable scale were vain, and, worn out with disappointment, he died by his own hand at Saint-Denis on the 16th of January 1806.



Four years after his death, Michel Jean Jacques Dizê (1764-1852), who had been *préparateur* to Darcet at the time he examined the process and who was subsequently associated with Le Blanc in its exploitation, published in the *Journal de physique* a paper claiming that it was he himself who had first suggested the addition of chalk; but a committee of the French Academy, which reported fully on the question in 1856, came to the conclusion that the merit was entirely Le Blanc's (*Com. rend.*, 1856, p. 553).

LE BLANC, a town of central France, capital of an arrondissement, in the department of Indre, 44 m. W.S.W, of Châteauroux on the Orléans railway between Argenton and Poitiers. Pop. (1906) 4719. The Creuse divides it into a lower and an upper town. The church of St Génitour dates from the 12th, 13th and 15th centuries, and there is an old castle restored in modern times. It is the seat of a subprefect, and has a tribunal of first instance and a communal college. Wool-spinning, and the manufacture of linen goods and edge-tools are among the industries. There is trade in horses and in the agricultural and other products of the surrounding region.

Le Blanc, which is identified with the Roman *Oblincum*, was in the middle ages a lordship

belonging to the house of Naillac and a frontier fortress of the province of Berry.

LEBŒUF, EDMOND (1809-1888), marshal of France, was born at Paris on the 5th of November 1809, passed through the École Polytechnique and the school of Metz, and distinguished himself as an artillery officer in Algerian warfare, becoming colonel in 1852. He commanded the artillery of the 1st French corps at the siege of Sebastopol, and was promoted in 1854 to the rank of general of brigade, and in 1857 to that of general of division. In the Italian War of 1859 he commanded the artillery, and by his action at Solferino materially assisted in achieving the victory. In September 1866, having in the meantime become aide-de-camp to Napoleon III., he was despatched to Venetia to hand over that province to Victor Emmanuel. In 1869, on the death of Marshal Niel, General Lebœuf became minister of war, and earned public approbation by his vigorous reorganization of the War Office and the civil departments of the service. In the spring of 1870 he received the marshal's baton. On the declaration of war with Germany Marshal Lebœuf delivered himself in the Corps Législatif of the historic saying, "So ready are we, that if the war lasts two years, not a gaiter button would be found wanting." It may be that he intended this to mean that, given time, the reorganization of the War Office would be perfected through experience, but the result inevitably caused it to be regarded as a mere boast, though it is now known that the administrative confusion on the frontier in July 1870 was far less serious than was supposed at the time. Lebœuf took part in the Lorraine campaign, at first as chief of staff (major-general) of the Army of the Rhine, and afterwards, when Bazaine became commander-in-chief, as chief of the III. corps, which he led in the battles around Metz. He distinguished himself, whenever engaged, by personal bravery and good leadership. Shut up with Bazaine in Metz, on its fall he was confined as a prisoner in Germany. On the conclusion of peace he returned to France and gave evidence before the commission of inquiry into the surrender of that stronghold, when he strongly denounced Bazaine. After this he retired into private life to the Château du Moncel near Argentan, where he died on the 7th of June 1888.

LE BON, JOSEPH (1765-1795), French politician, was born at Arras on the 29th of September 1765. He became a priest in the order of the Oratory, and professor of rhetoric at Beaune. He adopted revolutionary ideas, and became a curé of the Constitutional Church in the department of Pas-de-Calais, where he was later elected as a *député suppléant* to the Convention. He became *maire* of Arras and *administrateur* of Pas-de-Calais, and on the 2nd of July 1793 took his seat in the Convention. He was sent as a representative on missions into the departments of the Somme and Pas-de-Calais, where he showed great severity in dealing with offences against revolutionaries (8th Brumaire, year II. to 22nd Messidor, year II.; *i.e.* 29th October 1793 to 10th July 1794). In consequence, during the reaction which followed the 9th Thermidor (27th July 1794) he was arrested on the 22nd Messidor, year III. (10th July 1795). He was tried before the criminal tribunal of the Somme, condemned to death for abuse of his power during his mission, and executed at Amiens on the 24th Vendémiaire in the year IV. (10th October 1795). Whatever Le Bon's offences, his condemnation was to a great extent due to the violent attacks of one of his political enemies, Armand Guffroy; and it is only just to remember that it was owing to his courage that Cambrai was saved from falling into the hands of the Austrians.

His son, Émile le Bon, published a *Histoire de Joseph le Bon et des tribunaux révolutionnaires d'Arras et de Cambrai* (2nd ed., 2 vols., Arras, 1864).

LEBRIJA, or Lebrixa, a town of southern Spain, in the province of Seville, near the left bank of the Guadalquivir, and on the eastern edge of the marshes known as Las Marismas. Pop. (1900) 10,997. Lebrija is 44 m. S. by W. of Seville, on the Seville-Cadiz railway. Its chief buildings are a ruined Moorish castle and the parish church, an imposing structure in a variety of styles—Moorish, Gothic, Romanesque—dating from the 14th century to the 16th, and containing some early specimens of the carving of Alonso Cano (1601-1667). There are manufactures of bricks, tiles and earthenware, for which clay is found in the neighbourhood; and some trade in grain, wine and oil.

Lebrija is the *Nabrissa* or *Nebrissa*, surnamed *Veneria*, of the Romans; by Silius Italicus (iii. 393), who connects it with the worship of Dionysus, the name is derived from the Greek νεβρίς (a "fawn-skin," associated with Dionysiac ritual). *Nebrishah* was a strong and populous place during the period of Moorish domination (from 711); it was taken by St Ferdinand in 1249, but again lost, and became finally subject to the Castilian crown only under Alphonso the Wise in 1264. It was the birthplace of Elio Antonio de Lebrija or Nebrija (1444-1522), better known as Nebrissensis, one of the most important leaders in the revival of learning in Spain, the tutor of Queen Isabella, and a collaborator with Cardinal Jimenes in the preparation of the Complutensian Polyglot (see Alcala de Henares).

LE BRUN, CHARLES (1619-1690), French painter, was born at Paris on the 24th of February 1619, and attracted the notice of Chancellor Séguier, who placed him at the age of eleven in the studio of Vouet. At fifteen he received commissions from Cardinal Richelieu, in the execution of which he displayed an ability which obtained the generous commendations of Poussin, in whose company Le Brun started for Rome in 1642. In Rome he remained four years in the receipt of a pension due to the liberality of the chancellor. On his return to Paris Le Brun found numerous patrons, of whom Superintendent Fouquet was the most important. Employed at Vaux le Vicomte, Le Brun ingratiated himself with Mazarin, then secretly pitting Colbert against Fouquet. Colbert also promptly recognized Le Brun's powers of organization, and attached him to his interests. Together they founded the Academy of Painting and Sculpture (1648), and the Academy of France at Rome (1666), and gave a new development to the industrial arts. In 1660 they established the Gobelins, which at first was a great school for the manufacture, not of tapestries only, but of every class of furniture required in the royal palaces. Commanding the industrial arts through the Gobelins—of which he was director—and the whole artist world through the Academy—in which he successively held every post—Le Brun imprinted his own character on all that was produced in France during his lifetime, and gave a direction to the national tendencies which endured after his death. The nature of his emphatic and pompous talent was in harmony with the taste of the king, who, full of admiration at the decorations designed by Le Brun for his triumphal entry into Paris (1660), commissioned him to execute a series of subjects from the history of Alexander. The first of these, "Alexander and the Family of Darius," so delighted Louis XIV. that he at once ennobled Le Brun (December, 1662), who was also created first painter to his majesty with a pension of 12,000 livres, the same amount as he had yearly received in the service of the magnificent Fouquet. From this date all that was done in the royal palaces was directed by Le Brun. The works of the gallery of Apollo in the Louvre were interrupted in 1677 when he accompanied the king to Flanders (on his return from Lille he painted several compositions in the Château of St Germains), and finally—for they remained unfinished at his death—by the vast labours of Versailles, where he reserved for himself the Halls of War and Peace, the Ambassadors' Staircase, and the Great Gallery, other artists being forced to accept the position of his assistants. At the death of Colbert, Louvois, who succeeded him in the department of public works, showed no favour to Le Brun, and in spite of the king's continued support he felt a bitter change in his position. This contributed to the illness which on the 22nd of February 1690 ended in his death in the Gobelins. Besides his gigantic labours at Versailles and the Louvre, the number of his works for religious corporations and private patrons is enormous. He modelled and

engraved with much facility, and, in spite of the heaviness and poverty of drawing and colour, his extraordinary activity and the vigour of his conceptions justify his claim to fame. Nearly all his compositions have been reproduced by celebrated engravers.

**LEBRUN, CHARLES FRANÇOIS,** duc de Plaisance (1739-1824), French statesman, was born at St-Sauveur-Lendelin (Manche) on the 19th of March 1739, and in 1762 made his first appearance as a lawyer at Paris. He filled the posts successively of *censeur royale* (1766) and of inspector general of the domains of the crown (1768); he was also one of the chief advisers of the chancellor Maupeou, took part in his struggle against the parlements, and shared in his downfall in 1774. He then devoted himself to literature, translating Tasso's *Gerusalemme liberata* (1774), and the *Iliad* (1776). At the outset of the Revolution he foresaw its importance, and in the *Voix du citoyen*, which he published in 1789, predicted the course which events would take. In the Constituent Assembly, where he sat as deputy for Dourdan, he professed liberal views, and was the proposer of various financial laws. He then became president of the directory of Seine-et-Oise, and in 1795 was elected as a deputy to the Council of Ancients. After the *coup d'état* of the 18th Brumaire in the year VIII. (9th November 1799), Lebrun was made third consul. In this capacity he took an active part in the reorganization of finance and of the administration of the departments of France. In 1804 he was appointed arch-treasurer of the empire, and in 1805-1806 as governor-general of Liguria effected its annexation to France. He opposed Napoleon's restoration of the noblesse, and in 1808 only reluctantly accepted the title of duc de Plaisance (Piacenza). He was next employed in organizing the departments which were formed in Holland, of which he was governor-general from 1811 to 1813. Although to a certain extent opposed to the despotism of the emperor, he was not in favour of his deposition, though he accepted the *fait accompli* of the Restoration in April 1814. Louis XVIII. made him a peer of France; but during the Hundred Days he accepted from Napoleon the post of Grand Master of the university. On the return of the Bourbons in 1815 he was consequently suspended from the House of Peers, but was recalled in 1819. He died at St Mesmes (Seine-et-Oise) on the 16th of June 1824. He had been made a member of the Académie des Inscriptions et Belles-Lettres in 1803.

See M. de Caumont la Force, *L'Architrésorier Lebrun* (Paris, 1907); M. Marie du Mesnil, *Mémoire sur le prince Le Brun, duc de Plaisance* (Paris, 1828); *Opinions, rapports et choix d'écrits politiques de C. F. Lebrun* (1829), edited, with a biographical notice, by his son Anne-Charles Lebrun.

**LEBRUN, PIERRE ANTOINE** (1785-1873), French poet, was born in Paris on the 29th of November 1785. An *Ode à la grande armée*, mistaken at the time for the work of Écouchard Lebrun, attracted Napoleon's attention, and secured for the author a pension of 1200 francs. Lebrun's plays, once famous, are now forgotten. They are: *Ulysse* (1814), *Marie Stuart* (1820), which obtained a great success, and *Le Cid d'Andalousie* (1825). Lebrun visited Greece in 1820, and on his return to Paris he published in 1822 an ode on the death of Napoleon which cost him his pension. In 1825 he was the guest of Sir Walter Scott at Abbotsford. The coronation of Charles X. in that year inspired the verses entitled *La Vallée de Champrosay*, which have, perhaps, done more to secure his fame than his more ambitious attempts. In 1828 appeared his most important poem, *La Grèce*, and in the same year he was elected to the Academy. The revolution of 1830 opened up for him a public career; in 1831 he was made director of the Imprimerie Royale, and subsequently filled with distinction other public offices, becoming senator in 1853. He died on the 27th of May 1873.

See Sainte-Beuve, *Portraits contemporains*, vol. ii.

LEBRUN, PONCE DENIS ÉCOUCHARD (1729-1807), French lyric poet, was born in Paris on the 11th of August 1729, in the house of the prince de Conti, to whom his father was valet. Young Lebrun had among his schoolfellows a son of Louis Racine whose disciple he became. In 1755 he published an *Ode sur les désastres de Lisbon*. In 1759 he married Marie Anne de Surcourt, addressed in his *Élégies* as Fanny. To the early years of his marriage belongs his poem *Nature*. His wife suffered much from his violent temper, and when in 1774 she brought an action against him to obtain a separation, she was supported by Lebrun's own mother and sister. He had been *secrétaire des commandements* to the prince de Conti, and on his patron's death was deprived of his occupation. He suffered a further misfortune in the loss of his capital by the bankruptcy of the prince de Guémené. To this period belongs a long poem, the *Veillées des Muses*, which remained unfinished, and his ode to Buffon, which ranks among his best works. Dependent on government pensions he changed his politics with the times. Calonne he compared to the great Sully, and Louis XVI. to Henry IV., but the Terror nevertheless found in him its official poet. He occupied rooms in the Louvre, and fulfilled his obligations by shameless attacks on the unfortunate king and queen. His excellent ode on the *Vengeur* and the *Ode nationale contre Angleterre* on the occasion of the projected invasion of England are in honour of the power of Napoleon. This "versatility" has so much injured Lebrun's reputation that it is difficult to appreciate his real merit. He had a genius for epigram, and the quatrains and dizaines directed against his many enemies have a verve generally lacking in his odes. The one directed against La Harpe is called by Sainte-Beuve the "queen of epigrams." La Harpe has said that the poet, called by his friends, perhaps with a spice of irony, Lebrun-Pindare, had written many fine strophes but not one good ode. The critic exposed mercilessly the obscurities and unlucky images which occur even in the ode to Buffon, and advised the author to imitate the simplicity and energy that adorned Buffon's prose. Lebrun died in Paris on the 31st of August 1807.

His works were published by his friend P. L. Ginguené in 1811. The best of them are included in Prosper Poitevin's "*Petits poètes français*," which forms part of the "*Panthéon littéraire*."

LE CARON, HENRI (whose real name was Thomas Miller Beach) (1841-1894), British secret service agent, was born at Colchester, on the 26th of September 1841. He was of an adventurous character, and when nineteen years old went to Paris, where he found employment in business connected with America. Infected with the excitement of the American Civil War, he crossed the Atlantic in 1861 and enlisted in the Northern army, taking the name of Henri Le Caron. In 1864 he married a young lady who had helped him to escape from some Confederate marauders; and by the end of the war he rose to be major. In 1865, through a companion in arms named O'Neill, he was brought into contact with Fenianism, and having learnt of the Fenian plot against Canada, he mentioned the designs when writing home to his father. Mr Beach told his local M.P., who in turn told the Home Secretary, and the latter asked Mr Beach to arrange for further information. Le Caron, inspired (as all the evidence shows) by genuinely patriotic feeling, from that time till 1889 acted for the British government as a paid military spy. He was a proficient in medicine, among other qualifications for this post, and he remained for years on intimate terms with the most extreme men in the Fenian organization under all its forms. His services enabled the British government to take measures which led to the fiasco of the Canadian invasion of 1870 and Riel's surrender in 1871, and he supplied full details concerning the various Irish-American associations, in which he himself was a prominent member. He was in the secrets of the "new departure" in 1879-1881, and in the latter year had an interview with Parnell at the House of Commons, when the Irish leader spoke sympathetically of an armed revolution in Ireland. For twenty-five years he lived at Detroit and other places in America, paying

occasional visits to Europe, and all the time carrying his life in his hand. The Parnell Commission of 1889 put an end to this. Le Caron was subpoenaed by *The Times*, and in the witness-box the whole story came out, all the efforts of Sir Charles Russell in cross-examination failing to shake his testimony, or to impair the impression of iron tenacity and absolute truthfulness which his bearing conveyed. His career, however, for good or evil, was at an end. He published the story of his life, *Twenty-five Years in the Secret Service*, and it had an immense circulation. But he had to be constantly guarded, his acquaintances were hampered from seeing him, and he was the victim of a painful disease, of which he died on the 1st of April 1894. The report of the Parnell Commission is his monument.

LE CATEAU, or Cateau-Cambrésis, a town of northern France, in the department of Nord, on the Selle, 15 m. E.S.E. of Cambrai by road. Pop. (1906) 10,400. A church of the early 17th century and a town-hall in the Renaissance style are its chief buildings. Its institutions include a board of trade-arbitration and a communal college, and its most important industries are wool-spinning and weaving. Formed by the union of the two villages of Péronne and Vendelgies, under the protection of a castle built by the bishop of Cambrai, Le Cateau became the seat of an abbey in the 11th century. In the 15th it was frequently taken and retaken, and in 1556 it was burned by the French, who in 1559 signed a celebrated treaty with Spain in the town. It was finally ceded to France by the peace of Nijmwegen in 1678.

LECCE (anc. *Lupiae*), a town and archiepiscopal see of Apulia, Italy, capital of the province of Lecce, 24 m. S.E. of Brindisi by rail. Pop. (1906) 35,179. The town is remarkable for the number of buildings of the 17th century, in the rococo style, which it contains; among these are the cathedral of S. Oronzo, and the churches of S. Chiara, S. Croce, S. Domenico, &c., the Seminario, and the Prefettura (the latter contains a museum, with a collection of Greek vases, &c.). Buildings of an earlier period are not numerous, but the fine portal of the Romanesque church of SS. Nicola e Cataldo, built by Tancred in 1180, may be noted. Another old church is S. Maria di Cerrate, near the town. Lecce contains a large government tobacco factory, and is the centre of a fertile agricultural district. To the E. 7½ m. is the small harbour of S. Cataldo, reached by electric tramway. Lecce is quite close to the site of the ancient Lupiae, equidistant (25 m.) from Brundusium and Hydruntum, remains of which are mentioned as existing up to the 15th century. A colony was founded there in Roman times, and Hadrian made a harbour—no doubt at S. Cataldo. Hardly a mile west was Rudiae, the birthplace of the poet Ennius, spoken of by Silius Italicus as worthy of mention for that reason alone. Its site was marked by the now deserted village of Rugge. The name Lycea, or Lycia, begins to appear in the 6th century. The city was for some time held by counts of Norman blood, among whom the most noteworthy is Bohemond, son of Robert Guiscard. It afterwards passed to the Orsini. The rank of provincial capital was bestowed by Ferdinand of Aragon in acknowledgment of the fidelity of Lecce to his cause.

(T. As.)

See M. S. Briggs, *In the Heel of Italy* (1910).

LECCO, a town of Lombardy, in the province of Como, 32 m. by rail N. by E. of Milan, and reached by steamer from Como, 673 ft. above sea-level. Pop. (1901) 10,352. It is situated near the southern extremity of the eastern branch of the Lake of Como, which is frequently distinguished as the Lake of Lecco. At Lecco begins the line (run by electricity) to Colico, whence there are branches to Chiavenna and Sondrio; and another line runs to Bergamo. To the south the Adda is crossed by a fine bridge originally constructed in 1335, and rebuilt in 1609 by Fuentes. Lecco, in spite of its antiquity, presents a modern appearance, almost the only old building being its castle, of which a part remains. Its schools are particularly good. Besides iron-works, there are copper-works, brass-foundries, olive-oil mills and a manufacture of wax candles; and silk-spinning, cotton-spinning and wood-carving. In the neighbourhood is the villa of Caleotto, the residence of Alessandro Manzoni, who in his *Promessi Sposi*, has left a full description of the district. A statue has been erected to him.

In the 11th century Lecco, previously the seat of a marquisate, was presented to the bishops of Como by Otto II.; but in the 12th century it passed to the archbishops of Milan, and in 1127 it assisted the Milanese in the destruction of Como. During the 13th century it was struggling for its existence with the metropolitan city; and its fate seemed to be sealed when the Visconti drove its inhabitants across the lake to Valmadrera, and forbade them to raise their town from its ashes. But in a few years the people returned; Azzone Visconti made Lecco a strong fortress, and in 1335 united it with the Milanese territory by a bridge across the Adda. During the 15th and 16th centuries the citadel of Lecco was an object of endless contention. In 1647 the town with its territory was made a countship. Morone, Charles V.'s Italian chancellor, was born in Lecco.

