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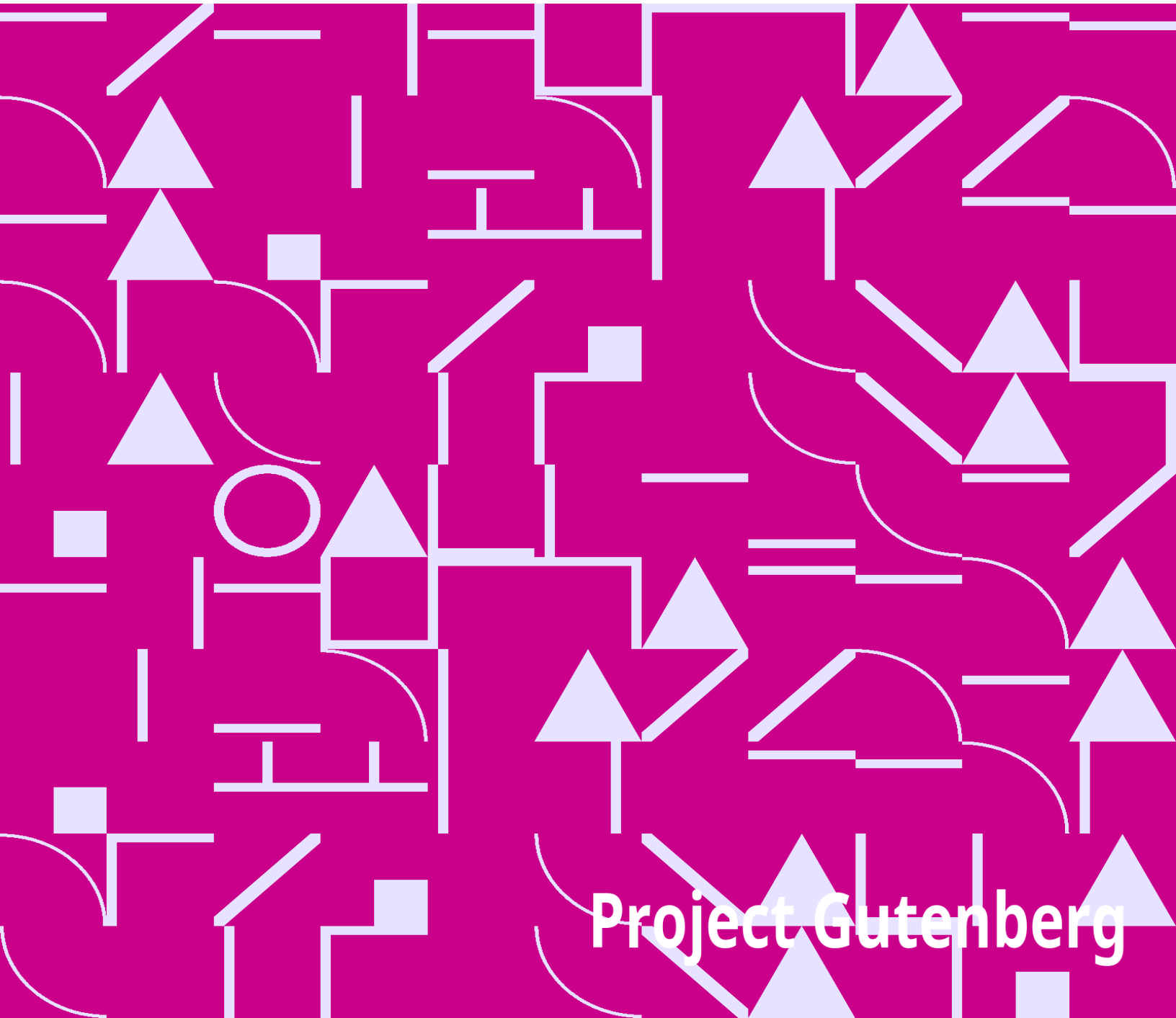

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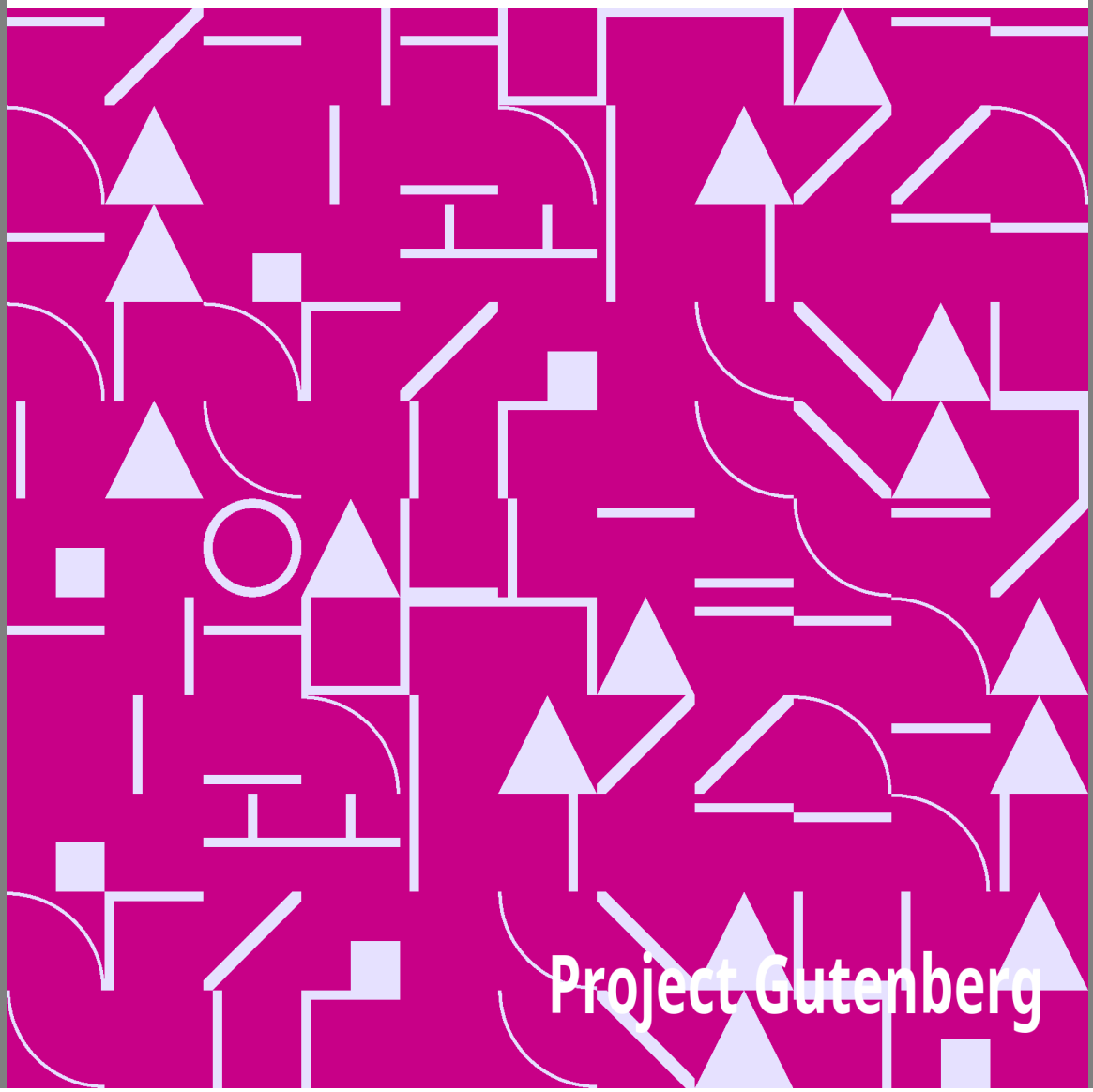

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THE ENCYCLOPÆDIA BRITANNICA

A DICTIONARY OF ARTS, SCIENCES, LITERATURE AND GENERAL INFORMATION

ELEVENTH EDITION

VOLUME XVII SLICE V

Malta to Map, Walter

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MALTA, the largest of the Maltese Islands, situated between Europe and Africa, in the central channel which connects the eastern and western basins of the Mediterranean Sea. The group belongs to the British Empire. It extends over 29 m., and consists of Malta, 91 sq. m., Gozo (*q.v.*) 20 sq. m., Comino (set apart as a quarantine station) 1 sq. m., and the uninhabited rocks called Cominotto and Filfla. Malta (lat. of Valletta Observatory 35° 53′ 55″ N., long. 14° 30′ 45″ W.) is about 60 m. from the nearest point of Sicily, 140 m. from the mainland of Europe and 180 from Africa; it has a magnificent natural harbour. From the dawn of maritime trade its possession has been important to the strongest nations on the sea for the time being.

Malta is about 17½ m. long by 8¼ broad; Gozo is 8¾ by 4½ m. This chain of islands stretches from N.E. to S.E. On the S.W. the declivities towards the sea are steep, and in places rise abruptly some 400 ft. from deep water. The general slope of these ridges is towards the N.W., facing Sicily and snow-capped Etna, the source of cool evening breezes. The Bingemma range, rising 726 ft., is nearly at right angles to the axis of the main island. The geological “Great Fault” stretches from sea to sea at the foot of these hills. There are good anchorages in the channels between Gozo and Comino, and between Comino and Malta. In addition to the harbours of Valletta, there are in Malta, facing N.W., the bays called Mellieha and St Paul’s, the inlets of the Salina, of Madalena, of St Julian and St Thomas; on the S.E. there is the large bay of Marsa Scirocco. There are landing places

on the S.W. at Fomh-il-rih and Miggiarro. Mount Sceberras (on which Valletta is built) is a precipitous promontory about 1 m. long, pointing N.E. It rises out of deep water; well-sheltered creeks indent the opposite shores on both sides. The waters on the S.E. form the "Grand Harbour," having a narrow entrance between Ricasoli Point and Fort St Elmo. The series of bays to the N.W., approached between the points of Tigne and St Elmo, is known as the Marsamuscetto (or Quarantine) Harbour.

Mighty fortifications and harbour works have assisted to make this ideal situation an emporium of Mediterranean trade. During the Napoleonic wars and the Crimean campaign the Grand Harbour was frequently overcrowded with shipping. The gradual supplanting of sail by steamships has made Malta a coaling station of primary importance. But the tendency to great length and size in modern vessels caused those responsible for the civil administration towards the end of the 19th century to realize that the harbour accommodation was becoming inadequate for modern fleets and first-class liners. A breakwater was therefore planned on the Monarch shoal, to double the available anchorage area and increase the frontage of deep-water wharves available in all weathers.

Geology and Water Supply.

The Maltese Islands consist largely of Tertiary Limestone, with somewhat variable beds of Crystalline Sandstone, Greensand and Marl or Blue Clay. The series appears to be in line with similar formations at Tripoli in Africa, Cagliari in Sardinia, and to the east of Marseilles. To the south-east of the Great Fault (already mentioned) the beds are more regular, comprising, in descending order, (*a*) Upper Coralline Limestone; (*b*) Yellow, Black or Greensand; (*c*) Marl or Blue Clay; (*d*) White, Grey and Pale Yellow Sandstone; (*e*) Chocolate-coloured nodules with shells, &c.; (*f*) Yellow Sandstone; (*g*) Lower Crystalline Limestone. The Lower Limestone probably belongs to the

Tongarian stage of the Oligocene series, and the Upper Coralline Limestone to the Tortonian stage of the Miocene. The beds are not folded. The general dip of the strata is from W.S.W. to E.N.E. North of the Great Fault and at Comino the level of the beds is about 400 ft. lower, bringing (*c*), the Marl, in juxtaposition with (*g*), the semi-crystalline Limestone. There is a system of lesser faults, parallel to the Great Fault, dividing the area into a number of blocks, some of which have fallen more than others. There are also indications of another series of faults roughly parallel to the south-east coast, which point to the islands being fragments of a former extensive plateau. The mammalian remains found in Pleistocene deposits are of exceptional interest. Among the more remarkable forms are a species of hippopotamus, the elephant (including a pigmy variety), and a gigantic dormouse. In the Coralline Limestone the following fossils have been noted:—*Spondylus*, *Ostrea*, *Pecten*, *Cytherea*, *Arca*, *Terebratula*, *Orthis*, *Clavagella*, *Echinus*, *Cidaris*, *Nucleolites*, *Brissus*, *Spatangus*; in the Marl the *Nautilus zigzag*; in the Yellow, Black and Greensand shells of *Lenticulites complanatus*, teeth and vertebrae of *Squalidae* and *Cetacea*; in the Sandstone *Vaginula depressa*, *Crystallaria*, *Nodosaria*, *Brissus*, *Nucleolites*, *Pecten burdigallensis*, *Scalaria*, *Scutella subrotunda*, *Spatangus*, *Nautilus*, *Ostrea navicularis* and *Pecten cristatus* (see Captain Spratt's work and papers by Lord Ducie and Dr Adams).

The Blue Clay forms, at the higher levels, a stratum impervious to water, and holds up the rainfall, which soaks through the spongy mass of the superimposed coralline formations. Hence arise the springs which run perennially, several of which have been collected into the gravitation water supplies of the Vignacourt and Fawara aqueducts. The larger part of the water supply, however, is now derived by pumping from strata at about sea-level. These strata are generally

impregnated with salt water, and are practically impenetrable to the rain-water of less weight. The honeycomb of rock, and capillary action, retard the lighter fresh-water from sinking to the sea; the soakage from rain has therefore to move horizontally, over the strata about sea-level, seeking outlets. At this stage the rain-water is intercepted by wells, and by galleries hewn for miles in the water-bearing rock. Large reservoirs assist to store this water after it is raised, and to equalize its distribution.

Climate and Hygiene.

The climate is, for the greater part of the year, temperate and healthy; the thermometer records an annual mean of 67° F. Between June and September the temperature ranges from 75° to 90°; the mean for December, January and February is 56°; March, May and November are mild. Pleasant north-east winds blow for an average of 150 days a year, cool northerly winds for 31 days, east winds 70 days, west for 34 days. The north-west “Gregale” (Euroclydon of Acts xxvii. 14) blows about the equinox, and occasionally, in the winter months, with almost hurricane force for three days together; it is recorded to have caused the drowning of 600 persons in the harbour in 1555. This wind has been a constant menace to shipping at anchor; the new breakwater on the Monarch Shoal was designed to resist its ravages. The regular tides are hardly perceptible, but, under the influence of barometric pressure and wind, the sea-level occasionally varies as much as 2 ft. The average rainfall is 21 in.; it is, however, uncertain; periods of drought have extended over three years. Snow is seen once or twice in a generation; violent hailstorms occur. On the 19th of October 1898, exceptionally large hailstones fell—one, over 4 in. in length, being brought to the governor, Sir Arthur Fremantle, for inspection. Mediterranean (sometimes called “Malta”) fever has been traced by Colonel David Bruce to a *Micrococcus melitensis*. The

supply of water under pressure is widely distributed and excellent. There is a modern system of drainage for the towns, and all sewerage has been intercepted from the Grand Harbour. There are efficient hospitals and asylums, a system of sanitary inspection, and modernized quarantine stations.

Flora.

It is hardly possible to differentiate between imported and indigenous plants. Among the marine flora may be mentioned *Porphyra laciniata*, the edible laver; *Codium tomentosum*, a coarse species; *Padina pavonia*, common in shallow water; *Ulva latissima*; *Haliseris polypodioides*; *Sargassum bacciferum*; the well-known gulf weed, probably transported from the Atlantic; *Zostera marina*, forming dense beds in muddy bays; the roots are cast up by storms and are valuable to dress the fields. Among the land plants may be noted the blue anemone; the ranunculus along the road-sides, with a strong perfume of violets; the Malta heath, which flowers at all seasons; *Cynomorium coccineum*, the curious "Malta fungus," formerly so valued for medicinal purposes that a guard was set for its preservation under the rule of the Knights; the pheasant's-eye; three species of mallow and geranium; *Oxalis cernua*, a very troublesome imported weed; *Lotus edulis*; *Scorpiurus subvillosa*, wild and cultivated as forage; two species of the horseshoe-vetch; the opium poppy; the yellow and claret-coloured poppy; wild rose; *Crataegus azarolus*, of which the fruit is delicious preserved; the ice-plant; squirting cucumber; many species of *Umbelliferae*; *Labiatae*, to which the spicy flavour of the honey (equal to that of Mt Hymettus) is ascribed; snap-dragons; broom-rape; glass-wort; *Salsola soda*, which produces when burnt a considerable amount of alkali; there are fifteen species of orchids; the *gladiolus* and *iris* are also found; *Urginia scilla*, the medicinal squill, abounds with its large bulbous roots near the sea;

seventeen species of sedges and seventy-seven grasses have been recorded.

Fauna.

There are four species of lizard and three snakes, none of which is venomous; a land tortoise, a turtle and a frog. Of birds very few are indigenous; the jackdaw, blue solitary thrush, spectacled warbler, the robin, kestrel and the herring-gull. A bird known locally as *Hangi*, not met elsewhere in Europe, nests at Filfla. Flights of quail and turtle doves, as well as teal and ducks, stay long enough to afford sport. Of migratory birds over two hundred species have been enumerated. The only wild mammalia in the island are the hedgehogs, two species of weasel, the Norway rat, and the domestic mouse. The Maltese dog was never wild and has ceased to exist as a breed.

Malta has several species of zoophytes, sponges, mollusca and crustacea. Insect life is represented by plant-bugs, locusts, crickets, grasshoppers, cockroaches, dragon-flies, butterflies, numerous varieties of moths, bees and mosquitoes.

Among the fish may be mentioned the tunny, dolphin, mackerel, sardine, sea-bream, dentice and pagnell; wrasse, of exquisite rainbow hue and good for food; members of the herring family, sardines, anchovies, flying-fish, sea-pike; a few representatives of the cod family, and some flat fish; soles (very rare); *Cernus* which grows to large size; several species of grey and red mullet; eleven species of *Triglidae*, including the beautiful flying gurnard whose colours rival the angel-fish of the West Indies; and eighteen species of mackerel, all migratory.