See A. L. Apostolo, *Lecco ed il suo territorio* (Lecco, 1855).

LECH (*Licus*), a river of Germany in the kingdom of Bavaria, 177 m. long, with a drainage basin of 2550 sq. m. It rises in the Vorarlberg Alps, at an altitude of 6120 ft. It winds out of the gloomy limestone mountains, flows in a north-north-easterly direction, and enters the plains at Füssen (2580 ft.), where it forms rapids and a fall, then pursues a northerly course past Augsburg, where it receives the Wertach, and joins the Danube from the right just below Donauwörth (1330 ft.). It is not navigable, owing to its torrential character and the gravel beds which choke its channel. More than once great historic events have been decided upon its banks. On the Lechfeld, a stony waste some miles long, between the Lech and the Wertach, the emperor Otto I. defeated the Hungarians in August 955. Tilly, in attempting to defend the passage of the stream at Rain against the forces of Gustavus Adolphus, was fatally wounded, on the 5th of April 1632. The river was formerly the boundary between Bavaria and Swabia.

LE CHAMBON, or Le Chambon-Feugerolles, a town of east-central France in the department of Loire, 7½ m. S.W. of St Étienne by rail, on the Ondaine, a tributary of the Loire. Pop. (1906) town, 7525; commune, 12,011. Coal is mined in the neighbourhood, and there are forges, steel works, manufactures of tools and other iron goods, and silk mills. The feudal castle of Feugerolles on a hill to the south-east dates in part from the 11th century.

Between Le Chambon and St Étienne is La Ricamarie (pop. of town 5289) also of importance for its coal-mines. Many of the galleries of a number of these mines are on fire, probably from spontaneous combustion. According to popular tradition these fires date from the time of the Saracens; more authentically from the 15th century.

**LE CHAPELIER, ISAAC RENÉ GUY** (1754-1794), French politician, was born at Rennes on the 12th of June 1754, his father being *bâtonnier* of the corporation of lawyers in that town. He entered his father's profession, and had some success as an orator. In 1789 he was elected as a deputy to the States General by the Tiers-État of the *sénéchaussée* of Rennes. He adopted advanced opinions, and was one of the founders of the Breton Club (see JACOBIN CLUB); his influence in the Constituent Assembly was considerable, and on the 3rd of August 1789 he was elected its president. Thus he presided over the Assembly during the important period following the 4th of August; he took an active part in the debates, and was a leading member of the committee which drew up the new constitution; he further presented a report on the liberty of theatres and on literary copyright. He was also conspicuous as opposing Robespierre when he proposed that members of the Constituent Assembly should not be eligible for election to the proposed new Assembly. After the flight of the king to Varennes (20th of June 1792), his opinions became more moderate, and on the 29th of September he brought forward a motion to restrict the action of the clubs. This, together with a visit which he paid to England in 1792 made him suspect, and he was denounced on his return for conspiring with foreign nations. He went into hiding, but was discovered in consequence of a pamphlet which he published to defend himself, arrested and condemned to death by the Revolutionary Tribunal. He was executed at Paris on the 22nd of April 1794.



See A. Aulard, *Les Orateurs de la constituante* (2nd ed., Paris, 1905); R. Kerviler, *Récherches et notices sur les députés de la Bretagne aux états généraux* (2 vols., Rennes, 1888-1889); P. J. Levot, *Biographie bretonne* (2 vols., 1853-1857).

**LECHLER, GOTTHARD VICTOR** (1811-1888), German Lutheran theologian, was born on the 18th of April 1811 at Kloster Reichenbach in Württemberg. He studied at Tübingen under F. C. Baur, and became in 1858 pastor of the church of St Thomas, professor Ordinarius of historical theology and superintendent of the Lutheran church of Leipzig. He died on the 26th of December 1888. A disciple of Neander, he belonged to the extreme right of the school of mediating theologians. He is important as the historian of early Christianity and of the pre-Reformation period. Although F. C. Baur was his teacher, he did not attach himself to the Tübingen school; in reply to the contention that there are traces of a sharp conflict between two parties, Paulinists and Petrinists, he says that "we find variety coupled with agreement, and unity with difference, between Paul and the earlier apostles; we recognize the one spirit in the many gifts." His *Das apostolische und das nachapostolische Zeitalter* (1851), which developed out of a prize essay (1849), passed through three editions in Germany (3rd ed., 1885), and was translated into English (2 vols., 1886). The work which in his own opinion was his greatest, *Johann von Wiclif und die Vorgeschichte der Reformation* (2 vols., 1873), appeared in English with the title *John Wiclif and his English Precursors* (1878, new ed., 1884). An earlier work, *Geschichte des engl. Deïsmus* (1841), is still regarded as a valuable contribution to the study of religious thought in England.

Lechler's other works include *Geschichte der Presbyterial- und Synodal-verfassung* (1854), *Urkundenfunde zur Geschichte des christl. Altertums* (1886), and biographies of Thomas Bradwardine (1862) and Robert Grosseteste (1867). He wrote part of the commentary on the Acts of the Apostles in J. P. Lange's *Bibelwerk*. From 1882 he edited with F. W. Dibelius the *Beiträge zur sächsischen Kirchengeschichte*. *Johannes Hus* (1890) was published after his death.

LECKY, WILLIAM EDWARD HARTPOLE (1838-1903), Irish historian and publicist, was born at Newtown Park, near Dublin, on the 26th of March 1838, being the eldest son of John Hartpole Lecky, whose family had for many generations been landowners in Ireland. He was educated at Kingstown, Armagh, and Cheltenham College, and at Trinity College, Dublin, where he graduated B.A. in 1859 and M.A. in 1863, and where, with a view to becoming a clergyman in the Irish Protestant Church, he went through a course of divinity. In 1860 he published anonymously a small book entitled *The Religious Tendencies of the Age*, but on leaving college he abandoned his first intention and turned to historical work. In 1861 he published *Leaders of Public Opinion in Ireland*, a brief sketch of the lives and work of Swift, Flood, Grattan and O'Connell, which gave decided promise of his later admirable work in the same field. This book, originally published anonymously, was republished in 1871; and the essay on Swift, rewritten and amplified, appeared again in 1897 as an introduction to a new edition of Swift's works. Two learned surveys of certain aspects of history followed: *A History of the Rise and Influence of Rationalism in Europe* (2 vols., 1865), and *A History of European Morals from Augustus to Charlemagne* (2 vols., 1869). Some criticism was aroused by these books, especially by the last named, with its opening dissertation on "the natural history of morals," but both have been generally accepted as acute and suggestive commentaries upon a wide range of facts. Lecky then devoted himself to the chief work of his life, *A History of England during the Eighteenth Century*, vols. i. and ii. of which appeared in 1878, and vols. vii. and viii. (completing the work) in 1890. His object was "to disengage from the great mass of facts those which relate to the permanent forces of the nation, or which indicate some of the more enduring features of national life," and in the carrying out of this task Lecky displays many of the qualities of a great historian. The work is distinguished by the lucidity of its style, but the fulness and extent of the authorities referred to, and, above all, by the judicial impartiality maintained by the author throughout. These qualities are perhaps most conspicuous and most valuable in the chapters which deal with the history of Ireland, and in the cabinet edition of 1892, in 12 vols. (frequently reprinted) this part of the work is separated from the rest, and occupies five volumes under the title of *A History of Ireland in the Eighteenth Century*. A volume of *Poems*, published in 1891, was characterized by a certain frigidity and by occasional lapses into commonplace, objections which may also be fairly urged against much of Lecky's prose-writing. In 1896 he published two volumes entitled *Democracy and Liberty*, in which he considered, with special reference to Great Britain, France and America, some of the tendencies of modern democracies. The somewhat gloomy conclusions at which he arrived provoked much criticism both in Great Britain and America, which was renewed when he published in a new edition (1899) an elaborate and very depreciatory estimate of Gladstone, then recently dead. This work, though essentially different from the author's purely historical writings, has many of their merits, though it was inevitable that other minds should take a different view of the evidence. In *The Map of Life* (1900) he discussed in a popular style some of the ethical problems which arise in everyday life. In 1903 he published a revised and greatly enlarged edition of *Leaders of Public Opinion in Ireland*, in two volumes, from which the essay on Swift was omitted and that on O'Connell was expanded into a complete biography of the great advocate of repeal of the Union. Though always a keen sympathizer with the Irish people in their misfortunes and aspirations, and though he had criticized severely the methods by which the Act of Union was passed, Lecky, who grew up as a moderate Liberal, was from the first strenuously opposed to Gladstone's policy of Home Rule, and in 1895 he was returned to parliament as Unionist member for Dublin University. In 1897 he was made a privy councillor, and among the coronation honours in 1902 he was nominated an original member of the new Order of Merit. His university honours included the degree of LL.D. from Dublin, St Andrews and Glasgow, the degree of D.C.L. from Oxford and the degree of Litt.D. from Cambridge. In 1894 he was elected corresponding member of the Institute of France. He contributed occasionally to periodical literature, and two of his addresses, *The Political Value of History* (1892) and *The Empire, its Value and its Growth* (1893), were published. He died in London on the 22nd of October 1903. He married in 1871 Elizabeth, baroness de Dedem, daughter of baron de Dedem, a general in the Dutch service, but had no children. Mrs Lecky contributed to various reviews a number of articles, chiefly on historical and political subjects. A volume of Lecky's

*Historical and Political Essays* was published posthumously (London, 1908).

LE CLERC [Clericus], JEAN (1657-1736), French Protestant theologian, was born on the 19th of March 1657 at Geneva, where his father, Stephen Le Clerc, was professor of Greek. The family originally belonged to the neighbourhood of Beauvais in France, and several of its members acquired some name in literature. Jean Le Clerc applied himself to the study of philosophy under J. R. Chouet (1642-1731) the Cartesian, and attended the theological lectures of P. Mestrezat, Franz Turretin and Louis Tronchin (1629-1705). In 1678-1679 he spent some time at Grenoble as tutor in a private family; on his return to Geneva he passed his examinations and received ordination. Soon afterwards he went to Saumur, where in 1679 were published *Liberii de Sancto Amore Epistolae Theologicae* (Irenopoli: Typis Philalethianis), usually attributed to him; they deal with the doctrine of the Trinity, the hypostatic union of the two natures in Jesus Christ, original sin, and the like, in a manner sufficiently far removed from that of the conventional orthodoxy of the period. In 1682 he went to London, where he remained six months, preaching on alternate Sundays in the Walloon church and in the Savoy chapel. Passing to Amsterdam he was introduced to John Locke and to Philip v. Limborch, professor at the Remonstrant college; the acquaintance with Limborch soon ripened into a close friendship, which strengthened his preference for the Remonstrant theology, already favourably known to him by the writings of his grand-uncle, Stephan Curcellaeus (d. 1645) and by those of Simon Episcopius. A last attempt to live at Geneva, made at the request of relatives there, satisfied him that the theological atmosphere was uncongenial, and in 1684 he finally settled at Amsterdam, first as a moderately successful preacher, until ecclesiastical jealousy shut him out from that career, and afterwards as professor of philosophy, belles-lettres and Hebrew in the Remonstrant seminary. This appointment, which he owed to Limborch, he held from 1684, and in 1712 on the death of his friend he was called to occupy the chair of church history also. His suspected Socinianism was the cause, it is said, of his exclusion from the chair of dogmatic theology. Apart from his literary labours, Le Clerc's life at Amsterdam was uneventful. In 1691 he married a daughter of Gregorio Leti. From 1728 onward he was subject to repeated strokes of paralysis, and he died on the 8th of January 1736.



A full catalogue of the publications of Le Clerc will be found, with biographical material, in E. and E. Haag's *France Protestante* (where seventy-three works are enumerated), or in J. G. de Chauffepié's Dictionnaire. Only the most important of these can be mentioned here. In 1685 he published *Sentimens de quelques théologiens de Hollande sur l'histoire critique du Vieux Testament composée par le P. Richard Simon*, in which, while pointing out what he believed to be the faults of that author, he undertook to make some positive contributions towards a right understanding of the Bible. Among these last may be noted his argument against the Mosaic authorship of the Pentateuch, his views as to the manner in which the five books were composed, his opinions (singularly free for the time in which he lived) on the subject of inspiration in general, and particularly as to the inspiration of Job, Proverbs, Ecclesiastes, Canticles. Richard Simon's *Réponse* (1686) elicited from Le Clerc a *Défense des sentimens* in the same year, which was followed by a new *Réponse* (1687). In 1692 appeared his *Logica sive Ars Ratiocinandi*, and also *Ontologia et Pneumatologia*; these, with the *Physica* (1695), are incorporated with the *Opera Philosophica*, which have passed through several editions. In 1693 his series of Biblical commentaries began with that on Genesis; the series was not completed until 1731. The portion relating to the New Testament books included the paraphrase and notes of Henry Hammond (1605-1660). Le Clerc's commentary had a great influence in breaking up traditional prejudices and showing the necessity for a more scientific inquiry into the origin and meaning of the biblical books. It was on all sides hotly attacked. His *Ars Critica* appeared in 1696, and, in continuation, *Epistolae Criticae et Ecclesiasticae* in 1700. Le Clerc's new edition of the *Apostolic Fathers* of Johann Cotelerius (1627-1686), published in 1698, marked an advance in the critical study of these documents. But the greatest literary influence of Le Clerc was probably that which he exercised over his contemporaries by means of the serials, or, if one may so call them, reviews, of which he was editor. These were the *Bibliothèque universelle et historiqnijkue* (Amsterdam, 25 vols. 12 mo., 1686-1693), begun with J. C. de la Croze; the *Bibliothèque choisie* (Amsterdam, 28 vols., 1703-1713); and the *Bibliothèque ancienne et moderne*, (29 vols., 1714-1726).

See Le Clerc's *Parrhasiana ou pensées sur des matières de critique, d'histoire, de morale, et de politique: avec la défense de divers ouvrages de M. L. C. par Théodore Parrhase* (Amsterdam, 1699); and *Vita et opera ad annum MDCCXI., amici ejus opusculum, philosophicis Clerici operibus subjiciendum*, also attributed to himself. The supplement to Hammond's notes was translated into English in 1699, *Parrhasiana, or Thoughts on Several Subjects*, in 1700, the *Harmony of the Gospels* in 1701, and *Twelve Dissertations out of M. Le Clerc's Genesis* in 1696.

LECOCQ, ALEXANDRE CHARLES (1832- ), French musical composer, was born in Paris, on the 3rd of June 1832. He was admitted into the Conservatoire in 1849, being already an accomplished pianist. He studied under Bazin, Halévy and Benoist, winning the first prize for harmony in 1850, and the second prize for fugue in 1852. He first gained notice by dividing with Bizet the first prize for an operetta in a competition instituted by Offenbach. His operetta, *Le Docteur miracle*, was performed at the Bouffes Parisiens in 1857. After that he wrote constantly for theatres, but produced nothing worthy of mention until *Fleur de thé* (1868), which ran for more than a hundred nights. *Les Cent vierges* (1872) was favourably received also, but all his previous successes were cast into the shade by *La Fille de Madame Angot* (Paris, 1873; London, 1873), which was performed for 400 nights consecutively, and has since gained and retained enormous popularity. After 1873 Lecocq produced a large number of comic operas, though he never equalled his early triumph in *La Fille de Madame Angot*. Among the best of his pieces are *Giroflé-Girofla* (Paris and London, 1874); *Les Prés Saint-Gervais* (Paris and London, 1874); *La Petite Mariée* (Paris, 1875; London, 1876, revived as *The Scarlet Feather*, 1897); *Le Petit Duc* (Paris, 1878; London, as *The Little Duke*, 1878); *La Petite Mademoiselle* (Paris, 1879; London, 1880); *Le Jour et la Nuit* (Paris, 1881; London, as *Manola*, 1882); *Le Cœur et la main* (Paris, 1882; London, as *Incognita*, 1893); *La Princesse des Canaries* (Paris, 1883; London, as *Pepita*, 1888). In 1899 a ballet by Lecocq, entitled *Le Cygne*, was staged at the Opéra Comique, Paris; and in 1903 *Yetta* was produced at Brussels.

LECOINTE-PUYRAVEAU, MICHEL MATHIEU (1764-1827), French politician, was born at Saint-Maixent (Deux-Sèvres) on the 13th of December 1764. Deputy for his department to the Legislative Assembly in 1792, and to the Convention in the same year, he voted for "the death of the tyrant." His association with the Girondins nearly involved him in their fall, in spite of his vigorous republicanism. He took part in the revolution of Thermidor, but protested against the establishment of the Directory, and continually pressed for severer measures against the *émigrés*, and even their relations who had remained in France. He was secretary and then president of the Council of Five Hundred, and under the Consulate a member of the Tribunate. He took no part in public affairs under the Empire, but was lieutenant-general of police for south-east France during the Hundred Days. After Waterloo he took ship from Toulon, but the ship was driven back by a storm and he narrowly escaped massacre at Marseilles. After six weeks' imprisonment in the Château d'If he returned to Paris, escaping, after the proscription of the regicides, to Brussels, where he died on the 15th of January 1827.

**LE CONTE, JOSEPH** (1823-1901), American geologist, of Huguenot descent, was born in Liberty county, Georgia, on the 26th of February 1823. He was educated at Franklin College, Georgia, where he graduated (1841); he afterwards studied medicine and received his degree at the New York College of Physicians and Surgeons in 1845. After practising for three or four years at Macon, Georgia, he entered Harvard, and studied natural history under L. Agassiz. An excursion made with Professors J. Hall and Agassiz to the Helderberg mountains of New York developed a keen interest in geology. After graduating at Harvard, Le Conte in 1851 accompanied Agassiz on an expedition to study the Florida reefs. On his return he became professor of natural science in Oglethorpe University, Georgia; and from 1852 to 1856 professor of natural history and geology in Franklin College. From 1857 to 1869 he was professor of chemistry and geology in South Carolina College, and he was then appointed professor of geology and natural history in the university of California, a post which he held until his death. He published a series of papers on monocular and binocular vision, and also on psychology. His chief contributions, however, related to geology, and in all he wrote he was lucid and philosophical. He described the fissure-eruptions in western America, discoursed on earth-crust movements and their causes and on the great features of the earth's surface. As separate works he published *Elements of Geology* (1878, 5th ed. 1889); *Religion and Science* (1874); and *Evolution: its History, its Evidences, and its Relation to Religious Thought* (1888). He was president of the American Association for the Advancement of Science in 1892, and of the Geological Society of America in 1896. He died in the Yosemite Valley, California, on the 6th of June 1901.



See Obituary by J. J. Stevenson, *Annals of New York Acad. of Sciences*, vol. xiv. (1902), p. 150.

**LECONTE DE LISLE, CHARLES MARIE RENÉ** (1818-1894), French poet, was born in the island of Réunion on the 22nd of October 1818. His father, an army surgeon, who brought him up with great severity, sent him to travel in the East Indies with a view to preparing him for a commercial life. After this voyage he went to Rennes to complete his education, studying especially Greek, Italian and history. He returned once or twice to Réunion, but in 1846 settled definitely in Paris. His first volume, *La Vénus de Milo*, attracted to him a number of friends many of whom were passionately devoted to classical literature. In 1873 he was made assistant librarian at the Luxembourg; in 1886 he was elected to the Academy in succession to Victor Hugo. His *Poèmes antiques* appeared in 1852; *Poèmes et poésies* in 1854; *Le Chemin de la croix* in 1859; the *Poèmes barbares*, in their first form, in 1862; *Les Erinnyes*, a tragedy after the Greek model, in 1872; for which occasional music was provided by Jules Massenet; the *Poèmes tragiques* in 1884; *L'Apollonide*, another classical tragedy, in 1888; and two posthumous volumes, *Derniers poèmes* in 1899, and *Premières poésies et lettres intimes* in 1902. In addition to his original work in verse, he published a series of admirable prose translations of Theocritus, Homer, Hesiod, Aeschylus, Sophocles, Euripides, Horace. He died at Voisins, near Louveciennes (Seine-et-Oise), on the 18th of July 1894.