The real population of Malta, viz. of the country districts, is to be differentiated from the cosmopolitan fringe of the cities. There is continuous historical evidence that Malta remains to-day what Diodorus Siculus described it in the 1st century, "a colony of the Phoenicians"; this branch of the Caucasian race came down the great rivers to the Persian Gulf and thence to Palestine. It carried the art of navigation through the Mediterranean, along the Atlantic seaboard as far as Great Britain, leaving colonies along its path. In prehistoric times one of these colonies displaced

Population and Language.

previous inhabitants of Libyan origin. The similarity of the megalithic temples of Malta and of Stonehenge connect along the shores of western Europe the earliest evidence of Phoenician civilization. Philology proves that, though called "Canaanites" from having sojourned in that land, the Phoenicians have no racial connexion with the African descendants of Ham. No subsequent invader of Malta attempted to displace the Phoenician race in the country districts. The Carthaginians governed settlements of kindred races with a light hand; the Romans took over the Maltese as "dedititii," not as a conquered race. Their conversion by St Paul added difference of religion to the causes which prevented mixture of race. The Arabs from Sicily came to eject the Byzantine garrison; they treated the Maltese as friends, and were not sufficiently numerous to colonize. The Normans came as fellow-Christians and deliverers; they found very few Arabs in Malta. The fallacy that Maltese is a dialect of Arabia has been luminously disproved by A. E. Caruana, *Sull' origine della lingua Maltese*.

The upper classes have Norman, Spanish and Italian origin. The knights of St John of Jerusalem, commonly called "of Malta," were drawn from the nobility of Catholic Europe. They took vows of celibacy, but they frequently gave refuge in Malta to relatives driven to seek asylum from feudal wars and disturbances in their own lands. At the British occupation there were about two dozen families bearing titles of nobility granted, or recognized, by the Grand Masters, and descending by primogeniture. These "privileges" were guaranteed, together with the rights and religion of the islanders, when they became British subjects, but no government has ever recognized papal titles in Malta. High and low, all speak among themselves the Phoenician Maltese, altogether different from the Italian language; Italian was only spoken by 13.24% in 1901. Such Italian as is spoken by the lingering minority has marked divergences of pronunciation and inflexion from the language of Rome and Florence. In 1901, in addition to visitors

and the naval and military forces, 18,922 Maltese spoke English, and the number has been rapidly increasing.

In appearance the Maltese are a handsome, well-formed race, about the middle height, and well set up; they have escaped the negroid contamination noticeable in Sicily, and their features are less dark than the southern Italians. The women are generally smaller than the men, with black eyes, fine hair and graceful carriage. They are a thrifty and industrious people, prolific and devoted to their offspring, good-humoured, quick-tempered and impressionable. The food of the working classes is principally bread, with oil, olives, cheese and fruit, sometimes fish, but seldom meat; common wine is largely imported from southern Europe. The Maltese are strict adherents to the Roman Catholic religion, and enthusiastic observers of festivals, fasts and ceremonials.

In 1906 the birth-rate was 40.68 per thousand, and the excess of births over deaths 2637. In April 1907 the estimated population was 206,690 of whom 21,911 were in Gozo. This phenomenal congestion of population gives interest to records of its growth; in the 10th century there were 16,767 inhabitants in Malta and 4514 in Gozo; the total population in 1514 was 22,000. Estimates made at the arrival of the knights (1530) varied from 15,000 to 25,000: it was then necessary to import annually 10,000 quarters of grain from Sicily. The population in 1551 was, Malta 24,000, Gozo 7000. In 1582, 20,000 quarters of imported grain were required to avert famine. A census of 1590 makes the population 30,500; in that year 3000 died of want. The numbers rose in 1601 to 33,000; in 1614 to 41,084; in 1632 to 50,113; in 1667 to 55,155; in 1667 11,000 are said to have died of plague out of the total population. At the end of the rule of the knights (1798) the population was estimated at 100,000; sickness, famine and emigration during the blockade of the French in Valletta probably reduced the inhabitants to 80,000. In 1829 the population was 114,236; in 1836, 119,878

(inclusive of the garrison); in 1873, 145,605; at the census in 1901 the civil population was 184,742. Sanitation decreases the death-rate, religion keeps up the birth-rate. Nothing is done to promote emigration or to introduce manufactures.

Towns and Villages.—The capital is named after its founder, the Grand Master de la Valette, but from its foundation it has been called Valletta (pop. 1901, 24,685); it contains the palace of the Grand Masters, the magnificent Auberges of the several "Langues" of the Order, the unique cathedral of St John with the tombs of the Knights and magnificent tapestries and marble work; a fine opera house and hospital are conspicuous. Between the inner fortifications of Valletta and the outer works, across the neck of the peninsula, is the suburb of Floriana (pop. 7278). To the south-east of Valletta, at the other side of the Grand Harbour, are the cities of Senglea (pop. 8093), Vittoriosa (pop. 8993); and Cospicua (pop. 12,184); this group is often spoken of as "The Three Cities." The old capital, near the centre of the island is variously called Notabile, Città Vecchia (*q.v.*), and Medina, with its suburb Rabat, its population in 1901 was 7515; here are the catacombs and the ancient cathedral of Malta. Across the Marsamuscetto Harbour of Valletta is a considerable modern town called Sliema. The villages of Malta are Mellieha, St Paul's Bay, Musta, Birchircara, Lia, Atterd, Balzan, Naxaro, Gargur, Misida, S. Julian's, S. Giuseppe, Dingli, Zebbug, Siggieui, Curmi, Luca, Tarxein, Zurrico, Crendi, Micabbiba, Circop, Zabbar, Asciak, Zeitun, Gudia and Marsa Scirocco. The chief town of Gozo is called Victoria, and there are several small villages.

Industry and Trade.—The area under cultivation in 1906 was 41,534 acres. As a rule the tillers of the soil live away from their lands, in some neighbouring village. The fields are small and composed of terraces by which the soil has been walled up along the contours of the hills, with

enormous labour, to save it from being washed away. Viewed from the sea, the top of one wall just appearing above the next produces a barren effect; but the aspect of the land from a hill in early spring is a beautiful contrast of luxuriant verdure. It is estimated that there are about 10,000 small holdings averaging about four acres and intensely cultivated. The grain crops are maize, wheat and barley; the two latter are frequently sown together. In 1906, 13,000 acres produced 17,975 quarters of wheat and 12,000 quarters of barley. The principal fodder crops are green barley and a tall clover called "sulla" (*Hedysarum coronarum*), having a beautiful purple blossom. Vegetables of all sorts are easily grown, and a rotation of these is raised on land irrigated from wells and springs. Potatoes and onions are grown for exportation at seasons when they are scarce in northern Europe. The rent of average land is about £2 an acre, of very good land over £3; favoured spots, irrigated from running springs, are worth up to £12 an acre. Two, and often three, crops are raised in the year; on irrigated land more than twice as many croppings are possible. The presence of phosphates accounts for the fertility of a shallow soil. There is a considerable area under vines, but it is generally more profitable to sell the fruit as grapes than to convert it into wine. Some of the best oranges in the world are grown, and exported; but sufficient care is not taken to keep down insect pests, and to replace old trees. Figs, apricots, nectarines and peaches grow to perfection. Some cotton is raised as a rotation crop, but no care is taken to improve the quality. The caroub tree and the prickly pear are extensively cultivated. There are exceptionally fine breeds of cattle, asses and goats; cows of a large and very powerful build are used for ploughing. The supply of butchers' meat has to be kept up by constant importations. More than two-thirds of the wheat comes from abroad; fish, vegetables and fruit are also imported from Sicily in considerable quantities. Excellent honey is produced in Malta; at certain seasons tunny-fish and young dolphin (lampuca) are abundant; other varieties of fish are caught all the year round.

About 5000 women and children are engaged in producing Maltese lace. The weaving of cotton by hand-looms survives as a languishing industry. Pottery is manufactured on a small scale; ornamental carvings are made in Maltese stone and exported to a limited extent. The principal resources of Malta are derived from its being an important military station and the headquarters of the Mediterranean fleet. There are great naval docks, refitting yards, magazines and stores on the south-east side of the Grand Harbour; small vessels of war have also been built here. Steamers of several lines call regularly, and there is a daily mail to Syracuse. The shipping cleared in 1905-1906 was 3524 vessels of 3,718,168 tons. Internal communications include a railway about eight miles long from Valletta to Notabile; there are electric tramways and motor omnibus services in several directions. The currency is English. Local weights and measures include the cantar, 175 ℔; salm, one imperial quarter; cafiso, 4½ gallons; canna, 6 ft. 10½ in.; the tumolo (256 sq. ca.), about a third of an acre.

The principal exports of local produce are potatoes, cumin seed, vegetables, oranges, goats and sheep, cotton goods and stone.

To keep alive, in a fair standard of comfort, the population of 206,690, food supplies have to be imported for nine and a half months in the year. The annual value of exports would be set off against imported food for about one month and a half. The Maltese have to pay for food imports by imperial wages, earned in connexion with naval and military services, by commercial services to passing steamers and visitors, by earnings which emigrants send home from northern Africa and elsewhere, and by interest on investments of Maltese capital abroad. A long absence of the Mediterranean fleet, and withdrawals of imperial forces, produce immediate distress.

Finance.—The financial position in 1906-1907 is indicated by the following: Public revenue £513,594 (including £51,039 carried to

revenue from capital); expenditure £446,849; imports (actual), £1,219,819; imports in transit, £5,876,981; exports (actual), £123,510; exports in transit £6,127,277; imports from the United Kingdom (actual), £218,461. In March 1907 there were 8159 depositors in the government savings bank, with £569,731 to their credit.