In Leconte de Lisle the Parnassian movement seems to crystallize. His verse is clear, sonorous, dignified, deliberate in movement, classically correct in rhythm, full of exotic local colour, of savage names, of realistic rhetoric. It has its own kind of romance, in its "legend of the ages," so different from Hugo's, so much fuller of scholarship and the historic sense, yet with far less of human pity. Coldness cultivated as a kind of artistic distinction seems to turn all his poetry to marble, in spite of the fire at its heart. Most of Leconte de Lisle's poems are little chill epics, in which legend is fossilized. They have the lofty monotony of a single conception of life and of the universe. He sees the world as what Byron called it, "a glorious blunder," and desires only to stand a little apart from the throng, meditating scornfully. Hope, with him, becomes no more than this desperate certainty:—

"Tu te tairas, ô voix sinistre des vivants!"

His only prayer is to Death, "divine Death," that it may gather its children to its breast:—

"Affranchis-nous du temps, du nombre et de l'espace,

The interval which is his he accepts with something of the defiance of his own Cain, refusing to fill it with the triviality of happiness, waiting even upon beauty with a certain inflexible austerity. He listens and watches, throughout the world, for echoes and glimpses of great tragic passions, languid with fire in the East, a tumultuous conflagration in the middle ages, a sombre darkness in the heroic ages of the North. The burning emptiness of the desert attracts him, the inexplicable melancholy of the dogs that bark at the moon; he would interpret the jaguar’s dreams, the sleep of the condor. He sees nature with the same wrathful impatience as man, praising it for its destructive energies, its haste to crush out human life before the stars fall into chaos, and the world with them, as one of the least of stars. He sings the “Dies Irae” exultingly; only seeming to desire an end of God as well as of man, universal nothingness. He conceives that he does well to be angry, and this anger is indeed the personal note of his pessimism; but it leaves him somewhat apart from the philosophical poets, too fierce for wisdom and not rapturous enough for poetry.

(A. Sy.)

See J. Dornis, *Leconte de Lisle intime* (1895); F. Calmette, *Un Demi siècle littéraire, Leconte de Lisle et ses amis* (1902); Paul Bourget, *Nouveaux essais de psychologie contemporaine* (1885); F. Brunetière, *L’Évolution de la poésie lyrique en France au XIX^e siècle* (1894); Maurice Spronck, *Les Artistes littéraires* (1889); J. Lemaître, *Les Contemporains* (2nd series, 1886); F. Brunetière, *Nouveaux essais sur la litt. contemp.* (1895).

LE COQ, ROBERT (d. 1373), French bishop, was born at Montdidier, although he belonged to a bourgeois family of Orléans, where he first attended school before coming to Paris. In Paris he became advocate to the parlement (1347); then King John appointed him master of requests, and in 1351, a year during which he received many other honours, he became bishop of Laon. At the opening of 1354 he was sent with the cardinal of Boulogne, Pierre I., duke of Bourbon, and Jean VI., count of Vendome, to Mantes to treat with Charles the Bad, king of Navarre, who had caused the constable, Charles of Spain, to be assassinated, and from this time dates his connexion with this king. At the meeting of the estates which opened in Paris in October 1356 Le Coq played a leading rôle and was one of the most outspoken of the orators, especially when petitions were presented to the dauphin Charles, denouncing the bad government of the realm and demanding the banishment of the royal councillors. Soon, however, the credit of the estates having gone down, he withdrew to his diocese, but at the request of the bourgeois of Paris he speedily returned. The king of Navarre had succeeded in escaping from prison and had entered Paris, where his party was in the ascendant; and Robert le Coq became the most powerful person in his council. No one dared to contradict him, and he brought into it whom he pleased. He did not scruple to reveal to the king of Navarre secret deliberations, but his fortune soon turned. He ran great danger at the estates of Compiègne in May 1358, where his dismissal was demanded, and he had to flee to St Denis, where Charles the Bad and Étienne Marcel came to find him. After the death of Marcel, he tried, unsuccessfully, to deliver Laon, his episcopal town, to the king of Navarre, and he was excluded from the amnesty promised in the treaty of Calais (1360) by King John to the partisans of Charles the Bad. His temporalities had been seized, and he was obliged to flee from France. In 1363, thanks to the support of the king of Navarre, he was given the bishopric of Calahorra in the kingdom of Aragon, which he administered until his death in 1373.

See L. C. Douët d’Arcq, “Acte d’accusation contre Robert le Coq, évêque de Laon” in *Bibliothèque de l’Ecole des Chartes*, 1st series, t. ii., pp. 350-387; and R. Delachenal, “La Bibliothèque d’un avocat du XIV^e siècle, inventaire estimatif des livres de Robert le Coq,” in *Nouvelle revue historique de droit français et étranger* (1887), pp. 524-537.

LECOUVREUR, ADRIENNE (1692-1730), French actress, was born on the 5th of April 1692, at Damery, Marne, the daughter of a hatter, Robert Couvreur. She had an unhappy childhood in Paris. She showed a natural talent for declamation and was instructed by La Grand, *sociétaire* of the Comédie Française, and with his help she obtained a provincial engagement. It was not until 1717, after a long apprenticeship, that she made her Paris début as Electre, in Crébillon's tragedy of that name, and Angélique in Molière's *George Dandin*. Her success was so great that she was immediately received into the Comédie Française, and for thirteen years she was the queen of tragedy there, attaining a popularity never before accorded an actress. She is said to have played no fewer than 1184 times in a hundred rôles, of which she created twenty-two. She owed her success largely to her courage in abandoning the stilted style of elocution of her predecessors for a naturalness of delivery and a touching simplicity of pathos that delighted and moved her public. In Baron, who returned to the stage at the age of sixty-seven, she had an able and powerful coadjutor in changing the stage traditions of generations. The jealousy she aroused was partly due to her social successes, which were many, in spite of the notorious freedom of her manner of life. She was on visiting and dining terms with half the court, and her *salon* was frequented by Voltaire and all the other notables and men of letters. She was the mistress of Maurice de Saxe from 1721, and sold her plate and jewels to supply him with funds for his ill-starred adventures as duke of Courland. By him she had a daughter, her third, who was grandmother of the father of George Sand. Adrienne Lecouvreur died on the 20th of March 1730. She was denied the last rites of the Church, and her remains were refused burial in consecrated ground. Voltaire, in a fine poem on her death, expressed his indignation at the barbarous treatment accorded to the woman whose "friend, admirer, lover" he was.



Her life formed the subject of the well-known tragedy (1849), by Eugène Scribe and Ernest Legouvé.

LE CREUSOT, a town of east-central France in the department of Saône-et-Loire, 55 m. S.W. of Dijon on the Paris-Lyon railway. Pop. (1906), town, 22,535; commune, 33,437. Situated at the foot of lofty hills in a district rich in coal and iron, it has the most extensive iron works in France. The coal bed of Le Creusot was discovered in the 13th century; but it was not till 1774 that the first workshops were founded there. The royal crystal works were transferred from Sèvres to Le Creusot in 1787, but this industry came to an end in 1831. Meanwhile two or three enterprises for the manufacture of metal had ended in failure, and it was only in 1836 that the foundation of iron works by Adolphe and Eugène Schneider definitely inaugurated the industrial prosperity of the place. The works supplied large quantities of war material to the French armies during the Crimean and Franco-German wars. Since that time they have continuously enlarged the scope of their operations, which now embrace the manufacture of steel, armour-plate, guns, ordnance-stores, locomotives, electrical machinery and engineering material of every description. A network of railways about 37 m. in length connects the various branches of the works with each other and with the neighbouring Canal du Centre. Special attention is paid to the welfare of the workers who, not including the miners, number about 12,000, and good schools have been established. In 1897 the ordnance-manufacture of the Société des Forges et Chantiers de la Méditerranée at Havre was acquired by the Company, which also has important branches at Chalon-sur-Saône, where ship-building and bridge-construction is carried on, and at Cette (Hérault).

LECTERN (through O. Fr. *leitrun*, from Late Lat. *lectrum*, or *lectrinum*, *legere*, to read; the French equivalent is *lutrin*; Ital. *leggio*; Ger. *Lesepult*), in the furniture of certain Christian churches, a reading-desk, used more especially for the reading of the lessons and in the Anglican Church practically confined to that purpose. In the early Christian Church this was done from the ambo (*q.v.*), but in the 15th century, when the books were often of great size, it became necessary to provide a lectern to hold them. These were either in wood or metal, and many fine examples still exist; one at Detling in wood, in which there are shelves on all four sides to hold books, is perhaps the most elaborate. Brass lecterns, as in the colleges of Oxford and Cambridge, are common; in the usual type the book is supported on the outspread wings of an eagle or pelican, which is raised on a moulded stem, carried on three projecting ledges or feet with lions on them. In the example in Norwich cathedral, the pelican supporting the book stands on a rock enclosed with a rich cresting of Gothic tabernacle work; the central stem or pillar, on which this rests, is supported by miniature projecting buttresses, standing on a moulded base with lions on it.

LECTION, LECTIONARY. The custom of reading the books of Moses in the synagogues on the Sabbath day was a very ancient one in the Jewish Church. The addition of lections (*i.e.* readings) from the prophetic books had been made afterwards and was in existence in our Lord's time, as may be gathered from such passages as St Luke iv. 16-20, xvi. 29. This element in synagogue worship was taken over with others into the Christian divine service, additions being made to it from the writings of the apostles and evangelists. We find traces of such additions within the New Testament itself in such directions as are contained in Col. iv. 16; 1 Thess. v. 27.

From the 2nd century onwards references multiply, though the earlier references do not prove the existence of a fixed lectionary or order of lessons, but rather point the other way. Justin Martyr, describing divine worship in the middle of the 2nd century says: "On the day called Sunday all who live in cities or in the country gather together to one place, and the memoirs of the Apostles, or the writings of the Prophets are read as long as time permits" (*Apol.* i. cap. 67). Tertullian about half a century later makes frequent reference to the reading of Holy Scripture in public worship (*Apol.* 39; *De praescript.* 36; *De amina*, 9).

In the canons of Hippolytus in the first half of the 3rd century we find this direction: "Let presbyters, subdeacons and readers, and all the people assemble daily in the church at time of cock-crow, and betake themselves to prayers, to psalms and to the reading of the Scriptures, according to the command of the Apostles, until I come attend to reading" (canon xxi.).

But there are traces of fixed lessons coming into existence in the course of this century; Origen refers to the book of Job being read in Holy Week (*Commentaries on Job*, lib. i.). Allusions of a similar kind in the 4th century are frequent. John Cassian (*c.* 380) tells us that throughout Egypt the Psalms were divided into groups of twelve, and that after each group there followed two lessons, one from the Old, one from the New Testament (*De caenob. inst.* ii. 4), implying but not absolutely stating that there was a fixed order of such lessons just as there was of the Psalms. St Basil the Great mentions fixed lessons on certain occasions taken from Isaiah, Proverbs, St Matthew and Acts (Hom. xiii. *De bapt.*). From Chrysostom (Hom. lxiii *in Act.* &c.), and Augustine (Tract. vi. *in Joann.* &c.) we learn that Genesis was read in Lent, Job and Jonah in Passion Week, the Acts of the Apostles in Eastertide, lessons on the Passion on Good Friday and on the Resurrection on Easter Day. In the *Apostolical Constitutions* (ii. 57) the following service is described and enjoined. First come two lessons from the Old Testament by a reader, the whole of the Old Testament being made use of except the books of the Apocrypha. The Psalms of David are then to be sung. Next the Acts of the Apostles and the Epistles of Paul are to be read, and finally the four Gospels by a deacon or a priest. Whether the selections were *ad libitum* or according to a fixed table of lessons we are not informed. Nothing in the shape of a lectionary is extant older than the 8th century, though there is evidence that Claudianus Mamercus made one for the church at Vienne in 450, and that Musaeus made one for the church at Marseilles *c.* 458. The *Liber comitis* formerly attributed to St Jerome must be three, or nearly three, centuries later than that saint, and the Luxeuil lectionary, or *Lectionarium Gallicanum*, which Mabillon

attributed to the 7th, cannot be earlier than the 8th century; yet the oldest MSS. of the Gospels have marginal marks, and sometimes actual interpolations, which can only be accounted for as indicating the beginnings and endings of liturgical lessons. The third council of Carthage in 397 forbade anything but Holy Scripture to be read in church; this rule has been adhered to so far as the liturgical epistle and gospel, and occasional additional lessons in the Roman missal are concerned, but in the divine office, on feasts when nine lessons are read at matins, only the first three lessons are taken from Holy Scripture, the next three being taken from the sermons of ecclesiastical writers, and the last three from expositions of the day's gospel; but sometimes the lives or *Passions* of the saints, or of some particular saints, were substituted for any or all of these breviary lessons.

(F. E. W.)

LECTISTERNIUM (from Lat. *lectum sternere*, "to spread a couch"; στρωμναί in Dion. Halic. xii. 9), in ancient Rome, a propitiatory ceremony, consisting of a meal offered to gods and goddesses, represented by their busts or statues, or by portable figures of wood, with heads of bronze, wax or marble, and covered with drapery. Another suggestion is that the symbols of the gods consisted of bundles of sacred herbs, tied together in the form of a head, covered by a waxen mask so as to resemble a kind of bust (cf. the straw puppets called Argei). These symbols were laid upon a couch (*lectus*), the left arm resting on a cushion (*pulvinus*, whence the couch itself was often called *pulvinar*) in the attitude of reclining. In front of the couch, which was placed in the open street, a meal was set out on a table. It is definitely stated by Livy (v. 13) that the ceremony took place "for the first time" in Rome in the year 399 B.C., after the Sibylline books had been consulted by their keepers and 358
interpreters (*duumviri sacris faciendis*), on the occasion of a pestilence. Three couches were prepared for three pairs of gods—Apollo and Latona, Hercules and Diana, Mercury and Neptune. The feast, which on that occasion lasted for eight (or seven) days, was also celebrated by private individuals; the citizens kept open house, quarrels were forgotten, debtors and prisoners were released, and everything done to banish sorrow. Similar honours were paid to other divinities in subsequent times—Fortuna, Saturnus, Juno Regina of the Aventine, the three Capitoline deities (Jupiter, Juno, Minerva), and in 217, after the defeat of lake Trasimenus, a lectisternium was held for three days to six pairs of gods, corresponding to the twelve great gods of Olympus—Jupiter, Juno, Neptune, Minerva, Mars, Venus, Apollo, Diana, Vulcan, Vesta, Mercury, Ceres. In 205, alarmed by unfavourable prodigies, the Romans were ordered to fetch the Great Mother of the gods from Pessinus in Phrygia; in the following year the image was brought to Rome, and a lectisternium held. In later times, the lectisternium became of constant (even daily) occurrence, and was celebrated in the different temples. Such celebrations must be distinguished from those which were ordered, like the earlier lectisternia, by the Sibylline books in special emergencies. Although undoubtedly offerings of food were made to the gods in very early Roman times on such occasions as the ceremony of *confarreatio*, and the *epulum Jovis* (often confounded with the lectisternium), it is generally agreed that the lectisternia were of Greek origin. In favour of this may be mentioned: the similarity of the Greek Θεοξένια, in which, however, the gods played the part of hosts; the gods associated with it were either previously unknown to Roman religion, though often concealed under Roman names, or were provided with a new cult (thus Hercules was not worshipped as at the Ara Maxima, where, according to Servius on *Aeneid*, viii. 176 and Cornelius Balbus, *ap.* Macrobius, *Sat.* iii. 6, a lectisternium was forbidden); the Sibylline books, which decided whether a lectisternium was to be held or not, were of Greek origin; the custom of reclining at meals was Greek. Some, however, assign an Etruscan origin to the ceremony, the Sibylline books themselves being looked upon as old Italian "black books." A probable explanation of the confusion between the lectisternia and genuine old Italian ceremonies is that, as the lectisternia became an almost everyday occurrence in Rome, people forgot their foreign origin and the circumstances in which they were first introduced, and then the word *pulvinar* with its associations was transferred to times in which it had no existence. In imperial times, according to Tacitus (*Annals*, xv. 44), chairs were substituted for couches in the case of goddesses, and the lectisternium in their case became a sellisternium (the reading, however, is not certain). This was in accordance with Roman custom, since in the earliest times all the members of a family sat at meals, and in later times at least the women and children. This is a point of

distinction between the original practice at the lectisternium and the epulum Jovis, the goddesses at the latter being provided with chairs, whereas in the lectisternium they reclined. In Christian times the word was used for a feast in memory of the dead (Sidonius Apollinaris, *Epistulae*, iv. 15).

See article by A. Bouché-Leclercq in Daremberg and Saglio, *Dictionnaire des antiquités*; Marquardt, *Römische Staatsverwaltung*, iii. 45, 187 (1885); G. Wissowa, *Religion und Kultus der Römer*, p. 355 seq.; monograph by Wackermann (Hanau, 1888); C. Pascal, *Studii di antichità e mitologia* (1896).

LECTOR, or READER, a minor office-bearer in the Christian Church. From an early period men have been set apart, under the title of *anagnostae*, *lectores*, or readers, for the purpose of reading Holy Scripture in church. We do not know what the custom of the Church was in the first two centuries, the earliest reference to readers, as an order, occurring in the writings of Tertullian (*De praescript. haeret.* cap. 41); there are frequent allusions to them in the writings of St Cyprian and afterwards. Cornelius, bishop of Rome in A.D. 251-252, in a well-known letter mentions readers among the various church orders then existing at Rome. In the *Apostolic Church Order* (canon 19), mention is made of the qualifications and duties of a reader, but no reference is made to their method of ordination. In the *Apostolic Didascalia* there is recognition of three minor orders of men, subdeacons, readers and singers, in addition to two orders of women, deaconesses and widows. A century later, in the *Apostolic Constitutions*, we find not only a recognition of readers, but also a form of admission provided for them, consisting of the imposition of hands and prayer (lib. viii. cap. 22). In Africa the imposition of hands was not in use, but a Bible was handed to the newly appointed reader with words of commission to read it, followed by a prayer and a benediction (Fourth Council of Carthage, can. 8). This is the ritual of the Roman Church of to-day. With regard to age, the novels of Justinian (No. 123) forbade any one to be admitted to the office of reader under the age of eighteen.

(F. E. W.)

LECTOURE, a town of south-western France, capital of an arrondissement in the department of Gers, 21 m. N. of Auch on the Southern railway between that city and Agen. Pop. (1906), town, 2426; commune, 4310. It stands on the right bank of the Gers, overlooking the river from the summit of a steep plateau. The church of St Gervais and St Protais was once a cathedral. The massive tower which flanks it on the north belongs to the 15th century; the rest of the church dates from the 13th, 15th, 16th and 17th centuries. The hôtel de ville, the sous-préfecture and the museum occupy the palace of the former bishops, which was once the property of Marshal Jean Lannes, a native of the town. A recess in the wall of an old house contains the Fontaine de Houndélie, a spring sheltered by a double archway of the 13th century. At the bottom of the hill a church of the 16th century marks the site of the monastery of St Gény. Lectoure has a tribunal of first instance and a communal college. Its industries include distilling, the manufacture of wooden shoes and biscuits, and market gardening; it has trade in grain, cattle, wine and brandy.

Lectoure, capital of the Iberian tribe of the *Lactorates* and for a short time of Novempopulania, became the seat of a bishopric in the 4th century. In the 11th century the counts of Lomagne made it their capital, and on the union of Lomagne with Armagnac, in 1325, it became the capital of the counts of Armagnac. In 1473 Cardinal Jean de Jouffroy besieged the town on behalf of Louis XI. and after its fall put the whole population to the sword. In 1562 it again suffered severely at the hands of the Catholics under Blaise de Montluc.

**LEDA,** in Greek mythology, daughter of Thestius, king of Aetolia, and Eurythemis (her parentage is variously given). She was the wife of Tyndareus and mother of Castor and Pollux, Clytaemnestra and Helen (see CASTOR AND POLLUX). In another account Nemesis was the mother of Helen (*q.v.*) whom Leda adopted as her daughter. This led to the identification of Leda and Nemesis. In the usual later form of the story, Leda herself, having been visited by Zeus in the form of a swan, produced two eggs, from one of which came Helen, from the other Castor and Pollux.

See Apollodorus iii. 10; Hyginus, *Fab.* 77; Homer, *Iliad*, iii. 426, *Od.* xi. 298; Euripides, *Helena*, 17; Isocrates, *Helena*, 59; Ovid, *Heroides*, xvii. 55; Horace, *Ars poetica*, 147; Stasinus in Athenaeus viii. 334 c.; for the representations of Leda and the swan in art, J. A. Overbeck, *Kunstmythologie*, i., and Atlas to the same; also article in Roscher's *Lexikon der Mythologie*.

**LE DAIM** (or LE DAIN), **OLIVIER** (d. 1484), favourite of Louis XI. of France, was born of humble parentage at Thielt near Courtrai in Flanders. Seeking his fortune at Paris, he became court barber and valet to Louis XI., and so ingratiated himself with the king that in 1474 he was ennobled under the title Le Daim and in 1477 made comte de Meulant. In the latter year he was sent to Burgundy to influence the young heiress of Charles the Bold, but he was ridiculed and compelled to leave Ghent. He thereupon seized and held Tournai for the French. Le Daim had considerable talent for intrigue, and, according to his enemies, could always be depended upon to execute the baser designs of the king. He amassed a large fortune, largely by oppression and violence, and was named gentleman-in-waiting, captain of Loches, and governor of Saint-Quentin. He remained in favour until the death of Louis XI., when the rebellious lords were able to avenge the slights and insults they had suffered at the hands of the royal barber. He was arrested on charges, the nature of which is uncertain, tried before the parlement of Paris, and on the 21st of May 1484 hanged at Montfaucon without the knowledge of Charles VIII., who might have heeded his father's request and spared the favourite. Le Daim's property was given to the duke of Orleans.



See the memoirs of the time, especially those of Ph. de Commines (ed. Mandrot, 1901-1903, Eng. trans. in Bohn Library); Robt. Gaguin, *Compendium de origine et gestis Francorum* (Paris, 1586)—it was Gaguin who made the celebrated epigram concerning Le Daim: "Eras judex, lector, et exitium"; De Reiffenberg, *Olivier le Dain* (Brussels, 1829); Delanone, *Le Barbier de Louis XI.* (Paris, 1832): G. Picot, "Procès d'Olivier le Dain," in the *Comptes rendus de l'Académie des sciences morales et politiques*, viii. (1877), 485-537. The memoirs of the time are uniformly hostile to Le Daim.

**LEDBURY,** a market town in the Ross parliamentary division of Herefordshire, England, 14½ m. E. of Hereford by the Great Western railway, pleasantly situated on the south-western slope of the Malvern Hills. Pop. of urban district (1901) 3259. Cider and agricultural produce are the chief articles of trade, and there are limestone quarries in the neighbouring hills. The town contains many picturesque examples of timbered houses, characteristic of the district, the principal being the Market House (1633) elevated on massive pillars of oak. The fine church of St Michael exhibits all the Gothic styles, the most

noteworthy features being the Norman chancel and west door, and the remarkable series of ornate Decorated windows on the north side. Among several charities is the hospital of St Catherine, founded by Foliot, bishop of Hereford, in 1232. Hope End, 2 m. N.E. of Ledbury, was the residence of Elizabeth Barrett Browning during her early life. A clock-tower in the town commemorates her.

Wall Hills Camp, supposed to be of British origin, is the earliest evidence of a settlement near Ledbury (Liedeburge, Lidebury). The manor was given to the see of Hereford in the 11th century; but in 1561-1562 became crown property. As early as 1170-1171 an episcopal castle existed in Ledbury. The town was not incorporated, but was early called a borough; and in 1295 and 1304-1305 returned two members to parliament. A fair on the day of the decollation of John the Baptist was granted to the bishop in 1249. Of fairs which survived in 1792 those of the days of St Philip and St James and St Barnabas were granted in 1584-1585; those held on the Monday before Easter and St Thomas's day were reputed ancient, but not those of the 12th of May, the 22nd of June, the 2nd of October and the 21st of December. Existing fairs are on the second Tuesday in every month and in October. A weekly market, granted to the bishop by Stephen, John and Henry III., was obsolete in 1584-1585, when the present market of Tuesday was authorized. The wool trade was considerable in the 14th century; later Ledbury was inhabited by glovers and clothiers. The town was deeply involved in the operations of the Civil Wars, being occupied both by the royalist leader Prince Rupert and by the Parliamentarian Colonel Birch.

LEDGER (from the English dialect forms *liggen* or *leggen*, to lie or lay; in sense adapted from the Dutch substantive *legger*), properly a book remaining regularly in one place, and so used of the copies of the Scriptures and service books kept in a church. The *New English Dictionary* quotes from Charles Wriothesley's *Chronicle*, 1538 (ed. *Camden Soc.*, 1875, by W. D. Hamilton), "the curates should provide a booke of the bible in Englishe, of the largest volume, to be a lidger in the same church for the parishioners to read on." It is an application of this original meaning that is found in the commercial usage of the term for the principal book of account in a business house (see BOOK-KEEPING). Apart from these applications to various forms of books, the word is used of the horizontal timbers in a scaffold (*q.v.*) lying parallel to the face of a building, which support the "put logs"; of a flat stone to cover a grave; and of a stationary form of tackle and bait in angling. In the form "lieger" the term was formerly frequently applied to a "resident," as distinguished from an "extraordinary" ambassador.

LEDOCHOWSKI, MIECISLAUS JOHANN, COUNT (1822-1902), Polish cardinal, was born on the 29th of October 1822 in Gorki (Russian Poland), and received his early education at the gymnasium and seminary of Warsaw. After finishing his studies at the Jesuit Accademia dei Nobili Ecclesiastici in Rome, which strongly influenced his religious development and his attitude towards church affairs, he was ordained in 1845. From 1856 to 1858 he represented the Roman See in Columbia, but on the outbreak of the Columbian revolution had to return to Rome. In 1861 Pope Pius IX. made him his nuncio at Brussels, and in 1865 he was made archbishop of Gnesen-Posen. His preconization followed on the 8th of January 1866. This date marks the beginning of the second period in Ledochowski's life; for during the Prussian and German *Kulturkampf* he was one of the most declared enemies of the state. It was only during the earliest years of his appointment as archbishop that he entertained a different view, invoking, for instance, an intervention of Prussia in favour of the Roman Church, when it was oppressed by the house of Savoy. On the 12th of December 1870 he presented an effective memorandum on the subject at the headquarters at Versailles. In 1872 the archbishop protested against the demand of the government that religious teaching should be given only in the German language, and in 1873 he addressed a

circular letter on this subject to the clergy of his diocese. The government thereupon demanded a statement from the teachers of religion as to whether they intended to obey it or the archbishop, and on their declaring for the archbishop, dismissed them. The count himself was called upon at the end of 1873 to lay aside his office. On his refusing to do so, he was arrested between 3 and 4 o'clock in the morning on the 3rd of February 1874 by Staňdi the director of police, and taken to the military prison of Ostrowo. The pope made him a cardinal on the 13th of March, but it was not till the 3rd of February 1876 that he was released from prison. Having been expelled from the eastern provinces of Prussia, he betook himself to Cracow, where his presence was made the pretext for anti-Prussian demonstrations. Upon this he was also expelled from Austria, and went to Rome, whence, in spite of his removal from office, which was decreed on the 15th of April 1874, he continued to direct the affairs of his diocese, for which he was on several occasions from 1877 to 1879 condemned *in absentia* by the Prussian government for "usurpation of episcopal rights." It was not till 1885 that Ledochowski resolved to resign his archbishopric, in which he was succeeded by Dinder at the end of the year. Ledochowski's return in 1884 was forbidden by the Prussian government (although the *Kulturkampf* had now abated), on account of his having stirred up anew the Polish nationalist agitation. He passed the closing years of his life in Rome. In 1892 he became prefect of the Congregation of the Propaganda, and he died in Rome on the 22nd of July 1902.

See Ograbiszewski, *Deutschlands Episkopat in Lebensbildern* (1876 and following years); Holtzmann-Zöppfel, *Lexikon für Theologie und Kirchenwesen* (2nd ed., 1888); Vapereau, *Dictionnaire universel des contemporains* (6th ed., 1893); Brück, *Geschichte der katholischen Kirche in Deutschland im neunzehnten Jahrhundert* vol. 4 (1901 and 1908); Lauchert, *Biographisches Jahrbuch*, vol. 7 (1905).

(J. Hn.)

## LEDRU-ROLLIN, ALEXANDRE AUGUSTE (1807-1874), French politician,

was the grandson of Nicolas Philippe Ledru, the celebrated quack doctor known as "Comus" under Louis XIV., and was born in a house that was once Scarron's, at Fontenay-aux-Roses (Seine), on the 2nd of February 1807. He had just begun to practise at the Parisian bar before the revolution of July, and was retained for the Republican defence in most of the great political trials of the next ten years. In 1838 he bought for 330,000 francs Desiré Dalloz's place in the Court of Cassation. He was elected deputy for Le Mans in 1841 with hardly a dissentient voice; but for the violence of his electoral speeches he was tried at Angers and sentenced to four months' imprisonment and a fine, against which he appealed successfully on a technical point. He made a rich and romantic marriage in 1843, and in 1846 disposed of his charge at the Court of Cassation to give his time entirely to politics. He was now the recognized leader of the working-men of France. He had more authority in the country than in the Chamber, where the violence of his oratory diminished its effect. He asserted that the fortifications of Paris were directed against liberty, not against foreign invasion, and he stigmatized the law of regency (1842) as an audacious usurpation. Neither from official Liberalism nor from the press did he receive support; even the Republican *National* was opposed to him because of his championship of labour. He therefore founded *La Réforme* in which to advance his propaganda. Between Ledru-Rollin and Odilon Barrot with the other chiefs of the "dynastic Left" there were acute differences, hardly dissimulated even during the temporary alliance which produced the campaign of the banquets. It was the speeches of Ledru-Rollin and Louis Blanc at working-men's banquets in Lille, Dijon and Châlons that really heralded the revolution. Ledru-Rollin prevented the appointment of the duchess of Orleans as regent in 1848. He and Lamartine held the tribune in the Chamber of Deputies until the Parisian populace stopped serious discussion by invading the Chamber. He was minister of the interior in the provisional government, and was also a member of the executive committee[1] appointed by the Constituent Assembly, from which Louis Blanc and the extremists were excluded. At the crisis of the 15th of May he definitely sided with Lamartine and the party of order against the proletariat. Henceforward his position was a difficult one. He never regained his influence with the working classes, who considered they had been betrayed; but to his short ministry belongs the credit of the establishment of a working system of universal suffrage. At the presidential election in December he was put forward as the Socialist candidate, but secured only 370,000 votes. His opposition to the

policy of President Louis Napoleon, especially his Roman policy, led to his moving the impeachment of the president and his ministers. The motion was defeated, and next day (June 13, 1849) he headed what he called a peaceful demonstration, and his enemies armed insurrection. He himself escaped to London where he joined the executive of the revolutionary committee of Europe, with Kossuth and Mazzini among his colleagues. He was accused of complicity in an obscure attempt (1857) against the life of Napoleon III., and condemned in his absence to deportation. Émile Ollivier removed the exceptions from the general amnesty in 1870, and Ledru-Rollin returned to France after twenty years of exile. Though elected in 1871 in three departments he refused to sit in the National Assembly, and took no serious part in politics until 1874 when he was returned to the Assembly as member for Vaucluse. He died on the 31st of December of that year.

Under Louis Philippe he made large contributions to French jurisprudence, editing the *Journal du palais, 1791-1837* (27 vols., 1837), and *1837-1847* (17 vols.), with a commentary *Répertoire général de la jurisprudence française* (8 vols., 1843-1848), the introduction to which was written by himself. His later writings were political in character. See *Ledru-Rollin, ses discours et ses écrits politiques* (2 vols., Paris, 1879), edited by his widow.

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1 Arago, Garnier-Pagès, Marie, Lamartine, and Ledru-Rollin.

## LEDYARD, JOHN

(1751-1789), American traveller, was born in Groton, Connecticut, U.S.A. After vainly trying law and theology, Ledyard adopted a seaman's life, and, coming to London, was engaged as corporal of marines by Captain Cook for his third voyage (1776). On his return (1778) Ledyard had to give up to the Admiralty his copious journals, but afterwards published, from memory, a meagre narrative of his experiences—herein giving the only account of Cook's death by an eye-witness (Hartford, U.S.A., 1783). He continued in the British service till 1782, when he escaped, off Long Island. In 1784 he revisited Europe, to organize an expedition to the American North-West. Having failed in his attempts, he decided to reach his goal by travelling across Europe and Asia. Baffled in his hopes of crossing the Baltic on the ice (Stockholm to Abo), he walked right round from Stockholm to St Petersburg, where he arrived barefoot and penniless (March 1787). Here he made friends with Pallas and others, and accompanied Dr Brown, a Scotch physician in the Russian service, to Siberia. Ledyard left Dr Brown at Barnaul, went on to Tomsk and Irkutsk, visited Lake Baikal, and descended the Lena to Yakutsk (18th of September 1787). With Captain Joseph Billings, whom he had known on Cook's "Resolution," he returned to Irkutsk, where he was arrested, deported to the Polish frontier, and banished from Russia for ever. Reaching London, he was engaged by Sir Joseph Banks and the African Association to explore overland routes from Alexandria to the Niger, but in Cairo he succumbed to a dose of vitriol (17th of January 1789). Though a born explorer, little resulted from his immense but ill-directed activities.

See *Memoirs of the Life and Travels of John Ledyard*, by Jared Sparks (1828).

## LEE, ANN

(1736-1784), English religious visionary, was born in Manchester, where she was first a factory hand and afterwards a cook. She is remembered by her connexion with the sect known as Shakers (*q.v.*). She died at Watervliet, near Albany, New York.

**LEE, ARTHUR** (1740-1792), American diplomatist, brother of Richard Henry Lee, was born at Stratford, Westmoreland county, Virginia, on the 20th of December 1740. He was educated at Eton, studied medicine at Edinburgh, practised as a physician in Williamsburg, Virginia, read law at the Temple, London, in 1766-1770, and practised law in London in 1770-1776. He was an intimate of John Wilkes, whom he aided in one of his London campaigns. In 1770-1775 he served as London agent for Massachusetts, second to Benjamin Franklin, whom he succeeded in 1775. At that time he had shown great ability as a pamphleteer, having published in London *The Monitor* (1768), seven essays previously printed in Virginia; *The Political Detection: or the Treachery and Tyranny of Administration, both at Home and Abroad* (1770), signed "Junius Americanus"; and *An Appeal to the Justice and Interests of the People of Great Britain in the Present Disputes with America* (1774), signed "An Old Member of Parliament." In December 1775 the Committee of Secret Correspondence of Congress chose him its European agent principally for the purpose of ascertaining the views of France, Spain, and other European countries regarding the war between the colonies and Great Britain. In October 1776 he was appointed, upon the refusal of Jefferson, on the commission with Franklin and Silas Deane to negotiate a treaty of alliance, amity and commerce with France, and also to negotiate with other European governments. His letters to Congress, in which he expressed his suspicion of Deane's business integrity and criticized his accounts, resulted in Deane's recall; and other letters impaired the confidence of Congress in Franklin, of whom he was especially jealous. Early in 1777 he went to Spain as American commissioner, but received no official recognition, was not permitted to proceed farther than Burgos, and accomplished nothing; until the appointment of Jay, however, he continued to act as commissioner to Spain, held various conferences with the Spanish minister in Paris, and in January 1778 secured a promise of a loan of 3,000,000 livres, only a small part of which (some 170,000 livres) was paid. In June 1777 he went to Berlin, where, as in Spain, he was not officially recognized. Although he had little to do with the negotiations, he signed with Franklin and Deane in February 1778 the treaties between the United States and France. Having become unpopular at the courts of France and Spain, Lee was recalled in 1779, and returned to the United States in September 1780. He was a member of the Virginia House of Delegates in 1781 and a delegate to the Continental Congress in 1782-1785. With Oliver Wolcott and Richard Butler he negotiated a treaty with the Six Nations, signed at Fort Stanwix on the 22nd of October 1784, and with George Clark and Richard Butler a treaty with the Wyandot, Delaware, Chippewa and Ottawa Indians, signed at Ft. McIntosh on the 21st of January 1785. He was a member of the treasury board in 1784-1789. He strongly opposed the constitution, and after its adoption retired to his estate at Urbana, Virginia, where he died on the 12th of December 1792.

See R. H. Lee, *Life of Arthur Lee* (2 vols., Boston, 1829), and C. H. Lee, *A Vindication of Arthur Lee* (Richmond, Virginia, 1894), both partisan. Much of Lee's correspondence is to be found in Wharton's *Revolutionary Diplomatic Correspondence* (Washington, 1889). Eight volumes of Lee's MSS. in the Harvard University Library are described and listed in *Library of Harvard University, Bibliographical Contributions*, No. 8 (Cambridge, 1882).

**LEE, FITZHUGH** (1835-1905), American cavalry general, was born at Clermont, in Fairfax county, Virginia, on the 19th of November 1835. He was the grandson of "Light Horse Harry" Lee, and the nephew of Robert E. Lee. His father, Sydney Smith Lee, was a fleet captain under Commodore Perry in Japanese waters and rose to the rank of commodore; his mother was a daughter of George Mason. Graduating from West Point in 1856, he was appointed to the 2nd Cavalry, which was commanded by Colonel Albert Sidney Johnston, and in which his uncle, Robert E. Lee, was lieutenant-colonel. As a cavalry subaltern he distinguished himself by his gallant conduct in actions with the Comanches in Texas, and was severely wounded in 1859. In May 1860 he was appointed instructor of cavalry at West Point, but resigned on the secession of Virginia. Lee was at once employed in the organization of the forces of the South, and served at first as a staff officer to General R. S. Ewell, and afterwards, from September 1861, as lieutenant-colonel, and from April 1862 as colonel of the First Virginia Cavalry in the Army of Northern Virginia. He became

brigadier-general on General J. E. B. Stuart's recommendation on the 25th of July 1862, and served under that general throughout the Virginian campaigns of 1862 and 1863, becoming major-general on the 3rd of September 1863. He conducted the cavalry action of Beverly Ford (17th March 1863) with skill and success. In the Wilderness and Petersburg campaigns he was constantly employed as a divisional commander under Stuart, and, after Stuart's death, under General Wade Hampton. He took part in Early's campaign against Sheridan in the Shenandoah Valley, and at Winchester (19th Sept. 1864) three horses were shot under him and he was severely wounded. On General Hampton's being sent to assist General Joseph E. Johnston in North Carolina, the command of the whole of General Lee's cavalry devolved upon Fitzhugh Lee early in 1865, but the surrender of Appomattox followed quickly upon the opening of the campaign. Fitzhugh Lee himself led the last charge of the Confederates on the 9th of April that year at Farmville.

After the war he devoted himself to farming in Stafford county, Virginia, and was conspicuous in his efforts to reconcile the Southern people to the issue of the war, which he regarded as a final settlement of the questions at issue. In 1875 he attended the Bunker Hill centenary at Boston, Mass., and delivered a remarkable address. In 1885 he was a member of the board of visitors of West Point, and from 1886 to 1890 was governor of Virginia. In April 1896 he was appointed by President Cleveland consul-general at Havana, with duties of a diplomatic and military character added to the usual consular business. In this post (in which he was retained by President McKinley) he was from the first called upon to deal with a situation of great difficulty, which culminated with the destruction of the "Maine" (see Spanish-American War). Upon the declaration of war between Spain and the United States he re-entered the army. He was one of the three ex-Confederate general officers who were made major-generals of United States Volunteers. Fitzhugh Lee commanded the VII. army corps, but took no part in the actual operations in Cuba. He was military governor of Havana and Pinar del Rio in 1899, subsequently commanded the department of the Missouri, and retired as a brigadier-general U.S. Army in 1901. He died in Washington on the 28th of April 1905. He wrote *Robert E. Lee* (1894) in the "Great Commanders" series, and *Cuba's Struggle Against Spain* (1899).

LEE, GEORGE ALEXANDER (1802-1851), English musician, was born in London, the son of Henry Lee, a pugilist and innkeeper. He became "tiger" to Lord Barrymore, and his singing led to his being educated for the musical profession. After appearing as a tenor at the theatres in Dublin and London, he joined in producing opera at the Tottenham Street theatre in 1829, and afterwards was connected with musical productions at Drury Lane and Covent Garden. He married Mrs Waylett, a popular singer. Lee composed music for a number of plays, and also many songs, including the popular "Come where the Aspens quiver," and for a short time had a music-selling business in the Quadrant. He died on the 8th of October 1851.