Government.—Malta is a crown colony, within the jurisdiction of a high commissioner and a commander-in-chief, to whom important questions of policy are reserved; in other matters the administration is under a military governor (£3000), assisted by a civil lieutenant-governor or chief secretary. There is an executive council, now comprising eleven members with the governor as president. The legislative council, under letters patent of the 3rd of June 1903, is composed of the governor (president), ten official members, and eight elected members. There are eight electoral districts with a total of about 10,000 electors. A voter is qualified on an income from property of £6, or by paying rent to the same amount, or having the qualifications required to serve as a common juror. There are no municipal institutions. Letters patent, orders in council, and local ordinances have the force of law. The laws of Justinian are still the basis of the common law, the Code of Rohan is not altogether abrogated, and considerable weight is still given to the Roman Canon Law. The principal provisions of the Napoleonic Code and some English enactments have been copied in a series of ordinances forming the Statute Law. Latin was the language of the courts till 1784, and was not completely supplanted by Italian till 1815. The partial use of English (with illogical limitations to the detriment of the Maltese-born British subjects who speak English) was introduced by local ordinances and orders in council at the end of the 19th century. The Maltese, of whom 86% cannot understand Italian, are still liable to be tried, even for their lives, in Italian, to them a foreign language. The endeavour to restrict juries to those who understand Italian reveals glaring incongruities.

Education.—There were, in 1906, 98 elementary day schools, and 33 night schools. The attendance on the 1st of September 1905 was 16,530, the percentage on those enrolled 84.6; the total enrolment was 18,719. The average cost per pupil in these schools was 35s. 11d. a year on daily attendance. There is a secondary school for girls in Valletta, and one for boys in Gozo. A lyceum in Malta had an average attendance of 464. The number of students at the university was about 150. The average cost per student in the lyceum was £8, 0s. 11d.; in the university £26, 10s. 1d. The fees in these institutions are almost nominal, the middle-classes are thus educated at the expense of the masses. In the 18th century the government of the Knights and of the Inquisition did not favour the education of the people, after 1800 British governors were slow to make any substantial change. About the middle of the 19th century it began to be recognized that the education of the people was more conducive to the safety of the fortress than to leave in ignorance congested masses of southern race liable to be swayed spasmodically by prejudice. At first an attempt was made to make Maltese a literary language by adapting the Arabic characters to record it in print. This failed for several reasons, the foremost being that the language was not Arabic but Phoenician, and because professors and teachers, whose personal ascendancy was based on the official prominence of Italian, did not realize that educational institutions existed for the rising generation rather than to provide salaries for alien teachers and men behind the times. Various educational schemes were proposed, but they were easier to propose than to carry into effect: no one, except Mr Savona, had the ability to urge English as the basis of instruction, and he agitated and was installed as director of education and made a member of the Executive. The obstruction which he encountered alarmed him, and he compromised by adopting a mixed system of both English and Italian,

pari passu, as the basis of Maltese education; he resigned after a brief effort. Mr Savona's attempt to teach the Maltese children simultaneously two foreign languages (of which they were quite ignorant, and their teachers only partially conversant) without first teaching how to read and write the native Maltese systematically was continued for some years under an eminent archaeologist, Dr A. A. Caruana, who became Director of Education. He began to give some preference to English indirectly. On his resignation Sir G. Strickland established a new system of education based on the principle of beginning from the bottom, by teaching to read and write in Maltese as the medium for assimilating, at a further stage, either English or Italian, one at a time, and aiming at imparting general knowledge in colloquial English. A series of school books, in the Maltese language printed in Roman characters, with translations in English interlined in different type, was produced at the government printing office and sold at cost price. The parents and guardians were called upon to select whether each child should learn English or Italian next after learning reading, writing and arithmetic in Maltese. About 89% recorded their preference in favour of English at the outset; then, as a result of violent political agitation, this percentage was considerably lowered, but soon crept up again. Teachers and professors who were weak in English, lawyers, newspaper men and others, combined to deprive these reforms of their legitimate consequence, viz. that after a number of years English should be the language of the courts as well as of education, and to protect those belonging to the old order of knowledge from the competition of young Maltese better educated than themselves, whose rapid rise everywhere would be assured by knowing English thoroughly. An order in council was enacted in 1899 providing that no Maltese (except students of theology) should thenceforth suffer any detriment through inability to pass examinations in Italian, in either the

schools or university, but the fraction of the Maltese who claim to speak Italian (13.24%) still command sufficient influence to hamper the full enjoyment of this emancipation by the majority. In the university most of the textbooks used are English, nevertheless many of the lectures are still delivered in Italian—for the convenience of some professors or to please the politicians, rather than for the benefit of the students. The number of students who enter the university without passing any examination in Italian is rapidly increasing; the longer the period of transition, the greater the detriment to the rising generation.

History and Antiquities.—The earliest inhabitants of Malta (Melita) and Gozo (Gaulos) belonged to a culture-circle which included the whole of the western Mediterranean, and to a race which perhaps originated from North Africa; and it is they, and not the Phoenicians, who were the builders of the remarkable megalithic monuments which these islands contain, the Gigantia in Gozo, Hagiar Kim and Mnaidra near Crendi, the rock-cut hypogeum of Halsaflieni,[1] and the megalithic buildings on the hill of Corradino in Malta, being the most noteworthy. The contemporaneity of these structures has been demonstrated by the identity of the pottery and other objects discovered in them, including some remarkable steatopygic figures in stone, and it is clear that they belong to the neolithic period, numerous flints, but no metal, having been found. Those that have been mentioned seem to have been sanctuaries (some of them in part dwelling-places), but Halsaflieni was an enormous ossuary, of which others may have existed in other parts of the island; for the numerous rock-cut tombs which are everywhere to be seen belong to the Phoenician and Roman periods. In these buildings there is a great preference for apsidal terminations to the internal chambers, and the façades are as a rule slightly curved. The numerous niches, generally containing sacrificial (?) tables,[2] are often approached by window-like openings hewn out of one of the flat slabs by which they are enclosed. The

surface of the stones in the interior is often pitted, as a form of ornamentation. Even the barren islet of Comino, between Malta and Gozo, was inhabited in prehistoric times.

To the Phoenician period, besides the tombs already mentioned, belong some remains of houses and cisterns, and (probably) a few round towers which are scattered about the island, while the important Roman house at Cittavecchia is the finest monument of this period in the islands.

The Carthaginians came to Malta in the 6th century B.C., not as conquerors, but as friends of a sister Phoenician colony (Freeman, *Hist. Sicily*, i. 255): Carthage in her struggle with Rome was at last driven to levy oppressive tribute, whereupon the Maltese gave up the Punic garrison to Titus Sempronius under circumstances described by Livy (xxi. 51). The Romans did not treat the Maltese as conquered enemies, and at once gave them the privileges of a *municipium*; Cicero (*in Verrem*) refers to the Maltese as "Socii." Nothing was to be gained by displacing the Phoenician inhabitants in a country from which any race less thrifty would find life impossible by agriculture. On the strength of a monument bearing his name, it has been surmised that Hannibal was born in Malta, while his father was governor-general of Sicily; he certainly did not die in Malta. There is evidence from Cicero (*in Verrem*) that a very high stage of manufacturing and commercial prosperity, attained in Carthaginian times, continued in Malta under the Romans. The Phoenician temple of Juno, which stood on the site of Fort St Angelo, is also mentioned by Valerius Maximus. An inscription records the restoration of the temple of Proserpine by Cheriston, a freed-man of Augustus and procurator of Malta. Diodorus Siculus (L. V., c. 4) speaks of the importance and ornamentation of Maltese dwellings, and to this day remains of palaces and dwellings of the Roman period indicate a high degree of civilization and wealth. When forced to select a place of exile, Cicero was at first (*ad Att.* III. 4, X. i. 8, 9) attracted to Malta, over

which he had ruled as quaestor 75 B.C. Among his Maltese friends were Aulus Licinius and Diodorus. Lucius Castricius is mentioned as a Roman governor under Augustus. Publius was "chief of the island" when St Paul was shipwrecked (Acts xxvii. 7); and is said to have become the first Christian bishop of Malta. The site where the cathedral at Notabile now stands is reputed to have been the residence of Publius and to have been converted by him into the first Christian place of worship, which was rebuilt in 1090 by Count Roger, the Norman conqueror of Malta. The Maltese catacombs are strikingly similar to those of Rome, and were likewise used as places of burial and of refuge in time of persecution. They contain clear indication of the interment of martyrs. St Paul's Bay was the site of shipwreck of the apostle in A.D. 58; the "topon diathalasson" referred to in Acts is the strait between Malta and the islet of Selmun. The claim that St Paul was shipwrecked at Meleda off the Dalmatian coast, and not at Malta, has been clearly set at rest, on nautical grounds, by Mr Smith of Jordanhill (*Voyage and Shipwreck of St Paul*, London, 1848). According to tradition and to St Chrysostom (Hom. 54) the stay of the apostle resulted in the conversion of the Maltese to Christianity. The description of the islanders in Acts as "barbaroi" confirms the testimony of Diodorus Siculus that they were Phoenicians, neither hellenized nor romanized. The bishopric of Malta is referred to by Rocco Pirro (*Sicilia sacra*), and by Gregory the Great (*Epist.* 2, 44; 9, 63; 10, 1). It appears that Malta was not materially affected by the Greek schism, and remained subject to Rome.