LEE, HENRY (1756-1818), American general, called "Light Horse Harry," was born near Dumfries, Virginia, on the 29th of January 1756. His father was first cousin to Richard Henry Lee. With a view to a legal career he graduated (1773) at Princeton, but soon afterwards, on the outbreak of the War of Independence, he became an officer in the patriot forces. He served with great distinction under Washington, and in 1778 was promoted major and given the command of a small irregular corps, with which he won a great reputation as a leader of light troops. His services on the outpost line of the army earned for him the soubriquet of "Light Horse Harry." His greatest exploit was the brilliant surprise of Paulus Hook, N.J., on the 19th of August 1779; for this feat he received a gold medal, a reward given to no other officer below general's rank in the whole war. He was promoted

lieutenant-colonel 1780, and sent with a picked corps of dragoons to the southern theatre of war. Here he rendered invaluable services in victory and defeat, notably at Guilford Court House, Camden and Eutaw Springs. He was present at Cornwallis's surrender at Yorktown, and afterwards left the army owing to ill-health. From 1786 to 1788 he was a delegate to the Confederation Congress, and in the last-named year in the Virginia convention he favoured the adoption of the Federal constitution. From 1789 to 1791 he served in the General Assembly, and from 1791 to 1794 was governor of Virginia. In 1794 Washington sent him to help in the suppression of the "Whisky Insurrection" in western Pennsylvania. A new county of Virginia was named after him during his governorship. He was a major-general in 1798-1800. From 1799 to 1801 he served in Congress. He delivered the address on the death of Washington which contained the famous phrase, "first in war, first in peace, and first in the hearts of his countrymen." Soon after the War of 1812 broke out, Lee, while helping to resist the attack of a mob on his friend, A. C. Hanson, editor of the Baltimore *Federal Republican*, which had opposed the war, received grave injuries, from which he never recovered. He died at the house of General Nathanael Greene on Cumberland Island, Georgia, on the 25th of March 1818.

Lee wrote valuable *Memoirs of the War in the Southern Department* (1812; 3rd ed., with memoir by Robert E. Lee, 1869).

LEE, JAMES PRINCE (1804-1869), English divine, was born in London on the 28th of July 1804, and was educated at St Paul's school and at Trinity College, Cambridge, where he displayed exceptional ability as a classical scholar. After taking orders in 1830 he served under Thomas Arnold at Rugby school, and in 1838 was appointed head-master of King Edward's school, Birmingham, where he had among his pupils E. W. Benson, J. B. Lightfoot and B. F. Westcott. In 1848 Lord John Russell nominated him as first bishop of the newly-constituted see of Manchester. His pedagogic manner bore somewhat irksomely on his clergy. He is best remembered for his splendid work in church extension; during his twenty-one years' tenure of the see he consecrated 130 churches. He took a foremost part in founding the Manchester free library, and bequeathed his own valuable collection of books to Owens College. He died on the 24th of December 1869.

A memorial sermon was preached by Archbishop E. W. Benson, and was published with biographical details by J. F. Wickenden and others.

LEE, NATHANIEL (*c.* 1653-1692), English dramatist, son of Dr Richard Lee, a Presbyterian divine, was born probably in 1653. His father was rector of Hatfield, and held many preferments under the Commonwealth. He was chaplain to General Monk, afterwards duke of Albemarle, and after the Restoration he conformed to the Church of England, abjuring his former opinions, especially his approval of Charles I.'s execution. Nathaniel Lee was educated at Westminster school, and at Trinity College, Cambridge, taking his B.A. degree in 1668. Coming to London under the patronage, it is said, of the duke of Buckingham, he tried to earn his living as an actor, but though he was an admirable reader, his acute stage fright made acting impossible. His earliest play, *Nero, Emperor of Rome*, was acted in 1675 at Drury Lane. Two tragedies written in rhymed heroic couplets, in imitation of Dryden, followed in 1676—*Sophonisba, or Hannibal's Overthrow and Gloriana, or the Court of Augustus Caesar*. Both are extravagant in design and treatment. Lee made his reputation in 1677 with a blank verse tragedy, *The Rival Queens, or the Death of Alexander the Great*. The play, which treats of the jealousy of Alexander's first wife, Roxana, for his second wife, Statira, was, in spite of much bombast, a favourite on the English stage down to the days of Edmund Kean. *Mithridates, King of Pontus* (acted 1678), *Theodosius, or the Force of Love* (acted 1680), *Caesar Borgia* (acted 1680)—an imitation of the worst blood

and thunder Elizabethan tragedies—*Lucius Junius Brutus, Father of His Country* (acted 1681), and *Constantine the Great* (acted 1684) followed. *The Princess of Cleve* (1681) is a gross adaptation of Madame de La Fayette's exquisite novel of that name. *The Massacre of Paris* (published 1690) was written about this time. Lee had given offence at court by his *Lucius Junius Brutus*, which had been suppressed after its third representation for some lines on Tarquin's character that were taken to be a reflection on Charles II. He therefore joined with Dryden, who had already admitted him as a collaborator in an adaptation of *Oedipus*, in *The Duke of Guise* (1683), a play which directly advocated the Tory point of view. In it part of the *Massacre of Paris* was incorporated. Lee was now thirty years of age, and had already achieved a considerable reputation. But he had lived in the dissipated society of the earl of Rochester and his associates, and imitated their excesses. As he grew more disreputable, his patrons neglected him, and in 1684 his mind was completely unhinged. He spent five years in Bethlehem Hospital, and recovered his health. He died in a drunken fit in 1692, and was buried in St Clement Danes, Strand, on the 6th of May.

Lee's *Dramatic Works* were published in 1784. In spite of their extravagance, they contain many passages of great beauty.

LEE, RICHARD HENRY (1732-1794), American statesman and orator, was born at Stratford, in Westmoreland county, Virginia, on the 20th of January 1732, and was one of six distinguished sons of Thomas Lee (d. 1750), a descendant of an old Cavalier family, the first representative of which in America was Richard Lee, who was a member of the privy council, and early in the reign of Charles I. emigrated to Virginia. Richard Henry Lee received an academic education in England, then spent a little time in travel, returned to Virginia in 1752, having come into possession of a fine property left him by his father, and for several years applied himself to varied studies. When twenty-five he was appointed justice of the peace of Westmoreland county, and in the same year was chosen a member of the Virginia House of Burgesses, in which he served from 1758 to 1775. He kept a diffident silence during two sessions, his first speech being in strong opposition to slavery, which he proposed to discourage and eventually to abolish, by imposing a heavy tax on all further importations. He early allied himself with the Patriot or Whig element in Virginia, and in the years immediately preceding the War of Independence was conspicuous as an opponent of the arbitrary measures of the British ministry. In 1768, in a letter to John Dickinson of Pennsylvania, he suggested a private correspondence among the friends of liberty in the different colonies, and in 1773 he became a member of the Virginia Committee of Correspondence.

Lee was one of the delegates from Virginia to the first Continental Congress at Philadelphia in 1774, and prepared the address to the people of British America, and the second address to the people of Great Britain, which are among the most effective papers of the time. In accordance with instructions given by the Virginia House of Burgesses, Lee introduced in Congress, on the 7th of June 1776, the following famous resolutions: (1) "that these united colonies are, and of right ought to be, free and independent states, that they are absolved from all allegiance to the British crown, and that all political connexion between them and the state of Great Britain is, and ought to be, totally dissolved"; (2) "that it is expedient to take the most effectual measures for forming foreign alliances"; and (3) "that a plan of confederation be prepared and transmitted to the respective colonies for their consideration and approbation." After debating the first of these resolutions for three days, Congress resolved that the further consideration of it should be postponed until the 1st of July, but that a committee should be appointed to prepare a declaration of independence. The illness of Lee's wife prevented him from being a member of that committee, but his first resolution was adopted on the 2nd of July, and the Declaration of Independence, prepared principally by Thomas Jefferson, was adopted two days later. Lee was in Congress from 1774 to 1780, and was especially prominent in connexion with foreign affairs. He was a member of the Virginia House of Delegates in 1777, 1780-1784 and 1786-1787; was in Congress again from 1784 to 1787, being president in 1784-1786; and was one of the first United States senators chosen from Virginia after the adoption of the Federal constitution. Though strongly opposed to the adoption of that constitution, owing to what he

regarded as its dangerous infringements upon the independent power of the states, he accepted the place of senator in hope of bringing about amendments, and proposed the Tenth Amendment in substantially the form in which it was adopted. He became a warm supporter of Washington's administration, and his prejudices against the constitution were largely removed by its working in practice. He retired from public life in 1792, and died at Chantilly, in Westmoreland county, on the 19th of June 1794.

See the *Life* (Philadelphia, 1825), by his grandson, R. H. Lee; and *Letters* (New York, 1910), edited by J. C. Ballagh.

His brother, William Lee (1739-1795), was a diplomatist during the War of Independence. He accompanied his brother, Arthur Lee (*q.v.*), to England in 1766 to engage in mercantile pursuits, joined the Wilkes faction, and in 1775 was elected an alderman of London, then a life-position. In April 1777, however, he received notice of his appointment by the Committee of Secret Correspondence in America to act with Thomas Morris as commercial agent at Nantes. He went to Paris and became involved in his brother's opposition to Franklin and Deane. In May 1777 Congress chose William Lee commissioner to the courts of Vienna and Berlin, but he gained recognition at neither. In September 1778, however, while at Aix-la-Chapelle, he negotiated a plan of a treaty with Jan de Neufville, who represented Van Berckel, pensionary of Amsterdam. It was a copy of this proposed treaty which, on falling into the hands of the British on the capture of Henry Laurens, the duly appointed minister to the Netherlands, led to Great Britain's declaration of war against the Netherlands in December 1780. Lee was recalled from his mission to Vienna and Berlin in June 1779, without being required to return to America. He resigned his post as an alderman of London in January 1780, and returned to Virginia about 1784.

See *Letters of William Lee*, edited by W. C. Ford (Brooklyn, 1891).

Another brother, Francis Lightfoot Lee (1734-1797), was a member of the Virginia House of Burgesses in 1770-1775. In 1775-1779 he was a delegate to the Continental Congress, and as such signed the Declaration of Independence. He served on the committee which drafted the Articles of Confederation, and contended that there should be no treaty of peace with Great Britain which did not grant to the United States both the right to the Newfoundland fisheries and the free navigation of the Mississippi. After retiring from Congress he served in 1780-1782 in the Virginia Senate.

## LEE, ROBERT EDWARD

(1807-1870), American soldier, general in the Confederate States army, was the youngest son of major-general Henry Lee, called "Light Horse Harry." He was born at Stratford, Westmoreland county, Virginia, on the 19th of January 1807, and entered West Point in 1825. Graduating four years later second in his class, he was given a commission in the U.S. Engineer Corps. In 1831 he married Mary, daughter of G. W. P. Custis, the adopted son of Washington and the grandson of Mrs Washington. In 1836 he became first lieutenant, and in 1838 captain. In this rank he took part in the Mexican War, repeatedly winning distinction for conduct and bravery. He received the brevets of major for Cerro Gordo, lieut.-colonel for Contreras-Churubusco and colonel for Chapultepec. After the war he was employed in engineer work at Washington and Baltimore, during which time, as before the war, he resided on the great Arlington estate, near Washington, which had come to him through his wife. In 1852 he was appointed superintendent of West Point, and during his three years here he carried out many important changes in the academy. Under him as cadets were his son G. W. Custis Lee, his nephew, Fitzhugh Lee and J. E. B. Stuart, all of whom became general officers in the Civil War. In 1855 he was appointed as lieut.-colonel to the 2nd Cavalry, commanded by Colonel Sidney Johnston, with whom he served against the Indians of the Texas border. In 1859, while at Arlington on leave, he was summoned to command the United States troops sent to deal with the John Brown raid on Harper's Ferry. In March 1861 he was made colonel of the 1st U.S. Cavalry; but his career in the old army ended with the secession of Virginia in the following month. Lee was strongly averse to secession, but felt obliged to conform to the action of his own state. The Federal authorities offered Lee the command of the field army about to invade the South, which he refused. Resigning his commission, he made his way to

Richmond and was at once made a major-general in the Virginian forces. A few weeks later he became a brigadier-general (then the highest rank) in the Confederate service.

The military operations with which the great Civil War opened in 1861 were directed by President Davis and General Lee. Lee was personally in charge of the unsuccessful West Virginian operations in the autumn, and, having been made a full general on the 31st of August, during the winter he devoted his experience as an engineer to the fortification and general defence of the Atlantic coast. Thence, when the well-drilled Army of the Potomac was about to descend upon Richmond, he was hurriedly recalled to Richmond. General Johnston was wounded at the battle of Fair Oaks (Seven Pines) on the 31st of May 1862, and General Robert E. Lee was assigned to the command of the famous Army of Northern Virginia which for the next three years "carried the rebellion on its bayonets." Little can be said of Lee's career as a commander-in-chief that is not an integral part of the history of the Civil War. His first success was the "Seven Days' Battle" (*q.v.*) in which he stopped McClellan's advance; this was quickly followed up by the crushing defeat of the Federal army under Pope, the invasion of Maryland and the sanguinary and indecisive battle of the Antietam (*q.v.*). The year ended with another great victory at Fredericksburg (*q.v.*). Chancellorsville (see Wilderness), won against odds of two to one, and the great three days' battle of Gettysburg (*q.v.*), where for the first time fortune turned decisively against the Confederates, were the chief events of 1863. In the autumn Lee fought a war of manœuvre against General Meade. The tremendous struggle of 1864 between Lee and Grant included the battles of the Wilderness (*q.v.*), Spottsylvania, North Anna, Cold Harbor and the long siege of Petersburg (*q.v.*), in which, almost invariably, Lee was locally successful. But the steady pressure of his unrelenting opponent slowly wore down his strength. At last with not more than one man to oppose to Grant's three he was compelled to break out of his Petersburg lines (April 1865). A series of heavy combats revealed his purpose, and Grant pursued the dwindling remnants of Lee's army to the westward. Headed off by the Federal cavalry, and pressed closely in rear by Grant's main body, General Lee had no alternative but to surrender. At Appomattox Court House, on the 9th of April, the career of the Army of Northern Virginia came to an end. Lee's farewell order was issued on the following day, and within a few weeks the Confederacy was at an end. For a few months Lee lived quietly in Powhatan county, making his formal submission to the Federal authorities and urging on his own people acceptance of the new conditions. In August he was offered, and accepted, the presidency of Washington College, Lexington (now Washington and Lee University), a post which he occupied until his death on the 12th of October 1870. He was buried in the college grounds.

For the events of Lee's military career briefly indicated in this notice the reader is referred to the articles American Civil War, &c. By his achievements he won a high place amongst the great generals of history. Though hampered by lack of materials and by political necessities, his strategy was daring always, and he never hesitated to take the gravest risks. On the field of battle he was as energetic in attack as he was constant in defence, and his personal influence over the men whom he led was extraordinary. No student of the American Civil War can fail to notice how the influence of Lee dominated the course of the struggle, and his surpassing ability was never more conspicuously shown than in the last hopeless stages of the contest. The personal history of Lee is lost in the history of the great crisis of America's national life; friends and foes alike acknowledged the purity of his motives, the virtues of his private life, his earnest Christianity and the unrepining loyalty with which he accepted the ruin of his party.

See A. L. Long, *Memoirs of Robert E. Lee* (New York, 1886); Fitzhugh Lee, *General Lee* (New York, 1894, "Great Commanders" series); R. A. Brock, *General Robert E. Lee* (Washington, 1904); R. E. Lee, *Recollections and Letters of General R. E. Lee* (London, 1904); H. A. White, *Lee* ("Heroes of the Nations") (1897); P. A. Bruce, *Robert E. Lee* (1907); T. N. Page, *Lee* (1909); W. H. Taylor, *Four Years with General Lee*; J. W. Jones, *Personal Reminiscences of Robert E. Lee* (1874).

**LEE** (or Legh) **ROWLAND** (d. 1543), English bishop, belonged to a Northumberland family and was educated at Cambridge. Having entered the Church he obtained several

livings owing to the favour of Cardinal Wolsey; after Wolsey's fall he rose high in the esteem of Henry VIII. and of Thomas Cromwell, serving both king and minister in the business of suppressing the monasteries, and he is said to have celebrated Henry's secret marriage with Anne Boleyn in January 1533. Whether this be so or not, Lee took part in preparing for the divorce proceedings against Catherine of Aragon, and in January 1534 he was elected bishop of Coventry and Lichfield, or Chester as the see was often called, taking at his consecration the new oath to the king as head of the English Church and not seeking confirmation from the pope. As bishop he remained in Henry's personal service, endeavouring to establish the legality of his marriage with Anne, until May 1534, when he was appointed lord president of the council in the marches of Wales. At this time the Welsh marches were in a very disorderly condition. Lee acted in a stern and energetic fashion, holding courts, sentencing many offenders to death and overcoming the hostility of the English border lords. After some years of hard and successful work in this capacity, "the last survivor of the old martial prelates, fitter for harness than for bishops' robes, for a court of justice than a court of theology," died at Shrewsbury in June 1543. Many letters from Lee to Cromwell are preserved in the Record Office, London; these throw much light on the bishop's career and on the lawless condition of the Welsh marches in his time.

One of his contemporaries was EDWARD LEE (*c.* 1482-1544) archbishop of York, famous for his attack on Erasmus, who replied to him in his *Epistolae aliquot eruditorum virorum*. Like Rowland, Edward was useful to Henry VIII. in the matter of the divorce of Catherine of Aragon, and was sent by the king on embassies to the emperor Charles V. and to Pope Clement VII. In 1531 he became archbishop of York, but he came under suspicion as one who disliked the king's new position as head of the English Church. At Pontefract in 1536, during the Pilgrimage of Grace, the archbishop was compelled to join the rebels, but he did not sympathize with the rising and in 1539 he spoke in parliament in favour of the six articles of religion. Lee, who was the last archbishop of York to coin money, died on the 13th of September 1544.

**LEE, SIDNEY** (1859- ), English man of letters, was born in London on the 5th of December 1859. He was educated at the City of London school, and at Balliol College, Oxford, where he graduated in modern history in 1882. In the next year he became assistant-editor of the *Dictionary of National Biography*. In 1890 he was made joint-editor, and on the retirement of Sir Leslie Stephen in 1891 succeeded him as editor. He was himself a voluminous contributor to the work, writing some 800 articles, mainly on Elizabethan authors or statesmen. While he was still at Balliol he wrote two articles on Shakespearian questions, which were printed in the *Gentleman's Magazine*, and in 1884 he published a book on Stratford-on-Avon. His article on Shakespeare in the fifty-first volume (1897) of the *Dictionary of National Biography* formed the basis of his *Life of William Shakespeare* (1898), which reached its fifth edition in 1905. Mr Lee edited in 1902 the Oxford facsimile edition of the first folio of *Shakespeare's Comedies, Histories and Tragedies*, followed in 1902 and 1904 by supplementary volumes giving details of extant copies, and in 1906 by a complete edition of Shakespeare's *Works*. Besides editions of English classics his works include a *Life of Queen Victoria* (1902), *Great Englishmen of the Sixteenth Century* (1904), based on his Lowell Institute lectures at Boston, Mass., in 1903, and *Shakespeare and the Modern Stage* (1906).



**LEE, SOPHIA** (1750-1824), English novelist and dramatist, daughter of John Lee (d. 1781), actor and theatrical manager, was born in London. Her first piece, *The Chapter of Accidents*, a one-act-opera based on Diderot's *Père de famille*, was produced by George Colman at the Haymarket Theatre on the 5th of August 1780. The proceeds were spent in

establishing a school at Bath, where Miss Lee made a home for her sisters. Her subsequent productions included *The Recess, or a Tale of other Times* (1785), a historical romance; and *Almeyda, Queen of Grenada* (1796), a tragedy in blank verse; she also contributed to her sister's *Canterbury Tales* (1797). She died at her house near Clifton on the 13th of March 1824.

Her sister, Harriet Lee (1757-1851), published in 1786 a novel written in letters, *The Errors of Innocence*. *Clara Lennox* followed in 1797. Her chief work is the *Canterbury Tales* (1797-1805), a series of twelve stories which became very popular. Lord Byron dramatized one of the tales, "Kruitzner," as *Werner, or the Inheritance*. She died at Clifton on the 1st of August 1851.