On the final division of the Roman dominions in A.D. 395 Malta was assigned to the empire of Constantinople. On the third Arab invasion, A.D. 870, the Maltese joined forces against the Byzantine garrison, and 3000 Greeks were massacred. Unable to garrison the island with a large force, the Arabs cleared a zone between the central stronghold, Medina, and the suburb called Rabat, to restrict the fortified area. Many Arab coins, some Kufic inscriptions and several burial-places were left by the Arabs; but they

did not establish their religion or leave a permanent impression on the Phoenician inhabitants, or deprive the Maltese language of the characteristics which differentiate it from Arabic. There is no historical evidence that the domination of the Goths and Vandals in the Mediterranean ever extended to Malta; there are fine Gothic arches in two old palaces at Notabile, but these were built after the Norman conquest of Malta. In 1090 Count Roger the Norman (son of Tancred de Hauteville), then master of Sicily, came to Malta with a small retinue; the Arab garrison was unable to offer effective opposition, and the Maltese were willing and able to welcome the Normans as deliverers and to hold the island after the immediate withdrawal of Count Roger. A bishop of Malta was witness to a document in 1090. The Phoenician population had continued Christian during the mild Arab rule. Under the Normans the power of the Roman Church quickly augmented, tithes were granted, and ecclesiastical buildings erected and endowed. The Normans, like the Arabs, were not numerically strong; the rule of both, in Sicily as well as Malta, was based on a recognition of municipal institutions under local officials; the Normans, however, exterminated the Mahommedans. Gradually feudal customs asserted themselves. In 1193 Margarito Brundusio received Malta as a fief with the title of count; he was Grand Admiral of Sicily. Constance, wife of the emperor Henry IV. of Germany became, in 1194, heiress of Sicily and Malta; she was the last of the Norman dynasty. The Grand Admiral of Sicily in 1223 was Henry, count of Malta. He had led 300 Maltese at the capture of two forts in Tripoli by the Genoese. In 1265 Pope Alexander IV. conferred the crown of Sicily on Charles of Anjou to the detriment of Manfred, from whom the French won the kingdom at the battle of Benevento. Under the will of Corradino a representative of the blood of Roger the Norman, Peter of Aragon claimed the succession, and it came to him by the revolution known as “the Sicilian Vespers” when 28,000 French were exterminated in Sicily. Charles held Malta for two years longer, when

the Aragonese fleet met the French off Malta, and finally crushed them in the Grand Harbour. In 1427 the Turks raided Malta and Gozo, they carried many of the inhabitants into captivity, but gained no foothold. The Maltese joined the Spaniards in a disastrous raid against Gerbi on the African coast in 1432. In 1492 the Aragonese expelled the Jews. Dissatisfaction arose under Aragonese rule from the periodical grants of Malta, as a marquisate or countship, to great officers of state or illegitimate descendants of the sovereign. Exemption was obtained from these incidences of feudalism by large payments to the Crown in return for charters covenanting that Malta should for ever be administered under the royal exchequer without the intervention of intermediary feudal lords. This compact was twice broken, and in 1428 the Maltese paid King Alfonso 30,000 florins for a confirmation of privileges, with a proviso that entitled them to resist by force of arms any intermediate lord that his successors might attempt to impose. Under the Aragonese, Malta, as regards local affairs, was administered by a *Università* or municipal commonwealth with wide and indefinite powers, including the election of its officers, Capitan di Verga, Jurats, &c. The minutes of the "Consiglio Popolare" of this period are preserved, showing it had no legislative power; this was vested in the king, and was exercised despotically in the interests of the Crown. The Knights of St John having been driven from Rhodes by the Turks, obtained the grant of Malta, Gozo and Tripoli in 1530 from the emperor Charles V., subject to a reversion in favour of the emperor's successor in the kingdom of Aragon should the knights leave Malta, and to the annual tribute of a falcon in acknowledgment that Malta was under the suzerainty of Spain. The Maltese, at first, challenged the grant as a breach of the charter of King Alfonso, but eventually welcomed the knights. The Grand Master de l'Isle Adam, on entering the ancient capital of Notabile, swore for himself and his successors to maintain the rights and liberties of the Maltese. The Order of St John took up its abode on the promontory guarded by the castle of St

Angelo on the southern shore of the Grand Harbour, and, in expectation of attacks from the Turks, commenced to fortify the neighbouring town called the Borgo. The knights lived apart from the Maltese, and derived their principal revenues from estates of the Order in the richest countries of Europe. They accumulated wealth by war, or by privateering against the Turks and their allies. The African Arabs under Selim Pasha in 1551 ravaged Gozo, after an unsuccessful attempt on Malta, repulsed by cavalry under Upton, an English knight. The Order of St John and the Christian Maltese now realized that an attempt to exterminate them would soon be made by Soliman II., and careful preparations were made to meet the attack.

The great siege of Malta which made the island and its knights famous, and checked the advance of Mahommedan power in southern and western Europe, began in May 1565. The fighting men of the defenders are variously recorded between 6100 and 9121; the roll comprises one English knight, Oliver Starkey. The Mahommedan forces were estimated from 29,000 to 38,500. Jehan Parisot de la Valette had participated in the defence of Rhodes, and in many naval engagements. He had been taken prisoner by Dragut, who made him row for a year as a galley slave till ransomed. This Grand Master had gained the confidence of Philip of Spain, the friendship of the viceroy of Sicily, of the pope and of the Genoese admiral, Doria. The Sultan placed his troops under the veteran Mustapha, and his galleys under his youthful relative Piali, he hesitated to make either supreme and ordered them to await the arrival of Dragut with his Algerian allies, before deciding on their final plans. Meanwhile, against Mustapha's better judgment, Piali induced the council of war to attack St Elmo, in order to open the way for his fleet to an anchorage, safe in all weathers, in Marsamuscetto harbour. This strategical blunder was turned to the best advantage by La Valette, who so prolonged the most heroic defence of St Elmo that the Turks lost 7000 killed and as many wounded before exterminating the 1200 defenders, who fell at their post. In the interval Dragut was mortally wounded, the attack on

Notabile was neglected, valuable time lost, and the main objective (the Borgo) and St Angelo left intact. The subsequent siege of St Angelo, and its supporting fortifications, was marked by the greatest bravery on both sides. The knights and their Maltese troops fought for death or victory, without asking or giving quarter. The Grand Master proved as wise a leader as he was brave. By September food and ammunition were getting scarce, a large relieving force was expected from Sicily, and Piali became restive, on the approach of the equinox, for the safety of his galleys. At last the viceroy of Sicily, who had the Spanish and allied fleets at his disposal, was spurred to action by his council. He timidly landed about 6000 or 8000 troops at the north-west of Malta and withdrew. The Turks began a hurried embarcation and allowed the Christians to join forces at Notabile; then, hearing less alarming particulars of the relieving force, Mustapha relanded his reluctant troops, faced his enemies in the open, and was driven in confusion to his ships on the 8th of September.

The Order thus reached the highest pinnacle of its fame, and new knights flocked to be enrolled therein from the flower of the nobility of Europe; La Valette refused a cardinal's hat, determined not to impair his independence. He made his name immortal by founding on Mt Sceberras "a city built by gentlemen for gentlemen" and making Valletta a magnificent example of fortification, unrivalled in the world. The pope and other sovereigns donated vast sums for this new bulwark of Christianity, but, as its ramparts grew in strength, the knights were slow to seek the enemy in his own waters, and became false to their traditional strategy as a naval power. Nevertheless, they harassed Turkish commerce and made booty in minor engagements throughout the 16th and 18th centuries, and they took part as an allied Christian power in the great victory of Lepanto. With the growth of wealth and security the martial spirit of the Order began to wane, and so also did its friendly relations with the Maltese. The field for recruiting its members, as well as its landed estates, became restricted by the

Reformation in England and Germany, and the French knights gradually gained a preponderance which upset the international equilibrium of the Order. The election of elderly Grand Masters became prevalent, the turmoil and chances of frequent elections being acceptable to younger members. The civil government became neglected and disorganized, licentiousness increased, and riots began to be threatening. Expenditure on costly buildings was almost ceaseless, and kept the people alive. In 1614 the Vignacourt aqueduct was constructed. The Jesuits established a university, but they were expelled and their property confiscated in 1768. British ships of war visited Malta in 1675, and in 1688 a fleet under the duke of Grafton came to Valletta. The fortifications of the "Three Cities" were greatly strengthened under the Grand Master Cotoner.

In 1722 the Turkish prisoners and slaves, then very numerous, formed a conspiracy to rise and seize the island. Premature discovery was followed by prompt suppression. Castle St Angelo and the fort of St James were, in 1775, surprised by rebels, clamouring against bad government; this rising is known as the Rebellion of the Priests, from its leader, Mannarino. The last but one of the Grand Masters who reigned in Malta, de Rohan, restored good government, abated abuses and promulgated a code of laws; but the ascendancy acquired by the Inquisition over the Order, the confiscation of the property of the knights in France on the outbreak of the Revolution, and the intrigues of the French made the task of regenerating the Order evidently hopeless in the changed conditions of Christendom. On the death of Rohan the French knights disagreed as to the selection of his successor, and a minority were able to elect, in 1797, a German of weak character, Ferdinand Hompesch, as the last Grand Master to rule in Malta. Bonaparte had arranged to obtain Malta by treachery, and he took possession without resistance in June 1798; after a stay of six days he proceeded with the bulk of his forces to Egypt, leaving General Vaubois with 6000 troops to hold Valletta. The exiled knights made an attempt to reconstruct themselves

under the emperor Paul of Russia, but finally the Catholic parent stem of the Order settled in Rome and continues there under papal auspices. It still comprises members who take vows of celibacy and prove the requisite number of quarterings.