LEE, STEPHEN DILL (1833-1908), Confederate general in the American Civil War, came of a family distinguished in the history of South Carolina, and was born at Charleston, S.C., on the 22nd of September 1833. Graduating from West Point in 1854, he served for seven years in the United States army and resigned in 1861 on the secession of South Carolina. He was aide de camp to General Beauregard in the attack on Fort Sumter, and captain commanding a light battery in General Johnston's army later in the year 1861. Thereafter, by successive steps, each gained by distinguished conduct on the field of battle, he rose to the rank of brigadier-general in November 1862, being ordered to take command of defences at Vicksburg. He served at this place with great credit until its surrender to General Grant in July 1863, and on becoming a prisoner of war, he was immediately exchanged and promoted major-general. His regimental service had been chiefly with artillery, but he had generally worked with and at times commanded cavalry, and he was now assigned to command the troops of that arm in the south-western theatre of war. After harassing, as far as his limited numbers permitted, the advance of Sherman's column on Meridian, he took General Polk's place as commander of the department of Mississippi. In June 1864, on Hood's promotion to command the Army of Tennessee, S. D. Lee was made a lieutenant-general and assigned to command Hood's old corps in that army. He fought at Atlanta and Jonesboro and in the skirmishing and manœuvring along middle Tennessee which ended in the great crisis of Nashville and the "March to the Sea." Lee's corps accompanied Hood in the bold advance to Nashville, and fought in the battles of Franklin and Nashville, after which, in the rout of the Confederate army Lee kept his troops closed up and well in hand, and for three consecutive days formed the fighting rearguard of the otherwise disintegrated army. Lee was himself wounded, but did not give up the command until an organized rearguard took over the post of danger. On recovery he joined General J. E. Johnston in North Carolina, and he surrendered with Johnston in April 1865. After the war he settled in Mississippi, which was his wife's state and during the greater part of the war his own territorial command, and devoted himself to planting. He was president of the Agricultural and Mechanical College of Mississippi from 1880 to 1899, took some part in state politics and was an active member—at the time of his death commander-in-chief—of the "United Confederate Veterans" society. He died at Vicksburg on the 28th of May 1908.

LEE, a township of Berkshire county, in western Massachusetts, U.S.A. Pop. (1900) 3596; (1905) 3972; (1910) 4106. The township is traversed by the New York, New Haven & Hartford railway, covers an area of 22½ sq. m., and includes the village of Lee, 10 m. S. of Pittsfield, East Lee, adjoining it on the S.E., and South Lee, about 3 m. to the S.W. Lee and South Lee are on, and East Lee is near, the Housatonic river. The eastern part of the township is generally hilly, reaching a maximum altitude of about 2200 ft., and there are two considerable bodies of water—Laurel Lake in the N.W. (partly in Lenox) and Goose Pond, in the S.E. (partly in Tyringham). The region is healthy as well as beautiful, and is much

frequented as a summer resort. Memorial Hall was built in memory of the soldiers from Lee who died during the Civil War. The chief manufactures are paper and wire, and from the quarries near the village of Lee is obtained an excellent quality of marble; these quarries furnished the marble for the extension of the Capitol at Washington, for St Patrick's cathedral in New York City and for the Lee High School and the Lee Public Library (1908). Lime is quarried in the township. Lee was formerly a paper-manufacturing place of great importance. The first paper mill in the township was built in South Lee in 1806, and for a time more paper was made in Lee than in any other place in the United States; the Housatonic Mill in Lee was probably the first (1867) in the United States to manufacture paper from wood pulp.

The first settlement within the present township of Lee was made in 1760. The township was formed from parts of Great Barrington and Washington, was incorporated in 1777 and was named in honour of General Charles Lee (1731-1782). In the autumn of 1786 there was an encounter near the village of East Lee between about 250 adherents of Daniel Shays (many of them from Lee township) and a body of state troops under General John Paterson, wherein the Shays contingent paraded a bogus cannon (made of a yarn beam) with such effect that the state troops fled.

See Amory Gale, *History of the Town of Lee* (Lee, 1854), and *Lee, The Centennial Celebration and Centennial History of the Town of Lee* (Springfield, Mass., 1878), compiled by Charles M. Hyde and Alexander Hyde.

**LEE.** (1) (In O. Eng. *hléo*; cf. the pronunciation *lew-ward* of "leeward"; the word appears in several Teutonic languages; cf. Dutch *lij*, Dan. *lae*), properly a shelter or protection, chiefly used as a nautical term for that side of a ship, land, &c., which is farthest from the wind, hence a "lee shore," land under the lee of a ship, *i.e.* one on which the wind blows directly and which is unsheltered. A ship is said to make "leeway" when she drifts laterally away from her course. (2) A word now always used in the plural "lees," meaning dregs, sediment, particularly of wine. It comes through the O. Fr. *lie* from a Gaulish Lat. *lia*, and is probably of Celtic origin.

**LEECH, JOHN** (1817-1864), English caricaturist, was born in London on the 29th of August 1817. His father, a native of Ireland, was the landlord of the London Coffee House on Ludgate Hill, "a man," on the testimony of those who knew him, "of fine culture, a profound Shakespearian, and a thorough gentleman." His mother was descended from the family of the famous Richard Bentley. It was from his father that Leech inherited his skill with the pencil, which he began to use at a very early age. When he was only three, he was discovered by Flaxman, who had called on his parents, seated on his mother's knee, drawing with much gravity. The sculptor pronounced his sketch to be wonderful, adding, "Do not let him be cramped with lessons in drawing; let his genius follow its own bent; he will astonish the world"—an advice which was strictly followed. A mail-coach, done when he was six years old, is already full of surprising vigour and variety in its galloping horses. Leech was educated at Charterhouse, where Thackeray, his lifelong friend, was his schoolfellow, and at sixteen he began to study for the medical profession at St Bartholomew's Hospital, where he won praise for the accuracy and beauty of his anatomical drawings. He was then placed under a Mr Whittle, an eccentric practitioner, the original of "Rawkins" in Albert Smith's *Adventures of Mr Ledbury*, and afterwards under Dr John Cockle; but gradually the true bent of the youth's mind asserted itself, and he drifted into the artistic profession. He was eighteen when his first designs were published, a quarto of four pages, entitled *Etchings and Sketchings by A. Pen, Esq.*, comic character studies from the London streets. Then he drew some political lithographs, did rough sketches for *Bell's Life*, produced an exceedingly

popular parody on Mulready's postal envelope, and, on the death of Seymour, applied unsuccessfully to illustrate the *Pickwick Papers*. In 1840 Leech began his contributions to the magazines with a series of etchings in *Bentley's Miscellany*, where Cruikshank had published his splendid plates to *Jack Sheppard* and *Oliver Twist*, and was illustrating *Guy Fawkes* in sadly feebler fashion. In company with the elder master Leech designed for the *Ingoldsby Legends* and *Stanley Thorn*, and till 1847 produced many independent series of etchings. These cannot be ranked with his best work; their technique is exceedingly imperfect; they are rudely bitten, with the light and shade out of relation; and we never feel that they express the artist's individuality, the *Richard Savage* plates, for instance, being strongly reminiscent of Cruikshank, and "The Dance at Stamford Hall" of Hablot Browne. In 1845 Leech illustrated *St Giles and St James* in Douglas Jerrold's newly started *Shilling Magazine*, with plates more vigorous and accomplished than those in *Bentley*, but it is in subjects of a somewhat later date, and especially in those lightly etched and meant to be printed with colour, that we see the artist's best powers with the needle and the acid. Among such of his designs are four charming plates to Dickens's *Christmas Carol* (1844), the broadly humorous etchings in the *Comic History of England* (1847-1848), and the still finer illustrations to the *Comic History of Rome* (1852)—which last, particularly in its minor woodcuts, shows some exquisitely graceful touches, as witness the fair faces that rise from the surging water in "Cloelia and her Companions Escaping from the Etruscan Camp." Among the other etchings which deserve very special reference are those in *Young Master Troublesome or Master Jacky's Holidays*, and the frontispiece to *Hints on Life, or How to Rise in Society* (1845)—a series of minute subjects linked gracefully together by coils of smoke, illustrating the various ranks and conditions of men, one of them—the doctor by his patient's bedside—almost equalling in vivacity and precision the best of Cruikshank's similar scenes. Then in the 'fifties we have the numerous etchings of sporting scenes, contributed, together with woodcuts, to the *Handley Cross* novels.

Turning to Leech's lithographic work, we have, in 1841, the *Portraits of the Children of the Mobility*, an important series dealing with the humorous and pathetic aspects of London street Arabs, which were afterwards so often and so effectively to employ the artist's pencil. Amid all the squalor which they depict, they are full of individual beauties in the delicate or touching expression of a face, in the graceful turn of a limb. The book is scarce in its original form, but in 1875 two reproductions of the outline sketches for the designs were published—a lithographic issue of the whole series, and a finer photographic transcript of six of the subjects, which is more valuable than even the finished illustrations of 1841, in which the added light and shade is frequently spotty and ineffective, and the lining itself has not the freedom which we find in some of Leech's other lithographs, notably in the *Fly Leaves*, published at the *Punch* office, and in the inimitable subject of the nuptial couch of the Caudles, which also appeared, in woodcut form, as a political cartoon, with Mrs Caudle, personated by Brougham, disturbing by untimely loquacity the slumbers of the lord chancellor, whose haggard cheek rests on the woolsack for pillow.

But it was in work for the wood-engravers that Leech was most prolific and individual. Among the earlier of such designs are the illustrations to the *Comic English* and *Latin Grammars* (1840), to *Written Caricatures* (1841), to Hood's *Comic Annual*, (1842), and to Albert Smith's *Wassail Bowl* (1843), subjects mainly of a small vignette size, transcribed with the best skill of such woodcutters as Orrin Smith, and not, like the larger and later *Punch* illustrations, cut at speed by several engravers working at once on the subdivided block. It was in 1841 that Leech's connexion with *Punch* began, a connexion which subsisted till his death on the 29th of October 1864, and resulted in the production of the best-known and most admirable of his designs. His first contribution appeared in the issue of the 7th of August, a full-page illustration—entitled "Foreign Affairs"—of character studies from the neighbourhood of Leicester Square. His cartoons deal at first mainly with social subjects, and are rough and imperfect in execution, but gradually their method gains in power and their subjects become more distinctly political, and by 1849 the artist is strong enough to produce the splendidly humorous national personification which appears in "Disraeli Measuring the British Lion." About 1845 we have the first of that long series of half-page and quarter-page pictures of life and manners, executed with a hand as gentle as it was skilful, containing, as Ruskin has said, "admittedly the finest definition and natural history of the classes of our society, the kindest and subtlest analysis of its foibles, the tenderest flattery of its pretty and well-bred ways," which has yet appeared. In addition to his work for the weekly issue of *Punch*, Leech contributed largely to the *Punch* almanacks and pocket-books, to *Once a Week* from 1859 till 1862, to the *Illustrated London News*, where some of his largest and best sporting scenes appeared, and to innumerable novels and miscellaneous volumes besides, of which it is only necessary to specify *A Little Tour in Ireland* (1859),

which is noticeable as showing the artist's treatment of pure landscape, though it also contains some of his daintiest figure-pieces, like that of the wind-blown girl, standing on the summit of a pedestal, with the swifts darting around her and the breadth of sea beyond.

In 1862 Leech appealed to the public with a very successful exhibition of some of the most remarkable of his *Punch* drawings. These were enlarged by a mechanical process, and coloured in oils by the artist himself, with the assistance and under the direction of his friend J. E. Millais.

Leech was a singularly rapid and indefatigable worker. Dean Hole tells us, when he was his guest, "I have known him send off from my house three finished drawings on the wood, designed, traced, and rectified, without much effort as it seemed, between breakfast and dinner." The best technical qualities of Leech's art, his unerring precision, his unfailing vivacity in the use of the line, are seen most clearly in the first sketches for his woodcuts, and in the more finished drawings made on tracing-paper from these first outlines, before the chiaroscuro was added and the designs were transcribed by the engraver. Turning to the mental qualities of his art, it would be a mistaken criticism which ranked him as a comic draughtsman. Like Hogarth he was a true humorist, a student of human life, though he observed humanity mainly in its whimsical aspects,

"Hitting all he saw with shafts
With gentle satire, kin to charity,
That harmed not."

The earnestness and gravity of moral purpose which is so constant a note in the work of Hogarth is indeed far less characteristic of Leech, but there are touches of pathos and of tragedy in such of the *Punch* designs as the "Poor Man's Friend" (1845), and "General Février turned Traitor" (1855), and in "The Queen of the Arena" in the first volume of *Once a Week*, which are sufficient to prove that more solemn powers, for which his daily work afforded no scope, lay dormant in their artist. The purity and manliness of Leech's own character are impressed on his art. We find in it little of the exaggeration and grotesqueness, and none of the fierce political enthusiasm, of which the designs of Gillray are so full. Compared with that of his great contemporary George Cruikshank, his work is restricted both in compass of subject and in artistic dexterity.

Biographies of Leech have been written by John Brown (1882), and Frith (1891); see also "John Leech's Pictures of Life and Character," by Thackeray, *Quarterly Review* (December 1854); letter by John Ruskin, *Arrows of the Chace*, vol. i. p. 161; "Un Humoriste Anglais," by Ernest Chesneau, *Gazette des Beaux Arts* (1875).

(J. M. G.)

**LEECH,** the common name of members of the Hirudinea, a division of Chaetopod worms. It is doubtful whether the medicinal leech, *Hirudo medicinalis*, which is rarer in England than on the continent of Europe, or the horse leech, *Aulastoma gulo*, often confused with it, has the best right to the original possession of this name. But at present the word "leech" is applied to every member of the group Hirudinea, for the general structure and classification of which see CHAETOPODA. There are many genera and species of leeches, the exact definitions of which are still in need of a more complete survey. They occur in all parts of the world and are mostly aquatic, though sometimes terrestrial, in habit. The aquatic forms frequent streams, ponds and marshes, and the sea. The members of this group are always carnivorous or parasitic, and prey upon both vertebrates and invertebrates. In relation to their parasitic habit one or two suckers are always developed, the one at the anterior and the other at the posterior end of the body. In one subdivision of the leeches, the *Gnathobdellidae*, the mouth has three chitinous jaws which produce a triangular bite, though the action has been described as like that of a circular saw. Leeches without biting jaws possess a protrusible proboscis, and generally engulf their prey, as does the horse leech when it attacks earthworms. But some of them are also ectoparasites. The leech has been used in medicine from remote antiquity as a moderate blood-letter; and it is still so used, though more rarely than formerly. As unlicensed blood-letters, certain land-leeches are among the most unpleasant of parasites that can be encountered in a tropical jungle. A species of *Haemadipsa* of Ceylon attaches itself to the passer-by and draws blood with so

little irritation that the sufferer is said to be aware of its presence only by the trickling from the wounds produced. Small leeches taken into the mouth with drinking-water may give rise to serious symptoms by attaching themselves to the fauces and neighbouring parts and thence sucking blood. The effects of these parasites have been mistaken for those of disease. All leeches are very extensile and can contract the body to a plump, pear-shaped form, or extend it to a long and worm-like shape. They frequently progress after the fashion of a "looper" caterpillar, attaching themselves alternately by the anterior and the posterior sucker. Others swim with eel-like curves through the water, while one land-leech, at any rate, moves in a gliding way like a land Planarian, and leaves, also like the Planarian, a slimy trail behind it. Leeches are usually olive green to brown in colour, darker patches and spots being scattered over a paler ground. The marine parasitic leech *Pontobdella* is of a bright green, as is also the land-leech *Trocheta*.

The term "leech," as an old English synonym for physician, is from a Teutonic root meaning "heal," and is etymologically distinct from the name (O. Eng. *lyce*) of the *Hirudo*, though the use of the one by the other has helped to assimilate the two words.

(F. E. B.)

## LEEDS, THOMAS OSBORNE, 1st Duke of

(1631-1712), English statesman, commonly known also by his earlier title of Earl of Danby, son of Sir Edward Osborne, Bart., of Kiveton, Yorkshire, was born in 1631. He was great-grandson of Sir Edward Osborne (d. 1591), lord mayor of London, who, according to the accepted account, while apprentice to Sir William Hewett, cloth worker and lord mayor in 1559, made the fortunes of the family by leaping from London Bridge into the river and rescuing Anne (d. 1585), the daughter of his employer, whom he afterwards married.[1] Thomas Osborne, the future lord treasurer, succeeded to the baronetcy and estates in Yorkshire on his father's death in 1647, and after unsuccessfully courting his cousin Dorothy Osborne, married Lady Bridget Bertie, daughter of the earl of Lindsey. He was introduced to public life and to court by his neighbour in Yorkshire, George, 2nd duke of Buckingham, was elected M.P. for York in 1665, and gained the "first step in his future rise" by joining Buckingham in his attack on Clarendon in 1667. In 1668 he was appointed joint treasurer of the navy with Sir Thomas Lyttelton, and subsequently sole treasurer. He succeeded Sir William Coventry as commissioner for the state treasury in 1669, and in 1673 was appointed a commissioner for the admiralty. He was created Viscount Osborne in the Scottish peerage on the 2nd of February 1673, and a privy councillor on the 3rd of May. On the 19th of June, on the resignation of Lord Clifford, he was appointed lord treasurer and made Baron Osborne of Kiveton and Viscount Latimer in the peerage of England, while on the 27th of June 1674 he was created earl of Danby, when he surrendered his Scottish peerage of Osborne to his second son Peregrine Osborne. He was appointed the same year lord-lieutenant of the West Riding of Yorkshire, and in 1677 received the Garter.

Danby was a statesman of very different calibre from the leaders of the Cabal ministry, Buckingham and Arlington. His principal aim was no doubt the maintenance and increase of his own influence and party, but his ambition corresponded with definite political views. A member of the old cavalier party, a confidential friend and correspondent of the despotic Lauderdale, he desired to strengthen the executive and the royal authority. At the same time he was a keen partisan of the established church, an enemy of both Roman Catholics and dissenters, and an opponent of all toleration. In 1673 he opposed the Indulgence, supported the Test Act, and spoke against the proposal for giving relief to the dissenters. In June 1675 he signed the paper of advice drawn up by the bishops for the king, urging the rigid enforcement of the laws against the Roman Catholics, their complete banishment from the court, and the suppression of conventicles,[2] and a bill introduced by him imposing special taxes on recusants and subjecting Roman Catholic priests to imprisonment for life was only thrown out as too lenient because it secured offenders from the charge of treason. The same year he introduced a Test Oath by which all holding office or seats in either House of Parliament were to declare resistance to the royal power a crime, and promise to abstain from all attempts to alter the government of either church or state; but this extreme measure of retrograde toryism was successfully opposed by wiser statesmen. The king himself as a Roman Catholic secretly opposed and also doubted the wisdom and

practicability of this “thorough” policy of repression. Danby therefore ordered a return from every diocese of the numbers of dissenters, both Romanist and Protestant, in order by a proof of their insignificance to remove the royal scruples.[3] In December 1676 he issued a proclamation for the suppression of coffee-houses because of the “defamation of His Majesty’s Government” which took place in them, but this was soon withdrawn. In 1677, to secure Protestantism in case of a Roman Catholic succession, he introduced a bill by which ecclesiastical patronage and the care of the royal children were entrusted to the bishops; but this measure, like the other, was thrown out.

In foreign affairs Danby showed a stronger grasp of essentials. He desired to increase English trade, credit and power abroad. He was a determined enemy both to Roman influence and to French ascendancy. He terminated the war with Holland in 1674, and from that time maintained a friendly correspondence with William; while in 1677, after two years of tedious negotiations, he overcame all obstacles, and in spite of James’s opposition, and without the knowledge of Louis XIV., effected the marriage between William and Mary that was the germ of the Revolution and the Act of Settlement. This national policy, however, could only be pursued, and the minister could only maintain himself in power, by acquiescence in the king’s personal relations with the king of France settled by the disgraceful Treaty of Dover in 1670, which included Charles’s acceptance of a pension, and bound him to a policy exactly opposite to Danby’s, one furthering French and Roman ascendancy. Though not a number of the Cabal ministry, and in spite of his own denial, Danby must, it would seem, have known of these relations after becoming lord treasurer. In any case, in 1676, together with Lauderdale alone, he consented to a treaty between Charles and Louis according to which the foreign policy of both kings was to be conducted in union, and Charles received an annual subsidy of £100,000. In 1678 Charles, taking advantage of the growing hostility to France in the nation and parliament, raised his price, and Danby by his directions demanded through Ralph Montagu (afterwards duke of Montagu) six million livres a year (£300,000) for three years. Simultaneously Danby guided through parliament a bill for raising money for a war against France; a league was concluded with Holland, and troops were actually sent there. That Danby, in spite of these compromising transactions, remained in intention faithful to the national interests, appears clearly from the hostility with which he was still regarded by France. In 1676 he is described by Ruvigny to Louis XIV. as intensely antagonistic to France and French interests, and as doing his utmost to prevent the treaty of that year.[4] In 1678, on the rupture of relations between Charles and Louis, a splendid opportunity was afforded Louis of paying off old scores by disclosing Danby’s participation in the king’s demands for French gold.



Every circumstance now conspired to effect his fall. Although both abroad and at home his policy had generally embodied the wishes of the ascendant party in the state, Danby had never obtained the confidence of the nation. His character inspired no respect, and he could not reckon during the whole of his long career on the support of a single individual. Charles is said to have told him when he made him treasurer that he had only two friends in the world, himself and his own merit.[5] He was described to Pepys on his acquiring office as “one of a broken sort of people that have not much to lose and therefore will venture all,” and as “a beggar having £1100 or £1200 a year, but owes above £10,000.” His office brought him in £20,000 a year,[6] and he was known to be making large profits by the sale of offices; he maintained his power by corruption and by jealously excluding from office men of high standing and ability. Burnet described him as “the most hated minister that had ever been about the king.” Worse men had been less detested, but Danby had none of the amiable virtues which often counteract the odium incurred by serious faults. Evelyn, who knew him intimately from his youth, describes him as “a man of excellent natural parts but nothing of generous or grateful.” Shaftesbury, doubtless no friendly witness, speaks of him as an inveterate liar, “proud, ambitious, revengeful, false, prodigal and covetous to the highest degree,”[7] and Burnet supports his unfavourable judgment to a great extent. His corruption, his mean submission to a tyrant wife, his greed, his pale face and lean person, which had succeeded to the handsome features and comeliness of earlier days,[8] were the subject of ridicule, from the witty sneers of Halifax to the coarse jests of the anonymous writers of innumerable lampoons. By his championship of the national policy he had raised up formidable foes abroad without securing a single friend or supporter at home,[9] and his fidelity to the national interests was now, through a very mean and ignoble act of personal spite, to be the occasion of his downfall.

Danby in appointing a new secretary of state had preferred Sir W. Temple, a strong adherent of the anti-French policy, to Montagu. The latter, after a quarrel with the duchess of Cleveland, was dismissed from the king’s employment. He immediately went over to the

opposition, and in concert with Louis XIV. and Barillon, the French ambassador, by whom he was supplied with a large sum of money, arranged a plan for effecting Danby's ruin. He obtained a seat in parliament; and in spite of Danby's endeavour to seize his papers by an order in council, on the 20th of December 1678 caused two of the incriminating letters written by Danby to him to be read aloud to the House of Commons by the Speaker. The House immediately resolved on Danby's impeachment. At the foot of each of the letters appeared the king's postscripts, "I approve of this letter. C.R.," in his own handwriting; but they were not read by the Speaker, and were entirely neglected in the proceedings against the minister, thus emphasizing the constitutional principle that obedience to the orders of the sovereign can be no bar to an impeachment. He was charged with having encroached to himself royal powers by treating matters of peace and war without the knowledge of the council, with having promoted the raising of a standing army on pretence of a war with France, with having obstructed the assembling of parliament, with corruption and embezzlement in the treasury. Danby, while communicating the "Popish Plot" to the parliament, had from the first expressed his disbelief in the so-called revelations of Titus Oates, and his backwardness in the matter now furnished an additional charge of having "traitorously concealed the plot." He was voted guilty by the Commons; but while the Lords were disputing whether the accused peer should have bail, and whether the charges amounted to more than a misdemeanour, parliament was prorogued on the 30th of December and dissolved three weeks later. In March 1679 a new parliament hostile to Danby was returned, and he was forced to resign the treasurership; but he received a pardon from the king under the Great Seal, and a warrant for a marquessate.[10] His proposed advancement in rank was severely reflected upon in the Lords, Halifax declaring it in the king's presence the recompense of treason, "not to be borne"; and in the Commons his retirement from office by no means appeased his antagonists. The proceedings against him were revived, a committee of privileges deciding on the 19th of March 1679 that the dissolution of parliament was no abatement of an impeachment. A motion was passed for his committal by the Lords, who, as in Clarendon's case, voted his banishment. This was, however, rejected by the Commons, who now passed an act of attainder. Danby had removed to the country, but returned on the 21st of April to avoid the threatened passing by the Lords of the attainder, and was sent to the Tower. In his written defence he now pleaded the king's pardon, but on the 5th of May 1679 it was pronounced illegal by the Commons. This declaration was again repeated by the Commons in 1689 on the occasion of another attack made upon Danby in that year, and was finally embodied in the Act of Settlement in 1701.

The Commons now demanded judgment against the prisoner from the Lords. Further proceedings, however, were stopped by the dissolution of parliament again in July; but for nearly five years Danby remained a prisoner in the Tower. A number of pamphlets asserting the complicity of the fallen minister in the Popish Plot, and even accusing him of the murder of Sir Edmund Berry Godfrey, were published in 1679 and 1680; they were answered by Danby's secretary, Edward Christian, in *Reflections*; and in May 1681 Danby was actually indicted by the Grand Jury of Middlesex for Godfrey's murder on the accusation of Edward FitzHarris. His petition to the king for a trial by his peers on this indictment was refused, and an attempt to prosecute the publishers of the false evidence in the king's bench was unsuccessful. For some time all appeals to the king, to parliament, and to the courts of justice were unavailing; but on the 12th of February 1684 his application to Chief Justice Jeffreys was at last successful, and he was set at liberty on finding bail to the amount of £40,000, to appear in the House of Lords in the following session. He visited the king at court the same day; but took no part in public affairs for the rest of the reign.

After James's accession Danby was discharged from his bail by the Lords on the 19th of May 1685, and the order declaring a dissolution of parliament to be no abatement of an impeachment was reversed. He again took his seat in the Lords as a leader of the moderate Tory party. Though a strong Tory and supporter of the hereditary principle, James's attacks on Protestantism soon drove him into opposition. He was visited by Dykvelt, William of Orange's agent; and in June 1687 he wrote to William assuring him of his support. On the 30th of June 1688 he was one of the seven leaders of the Revolution who signed the invitation to William. In November he occupied York in the prince's interest, returning to London to meet William on the 26th of December. He appears to have thought that William would not claim the crown,[11] and at first supported the theory that the throne having been vacated by James's flight the succession fell as of right to Mary; but as this met with little support, and was rejected both by William and by Mary herself, he voted against the regency and joined with Halifax and the Commons in declaring the prince and princess joint sovereigns.

Danby had rendered extremely important services to William's cause. On the 20th of April 1689 he was created marquess of Carmarthen and was made lord-lieutenant of the three ridings of Yorkshire. He was, however, still greatly disliked by the Whigs, and William, instead of reinstating him in the lord treasurership, only appointed him president of the council in February 1689. He did not conceal his vexation and disappointment, which were increased by the appointment of Halifax to the office of lord privy seal. The antagonism between the "black" and the "white marquess" (the latter being the nickname given to Carmarthen in allusion to his sickly appearance), which had been forgotten in their common hatred to the French policy and to Rome, revived in all its bitterness. He retired to the country and was seldom present at the council. In June and July new motions were made in parliament for his removal; but notwithstanding his great unpopularity, on the retirement of Halifax in 1690 he again acquired the chief power in the state, which he retained till 1695 by bribery in parliament and by the support of the king and queen. In 1690, during William's absence in Ireland, he was appointed Mary's chief adviser. In 1691, desiring to compromise Halifax, he discredited himself by the patronage of an informer named Fuller, soon proved an impostor. He was absent in 1692 when the Place Bill was thrown out. In 1693 he presided in great state as lord high steward at the trial of Lord Mohun; and on the 4th of May 1694 he was created duke of Leeds.[12] The same year he supported the Triennial Bill, but opposed the new treason bill as weakening the hands of the executive. Meanwhile fresh attacks had been made upon him. He was accused unjustly of Jacobitism. In April 1695 he was impeached once more by the Commons for having received a bribe of 5000 guineas to procure the new charter for the East India Company. In his defence, whilst denying that he had received the money and appealing to his past services, he did not attempt to conceal the fact that according to his experience bribery was an acknowledged and universal custom in public business, and that he himself had been instrumental in obtaining money for others. Meanwhile his servant, who was said to have been the intermediary between the duke and the Company in the transaction, fled the country; and no evidence being obtainable to convict, the proceedings fell to the ground. In May 1695 he had been ordered to discontinue his attendance at the council. He returned in October, but was not included among the lords justices appointed regents during William's absence in this year. In November he was created D.C.L. by the university of Oxford; in December he became a commissioner of trade, and in December 1696 governor of the Royal Fishery Company. He opposed the prosecution of Sir John Fenwick, but supported the action taken by members of both Houses in defence of William's rights in the same year. On the 23rd of April 1698 he entertained the tsar, Peter the Great, at Wimbledon. He had for some time lost the real direction of affairs, and in May 1699 he was compelled to retire from office and from the lord-lieutenancy of Yorkshire.

In Queen Anne's reign, in his old age, he is described as "a gentleman of admirable natural parts, great knowledge and experience in the affairs of his own country, but of no reputation with any party. He hath not been regarded, although he took his place at the council board."[13] The veteran statesman, however, by no means acquiesced in his enforced retirement, and continued to take an active part in politics. As a zealous churchman and Protestant he still possessed a following. In 1705 he supported a motion that the church was in danger, and in 1710 in Sacheverell's case spoke in defence of hereditary right.[14] In November of this year he obtained a renewal of his pension of £3500 a year from the post office which he was holding in 1694,[15] and in 1711 at the age of eighty was a competitor for the office of lord privy seal.[16] His long and eventful career, however, terminated soon afterwards by his death on the 26th of July 1712.

In 1710 the duke had published *Copies and Extracts of some letters written to and from the Earl of Danby ... in the years 1676, 1677 and 1678*, in defence of his conduct, and this was accompanied by *Memoirs relating to the Impeachment of Thomas, Earl of Danby*. The original letters, however, of Danby to Montagu have now been published (by the Historical MSS. Commission from the MSS. of J. Eliot Hodgkin), and are seen to have been considerably garbled by Danby for the purposes of publication, several passages being obliterated and others altered by his own hand.

See the lives, by Sidney Lee in the *Dict. Nat. Biography* (1895); by T. P. Courtenay in *Lardner's Encyclopaedia*, "Eminent British Statesmen," vol. v. (1850); in Lodge's *Portraits*, vii.; and *Lives and Characters of ... Illustrious Persons*, by J. le Neve (1714). Further material for his biography exists in *Add. MSS.*, 26040-95 (56 vols., containing his papers); in the *Duke of Leeds MSS. at Hornby Castle*, calendered in *Hist. MSS. Comm.* 11th Rep. pt. vii. pp. 1-43; *MSS. of Earl of Lindsay and J. Eliot Hodgkin*; and *Calendars of State Papers Dom*. See also *Add. MSS. 1894-1899*, Index and Calendar; *Hist. MSS. Comm.* 11th Rep. pt. ii., *House of Lords MSS.; Gen. Cat. British Museum* for various pamphlets.

(P. C. Y.)

The duke's only surviving son, Peregrine (1659-1729), who became 2nd duke of Leeds on his father's death, had been a member of the House of Lords as Baron Osborne since 1690, but he is better known as a naval officer; in this service he attained the rank of a vice-admiral. He died on the 25th of June 1729, when his son Peregrine Hyde (1691-1731) became 3rd duke. The 4th duke was the latter's son Thomas (1713-1789), who was succeeded by his son Francis.

Francis Osborne, 5th duke of Leeds (1751-1799), was born on the 29th of January 1751 and was educated at Westminster school and at Christ Church, Oxford. He was a member of parliament in 1774 and 1775; in 1776 he became a peer as Baron Osborne, and in 1777 lord chamberlain of the queen's household. In the House of Lords he was prominent as a determined foe of the prime minister, Lord North, who, after he had resigned his position as chamberlain, deprived him of the office of lord-lieutenant of the East Riding of Yorkshire in 1780. He regained this, however, two years later. Early in 1783 the marquess of Carmarthen, as he was called, was selected as ambassador to France, but he did not take up this appointment, becoming instead secretary for foreign affairs under William Pitt in December of the same year. As secretary he was little more than a cipher, and he left office in April 1791. Subsequently he took some slight part in politics, and he died in London on the 31st of January 1799. His *Political Memoranda* were edited by Oscar Browning for the Camden Society in 1884, and there are eight volumes of his official correspondence in the British Museum. His first wife was Amelia (1754-1784), daughter of Robert Darcy, 4th earl of Holdernesse, who became Baroness Conyers in her own right in 1778. Their elder son, George William Frederick (1775-1838), succeeded his father as duke of Leeds and his mother as Baron Conyers. These titles were, however, separated when his son, Francis Godolphin Darcy, the 7th Duke (1798-1859), died without sons in May 1859. The barony passed to his nephew, Sackville George Lane-Fox (1827-1888), falling into abeyance on his death in August 1888, and the dukedom passed to his cousin, George Godolphin Osborne (1802-1872), a son of Francis Godolphin Osborne (1777-1850), who was created Baron Godolphin in 1832. In 1895 George's grandson George Godolphin Osborne (b. 1862) became 10th duke of Leeds. The name of Godolphin, which is borne by many of the Osbornes, was introduced into the family through the marriage of the 4th duke with Mary (d. 1764), daughter and co-heiress of Francis Godolphin, 2nd earl of Godolphin, and grand-daughter of the great duke of Marlborough.

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1 *Chronicles of London Bridge*, by R. Thomson (1827), 313, quoting Stow.

2 *Cal. of St Pap. Dom.* (1673-1675), p. 449.

3 Letter of Morley, Bishop of Winchester, to Danby (June 10, 1676). (*Hist. MSS. Com.* xi. Rep. pt. vii. 14.)

4 *Memoirs of Great Britain and Ireland*, by Sir J. Dalrymple (1773), i. app. 104.

5 *Letters to Sir Joseph Williamson* (Camden Soc., 1874), i. 64.

6 Halifax note-book in Devonshire House collection, quoted in Foxcroft's *Life of Halifax*, ii. 63, note.

7 *Life of Shaftesbury*, by W. D. Christie (1871), ii. 312.

8 Macky's *Memoirs*, 46; Pepys's *Diary*, viii. 143.

9 See the description of his position at this time by Sir W. Temple in *Lives of Illustrious Persons* (1714), 40.

10 Add. MSS. 28094, f. 47.

11 Boyer's *Annals* (1722), 433.

12 The title was taken, not from Leeds in Yorkshire, but from Leeds in Kent, 4½ m. from Maidstone, which in the 17th century was a more important place than its Yorkshire namesake.

13 *Memoirs of Sir John Macky* (Roxburghe Club, 1895), 46.

14 Boyer's *Annals*, 219, 433.

15 *Harleian MSS.* 2264, No. 239.

16 Boyer's *Annals*, 515.

LEEDS, a city and municipal county and parliamentary borough in the West Riding of Yorkshire, England, 185 m. N.N.W. from London. Pop. (1891) 367,505; (1901) 428,968. It is served by the Great Northern railway (Central station), the Midland (Wellington station), North-Eastern and London & North-Western (New station), and Great Central and Lancashire & Yorkshire railways (Central station). It lies nearly in the centre of the Riding, in the valley of the river Aire.

The plan of the city is in no way regular, and the numerous handsome public buildings are distributed among several streets, principally on the north side of the narrow river. The town hall is a fine building in Grecian style, well placed in a square between Park Lane and Great George Street. It is of oblong shape, with a handsome façade over which rises a domed clock-tower. The principal apartment is the Victoria Hall, a richly ornamented chamber measuring 161 ft. in length, 72 in breadth and 75 in height. It was opened in 1858 by Queen Victoria. Immediately adjacent to it are the municipal offices (1884) in Italian style. The Royal Exchange (1872) in Boar Lane is an excellent Perpendicular building. In ecclesiastical architecture Leeds is not rich. The church of St John, however, is an interesting example of the junction of Gothic traditions with Renaissance tendencies in architecture. It dates from 1634 and contains some fine contemporary woodwork. St Peter's parish church occupies an ancient site, and preserves a very early cross from the former building. The church was rebuilt in 1840 at the instance of the vicar, Dr Walter Farquhar Hook (1798-1875), afterwards dean of Chichester, whose work here in a poor and ill-educated parish brought him fame. The church of All Souls (1880) commemorates him. It may be noted that the vicarage of Leeds has in modern times commonly formed a step to the episcopal bench. There are numerous other modern churches and chapels, of which the Unitarian chapel in Park Row is noteworthy. Leeds is the seat of a Roman Catholic bishop, with a pro-cathedral dedicated to St Anne. There is a large free library in the municipal offices, and numerous branch libraries are maintained. The Leeds old library is a private institution founded in 1768 by Dr Priestley, who was then minister of the Unitarian chapel. It occupies a building in Commercial Street. The Philosophical and Literary Society, established in 1820, possesses a handsome building in Park Row, known as the Philosophical Hall, containing a laboratory, scientific library, lecture room, and museum, with excellent natural history, geological and archaeological collections. The City Art Gallery was completed in 1888, and contains a fine permanent collection, while exhibitions are also held. The University, incorporated in 1904, grew out of Yorkshire College, established in 1875 for the purpose of supplying instruction in the arts and sciences which are applicable to the manufactures, engineering, mining and agriculture of the county. In 1887 it became one of the constituent colleges of Victoria University, Manchester, and so remained until its separate incorporation. The existing building was completed in 1885, and contains a hall of residence, a central hall and library, and complete equipments in all departments of instruction. New departments have been opened in extension of the original scheme, such as the medical department (1894). A day training college is a branch of the institution. The Mechanics' Institute (1865) occupies a handsome Italian building in Cookridge Street near the town hall. It comprises a lecture room, library, reading and class rooms; and day and evening classes and an art school are maintained. The grammar school, occupying a Gothic building (1858) at Woodhouse Moor, dates its foundation from 1552. It is largely endowed, and possesses exhibitions tenable at Oxford, Cambridge and Durham universities. There is a large training college for the Wesleyan Methodist ministry in the suburb of Headingley. The Yorkshire Ladies' Council of Education has as its object the promotion of female education, and the instruction of girls and women of the artisan class in domestic economy, &c. The general infirmary in Great George Street is a Gothic building of brick with stone dressings with a highly ornamental exterior by Sir Gilbert Scott, of whose work this is by no means the only good example in Leeds. The city possesses further notable buildings in its market-halls, theatres, clubs, &c.

Among open spaces devoted by the corporation to public use that of Woodhouse Moor is the principal one within the city, but 3 m. N.E. of the centre is Roundhay Park, a tract of 700 acres, beautifully laid out and containing a picturesque lake. In 1889 there came into the possession of the corporation the ground, lying 3 m. up the river from the centre of the city, containing the celebrated ruins of Kirkstall Abbey. The remains of this great foundation, of the middle of the 12th century, are extensive, and so far typical of the usual arrangement of Cistercian houses as to be described under the heading Abbey. The ruins are carefully

preserved, and form a remarkable contrast with the surrounding industrial district. Apart from Kirkstall there are few antiquarian remains in the locality. In Guildford Street, near the town hall, is the Red Hall, where Charles I. lay during his enforced journey under the charge of the army in 1647.

For manufacturing and commercial purposes the situation of Leeds is highly advantageous. It occupies a central position in the railway system of England. It has communication with Liverpool by the Leeds and Liverpool Canal, and with Goole and the Humber by the Aire and Calder Navigation. It is moreover the centre of an important coal and iron district. Though regarded as the capital of the great manufacturing district of the West Riding, Leeds is not in its centre but on its border. Eastward and northward the country is agricultural, but westward and southward lies a mass of manufacturing towns. The characteristic industry is the woollen manufacture. The industry is carried on in a great number of neighbouring townships, but the cloth is commonly finished or dressed in the city itself, this procedure differing from that of the wool manufacturers in Gloucestershire and the west of England, who carry out the entire process in one factory. Formerly much of the business between manufacturer and merchant was transacted in the cloth halls, which formed a kind of market, but merchants now order goods directly from the manufacturers. Artificial silk is important among the textile products. Subsidiary to these leading industries is the production of machine-made clothing, hats and caps. The leather trade of Leeds is the largest in England, though no sole leather is tanned. The supply comes chiefly from British India. Boots and shoes are extensively manufactured. The iron trade in its different branches rivals the woollen trade in wealth, including the casting of metal, and the manufacture of steam engines, steam wagons, steam ploughs, machinery, tools, nails, &c. Leeds was formerly famed for the production of artistic pottery, and specimens of old Leeds ware are highly prized. The industry lapsed about the end of the 18th century, but has been revived in modern times. Minor and less specialized industries are numerous.