Towards the close of the rule of the knights in Malta feudal institutions had been shaken to their foundations, but the transition to republican rule was too sudden and extreme for the people to accept it. The French plundered the churches, abolished monks, nuns and nobles, and set up forthwith the ways and doings of the French Revolution. Among other laws Bonaparte enacted that French should at once be the official language, that 30 young men should every year be sent to France for their education; that all foreign monks be expelled, that no new priests be ordained before employment could be found for those existing; that ecclesiastical jurisdiction should cease; that neither the bishop nor the priests could charge fees for sacramental ministrations, &c. Stoppage of trade, absence of work (in a population of which more than half had been living on foreign revenues of the knights), and famine, followed the defeat of Bonaparte at the Nile, and the failure of his plans to make Malta a centre of French trade. An attempt to seize church valuables at Notabile was forcibly resisted by the Maltese, and general discontent broke out into open rebellion on the 2nd of September 1798. The French soon discovered to their dismay that, from behind the rubble walls of every field, the agile Maltese were unassailable. The prospect of an English blockade of Malta encouraged the revolt, of which Canon Caruana became the leader. Nelson was appealed to, and with the aid of Portuguese allies he established a blockade and deputed Captain Ball, R. N. (afterwards the first governor) to assume, on the 9th of February 1799, the provisional administration of Malta and to superintend operations on land. Nelson recognized the movement in Malta as a successful revolution against the French, and upheld the contention that the king of Sicily (as successor to Charles V. in that part of the former kingdom of

Aragon) was the legitimate sovereign of Malta. British troops were landed to assist in the siege; few lives were lost in actual combat, nevertheless famine and sickness killed thousands of the inhabitants, and finally forced the French to surrender to the allies. Canon Caruana and other leaders of the Maltese aspired to obtain for Malta the freedom of the Roman Catholic religion guaranteed by England in Canada and other dependencies, and promoted a petition in order that Malta should come under the strong power of England rather than revert to the kingdom of the two Sicilies.

The Treaty of Amiens (1802) provided for the restoration of the island to the Order of St John; against this the Maltese strongly protested, realizing that it would be followed by the re-establishment of French influence. The English flag was flown side by side with the Neapolitan, and England actually renewed war with France sooner than give up Malta. The Treaty of Paris (1814), with the acclamations of the Maltese, confirmed Great Britain in the aggregation of Malta to the empire.

A period elapsed before the government of Malta again became self-supporting, during which over £600,000 was contributed by the British exchequer in aid of revenue, and for the importation of food-stuffs. The restoration of Church property, the re-establishment of law and administration on lines to which the people were accustomed before the French invasion, and the claiming for the Crown of the vast landed property of the knights, were the first cares of British civil rule. As successor to the Order, the Crown claimed and eventually established (by the negotiations in Rome of Sir Frederick Hankey, Sir Gerald Strickland and Sir Lintorn Simmons) with regard to the presentation of the bishopric (worth about £4000 a year) the right to veto the appointment of distasteful candidates. This right was exercised to secure the nomination of Canon Caruana and later of Monsignor Pace. When the pledge, given by the Treaty of Amiens, to restore the Order of St John with a national Maltese “langue,” could not

be fulfilled, political leaders began demanding instead the re-establishment of the "Consiglio Popolare" of Norman times (without reflecting that it never had legislative power); but by degrees popular aspirations developed in favour of a free constitution on English lines. The British authorities steadily maintained that, at least until the mass of the people became educated, representative institutions would merely screen irresponsible oligarchies. After the Treaty of Paris stability of government developed, and many important reforms were introduced under the strong government of the masterful Sir Thomas Maitland; he acted promptly, without seeking popularity or fearing the reverse, and he ultimately gained more real respect than any other governor, not excepting the marquess of Hastings, who was a brilliant and sympathetic administrator. Trial by jury for criminal cases was established in 1829. A council of government, of which the members were nominated, was constituted by letters patent in 1835, but this measure only increased the agitation for a representative legislature. Freedom of the press and many salutary innovations were brought about on a report of John Austin and G. C. Lewis, royal commissioners, appointed in 1836. The basis of taxation was widened, sinecures abolished, schools opened in the country districts, legal procedure simplified, and Police established on an English footing. Queen Adelaide visited Malta in 1838 and founded the Anglican collegiate church of St Paul. Sir F. Hankey as chief secretary was for many years the principal official of the civil administration. In 1847 Mr R. Moore O'Ferrall was appointed civil governor. In June 1849 the constitution of the council was altered to comprise ten nominated and eight elected members.

The revolutions in Italy caused about this time many, including Crispi and some of the most intellectual Italians, to take refuge in Malta. These foreigners introduced new life into politics and the press, and made it fashionable for educated Maltese to delude themselves with the idea that the Maltese were Italians, because a few of them could speak the language of the peninsula. A clerical reaction followed against new progressive ideas

and English methods of development. After much unreasoning vituperation the Irish Catholic civil governor, who had arrived amidst the acclamations of all, left his post in disgust. His successor as civil governor was Sir W. Reid, who had formerly held military command. His determined attempts to promote education met with intense opposition and little success. At this period the Crimean War brought great wealth and commercial prosperity to Malta. Under Sir G. Le Marchant, in 1858, the nominal rule of military governors was re-established, but the civil administration was largely confided to Sir Victor Houlton as chief secretary, whilst the real power began to be concentrated in the hands of Sir A. Dingli, the Crown advocate, who was the interpreter of the law, and largely its maker, as well as the principal depository of local knowledge, able to prevent the preferment of rivals, and to countenance the barrier which difference of language created between governors and governed. The civil service gravitated into the hands of a clique. At this period much money was spent on the Marsa extension of the Grand Harbour, but the rapid increase in the size of steamships made the scheme inadequate, and limited its value prematurely. The military defences were entirely remodelled under Sir G. Le Marchant, and considerable municipal improvements and embellishments were completed. But this governor was obstructed and misrepresented by local politicians as vehemently as his predecessors and his successors. Ministers at home have often appeared to be inclined to the policy of pleasing by avoiding the reforming of what might be left as it was found. Sir A. Dingli adapted a considerable portion of the Napoleonic Code in a series of Malta Ordinances, but stopped short at points likely to cause agitation. Sir P. Julyan was appointed royal commissioner on the civil establishments, and Sir P. Keenan on education; their work revived the reform movement in 1881. Mr Savona led an agitation for a more sincere system of education on English lines. Fierce opposition ensued, and the *pari passu* compromise was adopted to which reference is made in the section on *Education* above;

Mr Savona was an able organizer, and began the real emancipation of the Maltese masses from educational ignorance; but he succumbed to agitation before accomplishing substantial results.

An executive council was established in 1881, and the franchise was extended in 1883. A quarter of a century of Sir Victor Houlton's policy of *laissez-faire* was changed in 1883 by the appointment of Sir Walter Hely-Hutchinson as chief secretary. An attempt was made to utilize fully the abilities of this eminent administrator by creating him civil lieutenant-governor, in whom to concentrate both the real and the nominal power of detailed administration; but the military authorities objected to his corresponding directly with the Colonial Office; and a political deadlock began to develop. Sir A. Dingli was transferred from an administrative office to that of chief justice. With the continuance of military power over details, the public could not understand where responsibility really rested. The elected members under the leadership of Dr Mizzi clamoured for more power, opposed reforms and protested against the carrying of government measures by the casting vote of a military governor as president of the council. To force a crisis, abstention of elected members from the council was resorted to, together with the election of notoriously unfit candidates. Under these circumstances a constitution of a more severe type was recommended by those responsible for the government of Malta and was about to be adopted, as the only alternative to a deadlock, by the imperial authorities.

A regulation excluding Maltese from the navy (because of their speaking on board a language that their officers did not understand) provoked from Trinity College, Cambridge, the Strickland correspondence in *The Times* on the constitutional rights of the Maltese, and a leading article induced the Colonial Office to try an experiment known as the Strickland-Mizzi Constitution of 1887. This constitution (abolished in 1903) ended a period

of government by presidential casting votes and official ascendancy. For the first time the elected members were placed in a majority; they were given three seats in the executive council; in local questions the government had to make every effort to carry the majority by persuasion. When persuasion failed and imperial interests, or the rights of unrepresented minorities, were involved the power of the Crown to legislate by order in council could be (and was) freely used. This system had the merit of counteracting any abuse of power by the bureaucracy. It brought to bear on officials effective criticism, which made them alert and hard-working. Governor Simmons eventually gave his support to the new constitution, which was received with acclamation. Strickland, who had been elected while an undergraduate on the cry of equality of rights for Maltese and English, and Mizzi, the leader of the anti-English agitation, were, as soon as elected, given seats in the executive council to cooperate with the government; but their aims were irreconcilable. Mizzi wanted to undo the educational forms of Mr Savona, to ensure the predominance of the Italian language and to work the council as a caucus. Strickland desired to replace bureaucratic government by a system more in touch with the independent gentlemen of the country, and to introduce English ideas and precedents. Friction soon arose. Mizzi cared little for a constitution that did not make him complete master of the situation, and resigned his post in the government.

Sir Walter Hely-Hutchinson left Malta in March 1889, and was succeeded by Sir Gerald Strickland (Count Delia Catena), who lost no time in pushing, and carrying with a rapidity that was considered hasty, reforms that had been retarded for years. The majorities behind the government began to dwindle and agitation to grow. Meanwhile the Royal Malta Militia was established as a link between the Maltese and the garrison. The police were reorganized with proper pay, criminal laws were rigorously enforced. A naval officer was placed over the police to diminish difficulties with the naval authorities and sailors. A marine force was raised to stop smuggling;

and the subtraction of coal during coaling operations was stopped by drastic legislation. The civil service was reorganized so as to reward merit and work by promotion. Tenders were strictly enforced in letting government property and contracts; a largely increased revenue was applied on water supply, drainage and other works. Lepers were segregated by law.