The parliamentary borough is divided into five divisions (North, Central, South, East and West), each returning one member. The county borough was created in 1888. Leeds was raised to the rank of a city in 1893. The municipal borough is under a lord mayor (the title was conferred in 1897 on the occasion of Queen Victoria’s Diamond Jubilee), 16 aldermen and 48 councillors. Area, 21,572 acres.

Leeds (Loidis, Ledes) is mentioned by Bede as the district where the Northumbrian kings had a royal vill in 627, and where Oswy, king of Northumbria, defeated Penda, king of the Mercians, in 665. Before the Norman Conquest seven thanes held it of Edward the Confessor as seven manors, but William the Conqueror granted the whole to Ilbert de Lacy, and at the time of the Domesday Survey it was held of him by Ralph Paganel, who is said to have raised Leeds castle, possibly on the site of an earlier fortification. In 1207 Maurice Paganel constituted the inhabitants of Leeds free burgesses, granting them the same liberties as Robert de Lacy had granted to Pontefract, including the right of selling burgher land to whom they pleased except to religious houses, and freedom from toll. He also appointed as the chief officer of the town a reeve who was to be chosen by the lord of the manor, the burgesses being “more eligible if only they would pay as much as others for the office.” The town was incorporated by Charles I. in 1626 under the title of an alderman, 7 principal burgesses and 24 assistants. A second charter granted by Charles II. in 1661 appointed a mayor, 12 aldermen and 24 assistants, and is still the governing charter of the borough. The woollen manufacture is said to have been introduced into Leeds in the 14th century, and owing to the facilities for trade afforded by its position on the river Aire soon became an important industry. Camden, writing about 1590, says, “Leeds is rendered wealthy by its woollen manufactures,” and the incorporation charter of 1626 recites that “the inhabitants have for a long time exercised the art of making cloth.” The cloth was then, as it is now, made in the neighbouring villages and only finished and sold in the town. A successful attempt was made in the beginning of the 19th century by Mr William Hirst to introduce goods of a superior quality which were made and finished in his own factory. Other manufacturers followed his example, but their factories are now only used for the finishing process. The worsted trade which was formerly carried on to some extent has now almost disappeared. The spinning of flax by machinery was introduced early in the 19th century by Mr John Marshall, a Holbeck manufacturer, who was one of the first to apply Sir Richard Arkwright’s water frame, invented for cotton manufacture, to the spinning of linen yarn. The burgesses were represented in parliament by one member during the Commonwealth, but not again until by the Reform Act of 1832 they were allowed to return two members. In 1867 they were granted an additional member.



See James Wardell, *The Municipal History of the Borough of Leeds* (1846); J. D. Whitaker, *Loidis and Elmete: or an Attempt to illustrate the Districts described in these words by Bede* (1816); D. H. Atkinson, *Ralph Thoresby, the Topographer; his Town (Leeds) and Times*

(1885-1887).

LEEK, a market town in the Leek parliamentary division of Staffordshire, England, 157 m. N.W. from London, on the Churnet Valley branch of the North Staffordshire railway. Pop. of urban district (1901) 15,484. The town lies high in a picturesque situation near the head of the river Churnet. The church of St Edward the Confessor is mainly Decorated, and stands in a churchyard commanding a beautiful view from an elevation of some 640 ft. There is here a curious pillar of Danish work ornately carved. An institute contains a free library, lecture hall, art gallery and school of art. A grammar school was established in 1723. In the vicinity are ruins of the Cistercian abbey De la Croix, or Dieulacresse, erected in 1214 by Ralph de Blundevill, earl of Chester. The slight remains are principally embodied in a farm-house. The silk manufacture includes sewing silk, braids, silk buttons, &c. Cloud Hill, rising to 1190 ft. W. of the town, causes a curious phenomenon in the height of summer, the sun sinking behind one flank to reappear beyond the other, and thus appearing to set twice.

Leek (Lee, Leike, Leeke) formed part of the great estates of Ælfgar, earl of Mercia; it escheated to William the Conqueror who held it at the time of the Domesday Survey. Later it passed to the earls Palatine of Chester, remaining in their hands until Ralph de Blundevill, earl of Chester, gave it to the abbey of Dieulacresse, which continued to hold it until its dissolution. The same earl in a charter which he gave to the town (*temp.* John) calls it a borough and grants to his free burgesses various privileges, including freedom from toll throughout Cheshire. These privileges were confirmed by Richard, abbot of Dieulacresse, but the town received no royal charter and failed to establish its burghal position. The Wednesday market which is still held dates from a grant of John to the earl of Chester: in the 17th century it was very considerable. A fair, also granted by John, beginning on the third day before the Translation of Edward the Confessor is still held. The silk manufacture which can be traced to the latter part of the 17th century is thought to have been aided by the settlement in Leek of some Huguenots after the revocation of the Edict of Nantes. In the 17th and 18th centuries the town was famous for its ale. Prince Charles Edward passed through Leek on his march to Derby (1745) and again on his return journey to Scotland. A story in connexion with the Civil Wars is told to explain the expression “Now thus” occurring on the tombstone of a citizen, who by this meaningless answer to all questions sought escape on the plea of insanity.

LEEK, the *Allium Porrum* of botanists, a plant now considered as a mere variety of *Allium Ampeloprasum*, wild leek, produced by cultivation. The plant is probably of Eastern origin, since it was commonly cultivated in Egypt in the time of the Pharaohs, and is so to the present day; while as regards its first appearance in England both Tusser and Gerard—two of the earliest writers on this class of subjects, the former of whom flourished in the early part and the latter in the later part of the 16th century—speak of it as being then commonly cultivated and used.[1] The Romans, it would appear, made great use of the leek for savouring their dishes, as seems proved by the number of recipes for its use referred to by Celsius. Hence it is more than probable that it was brought to England by the Romans. Italy was celebrated for leeks in the time of Pliny (*H.N.* xix. c. 6), according to whom they were brought into great esteem through the emperor Nero, derisively surnamed “Porrophagus,” who used to eat them for several days in every month to clear his voice. The leek is very generally cultivated in Great Britain as an esculent, but more especially in Scotland and in Wales, being esteemed as an excellent and wholesome vegetable, with properties very similar to those of the onion, but of a milder character. In America it is not much cultivated except by market gardeners in the neighbourhood of large cities. The whole plant, with the exception of the fibrous roots, is used in soups and stews. The sheathing stalks of the leaves

lap over each other, and form a thickish stem-like base, which is blanched, and is the part chiefly preferred. These blanched stems are much employed in French cookery. They form an important ingredient in Scotch winter broth, and particularly in the national dish *cock-a-leekie*, and are also largely used boiled, and served with toasted bread and white sauce, as in the case of asparagus. Leeks are sown in the spring, earlier or later according to the soil and the season, and are planted out for the summer, being dropped into holes made with a stout dibble and left unfilled in order to allow the stems space to swell. When they are thus planted deeply the holes gradually fill up, and the base of the stem becomes blanched and prepared for use, a process aided by drawing up the earth round about the stems as they elongate. The leek is one of the most useful vegetables the cottager can grow, as it will supply him with a large amount of produce during the winter and spring. It is extremely hardy, and presents no difficulty in its cultivation, the chief point, as with all succulent esculents, being that it should be grown quickly upon well-enriched soil. The plant is of biennial duration, flowering the second year, and perishing after perfecting its seeds. The leek is the national symbol or badge of the Welsh, who wear it in their hats on St David's Day. The origin of this custom has received various explanations, all of which are more or less speculative.

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1 Tusser, in his verse for the month of March, writes:—

"Now leckes are in season, for pottage ful good,
And spareth the milck cow, and purgeth the blood,
These hauving with peason, for pottage in Lent,
Thou spareth both otemel and bread to be spent."

LEER, a town and river port in the Prussian province of Hanover, lying in a fertile plain on the right bank of the Leda near its confluence with the Ems, and at the junction of railways to Bremen, Emden and Münster. Pop. (1905) 12,347. The streets are broad, well paved, and adorned with many elegant buildings, among which are Roman Catholic, Lutheran and Calvinist churches, and a new town hall with a tower 165 ft. high. Among its educational establishments are a classical school and a school of navigation. Linen and woollen fabrics, hosiery, paper, cigars, soap, vinegar and earthenware are manufactured, and there are iron-foundries, distilleries, tanneries and shipbuilding yards. Many markets for horses and cattle are held. The transit trade from the regions traversed by the Westphalian and Oldenburg railways is considerable. The principal exports are cattle, horses, cheese, butter, honey, wax, flour, paper, hardware and Westphalian coal. Leer is one of the principal ports for steamboat communication with the North Sea watering-places of Borkum and Norderney. Leer is a very old place, although it only obtained municipal privileges in 1823. Near the town is the Plitenberg, formerly a heathen place of sacrifice.

LEEUWARDEN, the capital of the province of Friesland, Holland, on the canal between Harlingen and Groningen, 33 m. by rail W. of Groningen. Pop (1901) 32,203. It is one of the most prosperous towns in the country. To the name of the Frisian Hague, it is entitled as well by similarity of history as by similarity of appearance. As the Hague grew up round the court of the counts of Holland, so Leeuwarden round the court of the Frisian stadtholders; and, like the Hague, it is an exceptionally clean and attractive town, with parks, pleasure grounds, and drives. The old gates have been somewhat ruthlessly cleared away, and the site of the town walls on the north and west competes with the park called the Prince's Garden as a public pleasure ground. The Prince's Garden was originally laid out by William Frederick of Nassau in 1648, and was presented to the town by King William I. in

1819. The royal palace, which was the seat of the Frisian court from 1603 to 1747, is now the residence of the royal commissioner for Friesland. It was restored in 1816 and contains a portrait gallery of the Frisian stadtholders. The fine mansion called the Kanselary was begun in 1502 as a residence for the chancellor of George of Saxony (1539), governor of Friesland, but was only completed in 1571 and served as a court house until 1811. It was restored at the end of the 19th century to contain the important provincial library and national archives. Other noteworthy buildings are the picturesque weigh-house (1595), the town hall (1715), the provincial courts (1850), and the great church of St Jacob, once the church of the Jacobins, and the largest monastic church in the Netherlands. The splendid tombs of the Frisian stadtholders buried here (Louis of Nassau, Anne of Orange, and others) were destroyed in the revolution 1795. The unfinished tower of Oldehove dates from 1529-1532. The museum of the Frisian Society is of modern foundation and contains a collection of provincial antiquities, including two rooms from Hindeloopen, an ancient village of Friesland, some 16th- and 17th-century portraits, some Frisian works in silver of the 17th and 18th centuries, and a collection of porcelain and faience.

Leeuwarden is the centre of a flourishing trade, being easily accessible from all parts of the province by road, rail and canal. The chief business is in stock of every kind, dairy and agricultural produce and fresh-water fish, a large quantity of which is exported to France. The industries include boat-building and timber yards, iron-foundries, copper and lead works, furniture, organ, tobacco and other factories, and the manufacture of gold and silver wares. The town is first mentioned in documents of the 13th century.

## LEEUWENHOEK, or LEUWENHOEK, ANTHONY VAN (1632-1723), Dutch

microscopist, was born at Delft on the 24th of October 1632. For a short time he was in a merchant's office in Amsterdam, but early devoted himself to the manufacture of microscopes and to the study of the minute structure of organized bodies by their aid. He appears soon to have found that single lenses of very short focus were preferable to the compound microscopes then in use; and it is clear from the discoveries he made with these that they must have been of very excellent quality. His discoveries were for the most part made public in the *Philosophical Transactions* of the Royal Society, to the notice of which body he was introduced by R. de Graaf in 1673, and of which he was elected a fellow in 1680. He was chosen a corresponding member of the Paris Academy of Sciences in 1697. He died at his native place on the 26th of August 1723. Though his researches were not conducted on any definite scientific plan, his powers of careful observation enabled him to make many interesting discoveries in the minute anatomy of man, the higher animals and insects. He confirmed and extended M. Malpighi's demonstration of the blood capillaries in 1668, and six years later he gave the first accurate description of the red blood corpuscles, which he found to be circular in man but oval in frogs and fishes. In 1677 he described and illustrated the spermatozoa in dogs and other animals, though in this discovery Stephen Hamm had anticipated him by a few months; and he investigated the structure of the teeth, crystalline lens, muscle, &c. In 1680 he noticed that yeast consists of minute globular particles, and he described the different structure of the stem in monocotyledonous and dicotyledonous plants.

> His researches in the life-history of various of the lower forms of animal life were in opposition to the doctrine that they could be "produced spontaneously, or bred from corruption." Thus he showed that the weevils of granaries, in his time commonly supposed to be bred *from* wheat, as well as *in* it, are grubs hatched from eggs deposited by winged insects. His chapter on the flea, in which he not only describes its structure, but traces out the whole history of its metamorphoses from its first emergence from the egg, is full of interest—not so much for the exactness of his observations, as for its incidental revelation of the extraordinary ignorance then prevalent in regard to the origin and propagation of "this minute and despised creature," which some asserted to be produced from sand, others from dust, others from the dung of pigeons, and others from urine, but which he showed to be "endowed with as great perfection in its kind as any large animal," and proved to breed in the regular way of winged insects. He even noted the fact that the pupa of the flea is sometimes attacked and fed upon by a mite—an observation which suggested the well known lines of Swift. His attention having been drawn to the blighting of the young shoots of fruit-

trees, which was commonly attributed to the ants found upon them, he was the first to find the *Aphides* that really do the mischief; and, upon searching into the history of their generation, he observed the young within the bodies of their parents. He carefully studied also the history of the ant and was the first to show that what had been commonly reputed to be "ants' eggs" are really their pupae, containing the perfect insect nearly ready for emersion, whilst the true eggs are far smaller, and give origin to "maggots" or larvae. Of the sea-mussel, again, and other shell-fish, he argued (in reply to a then recent defence of Aristotle's doctrine by F. Buonanni, a learned Jesuit of Rome) that they are not generated out of the mud or sand found on the seashore or the beds of rivers at low water, but from spawn, by the regular course of generation; and he maintained the same to be true of the fresh-water mussel (*Unio*), whose ova he examined so carefully that he saw in them the rotation of the embryo, a phenomenon supposed to have been first discovered long afterwards. In the same spirit he investigated the generation of eels, which were at that time supposed, not only by the ignorant vulgar, but by "respectable and learned men," to be produced from dew without the ordinary process of generation. Not only was he the first discoverer of the rotifers, but he showed "how wonderfully nature has provided for the preservation of their species," by their tolerance of the drying-up of the water they inhabit, and the resistance afforded to the evaporation of the fluids of their bodies by the impermeability of the casing in which they then become enclosed. "We can now easily conceive," he says, "that in all rain-water which is collected from gutters in cisterns, and in all waters exposed to the air, animalcules may be found; for they may be carried thither by the particles of dust blown about by the winds."

Leeuwenhoek's contributions to the *Philosophical Transactions* amounted to one hundred and twelve; he also published twenty-six papers in the *Memoirs of the Paris Academy of Sciences*. Two collections of his works appeared during his life, one in Dutch (Leiden and Delft, 1685-1718), and the other in Latin (*Opera omnia s. Arcana naturae ope exactissimorum microscopiorum selecta*, Leiden, 1715-1722); and a selection from them was translated by S. Hoole and published in English (London, 1781-1798).

LEEWARD ISLANDS, a group in the West Indies. They derive their name from being less exposed to the prevailing N.E. trade wind than the adjacent Windward Islands. They are the most northerly of the Lesser Antilles, and form a curved chain stretching S.W. from Puerto Rico to meet St Lucia, the most northerly of the Windward Islands. They consist of the Virgin Islands, with St Kitts, Antigua, Montserrat, Guadeloupe, Dominica, Martinique and their various dependencies. The Virgin Islands are owned by Great Britain and Denmark, Holland having St Eustatius, with Saba, and part of St Martin. France possesses Guadeloupe, Martinique, St Bartholomew and the remainder of St Martin. The rest of the islands are British, and (with the exception of Sombrero, a small island used only as a lighthouse-station) form, under one governor, a colony divided into five presidencies, namely: Antigua (with Barbuda and Redonda), St Kitts (with Nevis and Anguilla), Dominica, Montserrat and the Virgin Islands. Total pop. (1901) 127,536. There is one federal executive council nominated by the crown, and one federal legislative council—ten nominated and ten elected members. Of the latter, four are chosen by the unofficial members of the local legislative council of Antigua, two by those of Dominica, and four by the non-official members of the local legislative council of St Kitts-Nevis. The federal legislative council meets once annually, usually at St John, Antigua.

LE FANU, JOSEPH SHERIDAN (1814-1873), Irish journalist and author, was born of an old Huguenot family at Dublin on the 28th of August 1814. He entered Trinity College, Dublin, in 1833. At an early age he had given proof of literary talent, and in 1837 he joined the staff of the *Dublin University Magazine*, of which he became later editor and

proprietor. In 1837 he produced the Irish ballad *Phaudhrig Croohore*, which was shortly afterwards followed by a second, *Shamus O'Brien*, successfully recited in the United States by Samuel Lover. In 1839 he became proprietor of the *Warder*, a Dublin newspaper, and, after purchasing the *Evening Packet* and a large interest in the *Dublin Evening Mail*, he combined the three papers under the title the *Evening Mail*, a weekly reprint from which was issued as the *Warder*. After the death of his wife in 1858 he lived in retirement, and his best work was produced at this period of his life. He wrote some clever novels, of a sensational order, in which his vigorous imagination and his Irish love of the supernatural have full play. He died in Dublin on the 7th of February 1873. His best-known novels are *The House by the Churchyard* (1863) and *Uncle Silas, a Tale of Bartram Haugh* (1864). *The Purcell Papers*, Irish stories dating from his college days, were edited with a memoir of the author by A. P. Graves in 1880.

LEFEBVRE, PIERRE FRANÇOIS JOSEPH, duke of Danzig (1755-1820), marshal of France, was born at Rouffach in Alsace on the 20th of October 1755. At the outbreak of the Revolution he was a sergeant in the Gardes françaises, and with many of his comrades of this regiment took the popular side. He distinguished himself by bravery and humanity in many of the street fights in Paris, and becoming an officer and again distinguishing himself—this time against foreign invaders—he was made a general of division in 1794. He took part in the Revolutionary Wars from Fleurus to Stokach, always resolute, strictly obedient and calm. At Stokach (1799) he received a severe wound and had to return to France, where he assisted Napoleon during the *coup d'état* of 18 Brumaire. He was one of the first generals of division to be made marshal at the beginning of the First Empire. He commanded the guard infantry at Jena, conducted the siege of Danzig 1806-1807 (from which town he received his title in 1808), commanded a corps in the emperor's campaign of 1808-1809 in Spain, and in 1809 was given the difficult task of commanding the Bavarian contingent, which he led in the containing engagements of Abensberg and Rohr and at the battle of Eckmühl. He commanded the Imperial Guard in Russia, 1812, fought through the last campaign of the Empire, and won fresh glory at Montmirail, Areis-sur-Aube and Champaubert. He was made a peer of France by Louis XVIII. but joined Napoleon during the Hundred Days, and was only amnestied and permitted to resume his seat in the upper chamber in 1819. He died at Paris on the 14th of September 1820. Marshal Lefebvre was a simple soldier, whose qualifications for high rank, great as they were, came from experience and not from native genius. He was incapable of exercising a supreme command, even of leading an important detachment, but he was absolutely trustworthy as a subordinate, as brave as he was experienced, and intensely loyal to his chief. He maintained to the end of his life a rustic simplicity of speech and demeanour. Of his wife (formerly a *blanchisseuse* to the Gardes Françaises) many stories have been told, but in so far as they are to her discredit they seem to be false, she being, like the marshal, a plain "child of the people."

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