The Malta marriage question evoked widespread agitation; Sir A. Dingli had refrained from making any provision in his code as to marrying. The Maltese relied on the Roman Canon Law, the English on the common law of England, Scots or Irish had nothing but the English law to fall back upon. Maltese authorities were ignorant of the disabilities of British Nonconformists at common law, and they had not perceived that persons with a British domicile could not evade their own laws by marrying in Malta, *e.g.* that an English girl up to the age of 21 required the father's or guardian's consent from which a Maltese was legally exempt at 18. Sir G. Strickland preferred legislation to the covering up of difficulties by governors' licences and appeals to incongruous precedents. Sir Lintorn Simmons was appointed envoy to the Holy See, to ascertain how far legislation might be pushed in the direction of civil marriage without justifying clerical agitation and obstruction in the council. He succeeded in coming to an agreement with Rome. Nevertheless Sir A. Dingli and ecclesiastics of all denominations, for conflicting reasons, swelled the opposition against the liberal concessions obtained from Leo XIII. The legal necessity for legislation in accordance with the agreement was, nevertheless, on a special reference, submitted to the privy council, whose decision affirmed the advisability of legislation and the need for validating retrospectively marriages not supported by either Maltese or English common law. Agitation in the imperial parliament stopped government action, but the publicity of the finding of the privy council warned all concerned against the risk of neglecting the common law of the empire whenever they were not prepared to follow the *lex loci contractus*.

Since the British occupation it was disputed whether the military authorities had the right to alienate for the benefit of the imperial exchequer fortress sites no longer required for defence. The reversion of such property was claimed for the local civil government, and the principles governing these rights were ultimately laid down by an order in council, which also determined military rights to restrict buildings within the range of forts. The co-operation of naval and military authorities was obtained for the construction, at imperial expense, of the breakwater designed to save Malta from being abandoned by long and deep draft modern vessels. British-born subjects were given the right to be tried in English. The new system of education (already described) was set up, and many new schools were built with funds provided by order in council against the wishes of the elected majority.

An order in council (1899) making English the language of the courts after fifteen years (by which the Maltese would have obtained the right to be tried in English) was promulgated at a time when the system of taxation was also being revised; henceforth agitation in favour of Italian and against taxation attained proportions unpleasant for those who preferred popularity to reform and progress. The elected members demanded the recall of Sir G. Strickland on his refusing to change his policy. The military governor gave way, as regards making English the language of the courts on a fixed date, but educational reforms and the imposition of new taxes (those in Malta being 27s. 6d. per head, against 93s. in England) were enacted by an order in council notwithstanding the agitation. Mr Mereweather was appointed chief secretary and civil lieutenant-governor in 1902, and Sir Gerald Strickland became governor and commander-in-chief of the Leeward Islands. Governor Sir F. Grenfell was created a peer. Strenuous efforts were made to placate the Italian party in the administration of the educational reforms; but, as these were not repealed, elected members refused supply, and kept away from the council. Persistence in this course led to the repeal

by letters-patent of 1903 of the Strickland-Mizzi Constitution of 1887. In place of occasional orders in council for important matters in urgent cases, bureaucratic government with an official majority was again, with its drawbacks, fully re-established for all local affairs great and small. The representatives of the people were repeatedly re-elected, only to resign again and again as a protest against a restricted constitution.

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Brydone, Teonge, John Dryden jun., W. Tallack, Rev. H. Seddall, Boisgolin, Rev. W. K. Bedford, W. H. Bartlett, St Priest. Msgr. Bres, M. G. Borch, Oliver Drapper, John Davy, G. M. Letard, Taafe, Busuttil, T. MacGill, J. Quintana, have also written on Malta. For natural science see the works of Dr A. L. Adams, Professor E. Forbes, Captain Spratt, Dr G. Gulia, C. A. Wright and Wood's *Tourist Flora*.

For the language question, see Mr Chamberlain's speech in the House of Commons, on the 28th of January 1902. Also parliamentary papers for Grievances of the Maltese Nobility, and Constitutional Changes.

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1 See T. Zammit, *The Halsaflieni prehistoric hypogeum at Casal Paula, Malta* (Malta, 1910).

2 Sometimes the pillar which represents the *baetylus*, which seems to have been the object of worship, (see A. J. Evans in *Journal of Hellenic Studies*, xxi., 1901) stands free sometimes it serves as support to the table stone which covers the niche, and sometimes again monolithic tables occur. Conical stones (possibly themselves *baetyli*) are also found.

MALTA (or MEDITERRANEAN) FEVER, a disease long prevalent of Malta and formerly at Gibraltar, as well as other Mediterranean centres, characterized by prolonged high temperature, with anaemia, pain and swelling in the joints, and neuritis, lasting on an average four months but extending even to two or three years. Its pathology was long obscure, but owing to conclusive research on the part of Colonel (afterwards Sir) David Bruce, to which contributions were made by various officers of the R.A.M.C. and others, this problem had now been solved. A specific micro-organism, the *Micrococcus melitensis*, was discovered in 1887, and it was traced to the milk of the Maltese goats. A commission was sent out to Malta in 1904 to investigate the question, and after three years' work its conclusions were embodied in a report by Colonel Bruce in 1907. It was shown that the disappearance of the disease from Gibraltar had

synchronized with the non-importation of goats from Malta; and preventive measures adopted in Malta in 1906, by banishing goats' milk from the military and naval dietary, put a stop to the occurrence of cases. In the treatment of Malta fever a vaccine has been used with considerable success.

MALTE-BRUN, CONRAD (1755-1826), French geographer, was born on the 12th of August 1755 at Thisted in Denmark, and died at Paris on the 14th of December 1826. His original name was Malte Conrad Bruun. While a student at Copenhagen he made himself famous partly by his verses, but more by the violence of his political pamphleteering; and at length, in 1800, the legal actions which the government authorities had from time to time instituted against him culminated in a sentence of banishment. The principles which he had advocated were those of the French Revolution, and after first seeking asylum in Sweden he found his way to Paris. There he looked forward to a political career; but, when Napoleon's personal ambition began to unfold itself, Malte-Brun was bold enough to protest, and to turn elsewhere for employment and advancement. He was associated with Edme Mentelle (1730-1815) in the compilation of the *Géographie mathématique ... de toutes les parties du monde* (Paris, 1803-1807, 16 vols.), and he became recognized as one of the best geographers of France. He is remembered, not only as the author of six volumes of the learned *Précis de la géographie universelle* (Paris, 1810-1829), continued by other hands after his death, but also as the originator of the *Annales des voyages* (1808), and one of the founders of the

Geographical Society of Paris. His second son, VICTOR ADOLPHE MALTE-BRUN (1816-1889), followed his father's career of geographer, and was a voluminous author.

MALTHUS, THOMAS ROBERT (1766-1834), English economist, was born in 1766 at the Rookery, near Guildford, Surrey, a small estate owned by his father, Daniel Malthus, a gentleman of good family and independent fortune, of considerable culture, the friend and correspondent of Rousseau and one of his executors. Young Malthus was never sent to a public school, but received his education from private tutors. In 1784 he was sent to Cambridge, where he was ninth wrangler, and became fellow of his college (Jesus) in 1797. The same year he received orders, and undertook the charge of a small parish in Surrey. In the following year he published the first edition of his great work, *An Essay on the Principle of Population as it affects the Future Improvement of Society, with Remarks on the Speculations of Mr Godwin, M. Condorcet, and other Writers*. The work excited a good deal of surprise as well as attention; and with characteristic thoroughness and love of truth the author went abroad to collect materials for the verification and more exhaustive treatment of his views. As Britain was then at war with France, only the northern countries of Europe were quite open to his research at that time; but during the brief Peace of Amiens Malthus continued his investigations in France and Switzerland. The result of these labours appeared in the greatly enlarged and more mature edition of his work published in 1803. In 1805 Malthus married happily, and not long

after was appointed professor of modern history and political economy in the East India Company's College at Haileybury. This post he retained till his death suddenly from heart disease on the 23rd of December 1834. Malthus was one of the most amiable, candid and cultured of men. In all his private relations he was not only without reproach, but distinguished for the beauty of his character. He bore popular abuse and misrepresentation without the slightest murmur or sourness of temper. The aim of his inquiries was to promote the happiness of mankind, which could be better accomplished by pointing out the real possibilities of progress than by indulging in vague dreams of perfectibility apart from the actual facts which condition human life.

Malthus's *Essay on Population* grew out of some discussions which he had with his father respecting the perfectibility of society. His father shared the theories on that subject of Condorcet and Godwin; and his son combated them on the ground that the realization of a happy society will always be hindered by the miseries consequent on the tendency of population to increase faster than the means of subsistence. His father was struck by the weight and originality of his views, asked him to put them in writing, and then recommended the publication of the manuscript. It was in this way the *Essay* saw the light. Thus it will be seen that both historically and philosophically the doctrine of Malthus was a corrective reaction against the superficial optimism diffused by the school of Rousseau. It was the same optimism, with its easy methods of regenerating society and its fatal blindness to the real conditions that circumscribe human life, that was responsible for the wild theories of the French Revolution and many of its consequent excesses.

The project of a formal and detailed treatise on population was an afterthought of Malthus. The essay in which he had studied a hypothetic future led him to examine the effects of the principle he had put forward on

the past and present state of society; and he undertook an historical examination of these effects, and sought to draw such inferences in relation to the actual state of things as experience seemed to warrant. In its original form he had spoken of no checks to population but those which came under the head either of vice or of misery. In the 1803 edition he introduced the new element of the preventive check supplied by what he calls “moral restraint,” and is thus enabled to “soften some of the harshest conclusions” at which he had before arrived. The treatise passed through six editions in his lifetime, and in all of them he introduced various additions and corrections. That of 1816 is the last he revised, and supplies the final text from which it has since been reprinted.

Notwithstanding the great development which he gave to his work and the almost unprecedented amount of discussion to which it gave rise, it remains a matter of some difficulty to discover what solid contribution he has made to our knowledge, nor is it easy to ascertain precisely what practical precepts, not already familiar, he founded on his theoretic principles. This twofold vagueness is well brought out in his celebrated correspondence with Nassau Senior, in the course of which it seems to be made apparent that his doctrine is new not so much in its essence as in the phraseology in which it is couched. He himself tells us that when, after the publication of the original essay, the main argument of which he had deduced from David Hume, Robert Wallace, Adam Smith and Richard Price, he began to inquire more closely into the subject, he found that “much more had been done” upon it “than he had been aware of.” It had “been treated in such a manner by some of the French economists, occasionally by Montesquieu, and, among English writers, by Dr Franklin, Sir James Steuart, Arthur Young and Rev. J. Townsend, as to create a natural surprise that it had not excited more of the public attention.” “Much, however,” he thought, “remained yet to be done. The comparison between the increase of population and food had not, perhaps, been stated with

sufficient force and precision," and "few inquiries had been made into the various modes by which the level" between population and the means of subsistence "is effected." The first desideratum here mentioned—the want, namely, of an accurate statement of the relation between the increase of population and food—Malthus doubtless supposed to have been supplied by the celebrated proposition that "population increases in a geometrical, food in an arithmetical ratio." This proposition, however, has been conclusively shown to be erroneous, there being no such difference of law between the increase of man and that of the organic beings which form his food. When the formula cited is not used, other somewhat nebulous expressions are sometimes employed, as, for example, that "population has a tendency to increase faster than food," a sentence in which both are treated as if they were spontaneous growths, and which, on account of the ambiguity of the word "tendency," is admittedly consistent with the fact asserted by Senior, that food tends to increase faster than population. It must always have been perfectly well known that population will probably (though not necessarily) increase with every augmentation of the supply of subsistence, and may, in some instances, inconveniently press upon, or even for a certain time exceed, the number properly corresponding to that supply. Nor could it ever have been doubted that war, disease, poverty—the last two often the consequences of vice—are causes which keep population down. In fact, the way in which abundance, increase of numbers, want, increase of deaths, succeed each other in the natural economy, when reason does not intervene, had been fully explained by Joseph Townsend in his *Dissertation on the Poor Laws* (1786) which was known to Malthus. Again, it is surely plain enough that the apprehension by individuals of the evils of poverty, or a sense of duty to their possible offspring, may retard the increase of population, and has in all civilized communities operated to a certain extent in that way. It is only when such obvious truths are clothed in the technical terminology of "positive" and "preventive checks" that they appear novel

and profound; and yet they appear to contain the whole message of Malthus to mankind. The laborious apparatus of historical and statistical facts respecting the several countries of the globe, adduced in the altered form of the essay, though it contains a good deal that is curious and interesting, establishes no general result which was not previously well known.

It would seem, then, that what has been ambitiously called Malthus's theory of population, instead of being a great discovery as some have represented it, or a poisonous novelty, as others have considered it, is no more than a formal enunciation of obvious, though sometimes neglected, facts. The pretentious language often applied to it by economists is objectionable, as being apt to make us forget that the whole subject with which it deals is as yet very imperfectly understood—the causes which modify the force of the sexual instinct, and those which lead to variations in fecundity, still awaiting a complete investigation.

It is the law of diminishing returns from land, involving as it does—though only hypothetically—the prospect of a continuously increasing difficulty in obtaining the necessary sustenance for all the members of a society, that gives the principal importance to population as an economic factor. It is, in fact, the confluence of the Malthusian ideas with the theories of Ricardo, especially with the corollaries which the latter deduced from the doctrine of rent (though these were not accepted by Malthus), that has led to the introduction of population as an element in the discussion of so many economic questions in modern times.

Malthus had undoubtedly the great merit of having called public attention in a striking and impressive way to a subject which had neither theoretically nor practically been sufficiently considered. But he and his followers appear to have greatly exaggerated both the magnitude and the urgency of the dangers to which they pointed.[1] In their conceptions a single social imperfection assumed such portentous dimensions that it seemed to

overcloud the whole heaven and threaten the world with ruin. This doubtless arose from his having at first omitted altogether from his view of the question the great counteracting agency of moral restraint. Because a force exists, capable, if unchecked, of producing certain results, it does not follow that those results are imminent or even possible in the sphere of experience. A body thrown from the hand would, under the single impulse of projection, move for ever in a straight line; but it would not be reasonable to take special action for the prevention of this result, ignoring the fact that it will be sufficiently counteracted by the other forces which will come into play. And such other forces exist in the case we are considering. If the inherent energy of the principle of population (supposed everywhere the same) is measured by the rate at which numbers increase under the most favourable circumstances, surely the force of less favourable circumstances, acting through prudential or altruistic motives, is measured by the great difference between this maximum rate and those which are observed to prevail in most European countries. Under a rational system of institutions, the adaptation of numbers to the means available for their support is effected by the felt or anticipated pressure of circumstances and the fear of social degradation, within a tolerable degree of approximation to what is desirable. To bring the result nearer to the just standard, a higher measure of popular enlightenment and more serious habits of moral reflection ought indeed to be encouraged. But it is the duty of the individual to his possible offspring, and not any vague notions as to the pressure of the national population on subsistence, that will be adequate to influence conduct.

It can scarcely be doubted that the favour which was at once accorded to the views of Malthus in certain circles was due in part to an impression, very welcome to the higher ranks of society, that they tended to relieve the rich and powerful of responsibility for the condition of the working classes, by showing that the latter had chiefly themselves to blame, and not either

the negligence of their superiors or the institutions of the country. The application of his doctrines, too, made by some of his successors had the effect of discouraging all active effort for social improvement. Thus Chalmers "reviews *seriatim* and gravely sets aside all the schemes usually proposed for the amelioration of the economic condition of the people" on the ground that an increase of comfort will lead to an increase of numbers, and so the last state of things will be worse than the first.

Malthus has in more modern times derived a certain degree of reflected lustre from the rise and wide acceptance of the Darwinian hypothesis. Its author himself, in tracing its filiation, points to the phrase "struggle for existence" used by Malthus in relation to the social competition. Darwin believed that man advanced to his present high condition through such a struggle, consequent on his rapid multiplication. He regarded, it is true, the agency of this cause for the improvement of the race as largely superseded by moral influences in the more advanced social stages. Yet he considered it, even in these stages, of so much importance towards that end that, notwithstanding the individual suffering arising from the struggle for life, he deprecated any great reduction in the natural, by which he seems to mean the ordinary, rate of increase.

Besides his great work, Malthus wrote *Observations on the Effect of the Corn Laws*; *An Inquiry into the Nature and Progress of Rent*; *Principles of Political Economy*; and *Definitions in Political Economy*. His views on rent were of real importance.

For his life see *Memoir* by his friend Dr Otter, bishop of Chichester (prefixed to 2nd ed., 1836, of the *Principles of Political Economy*), and *Malthus and his Work*, by J. Bonar (London, 1885). Practically every treatise on economics deals with Malthus and his essay, but the following special works may be referred to: Soetbeer, *Die Stellung der Sozialisten zur Malthusschen Bevölkerungslehre* (Berlin, 1886); G. de

Molinari, *Malthus, essai sur le principe de population* (Paris, 1889); Cossa, *Il Principio di popolazione di T. R. Malthus* (Milan, 1895); and Ricardo, *Letters to Malthus*, ed. J. Bonar (1887).

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1 Malthus himself said, "It is probable that, having found the bow bent too much one way, I was induced to bend it too much the other in order to make it straight."

MALTON, a market town in the Thirsk and Malton parliamentary division of Yorkshire, England, 21 m. N.E. of York by a branch of the North Eastern railway. The town comprises Old Malton and New Malton in the North Riding, and Norton on the opposite side of the river Derwent, in the East Riding. Pop. of urban district of Malton (1901), 4758; of urban district of Norton 3842. The situation, on the wooded hills rising from the narrow valley, is very picturesque. The church of St Michael is a fine late Norman building with perpendicular tower; the church of St Leonard, of mixed architecture, with square tower and spire, has three Norman arches and a Norman font. The church of St Mary at Old Malton was attached to a Gilbertine priory founded in 1150; it is transitional Norman and Early English, with later insertions. Remains of the priory are scanty, but include a crypt under a modern house. In the neighbourhood of Malton are the slight but beautiful fragments of Kirkham Abbey, an Early English Augustinian foundation of Walter l'Espec (1131); and the fine mansion of Castle Howard, a massive building by Vanbrugh, the seat of the earls of Carlisle, containing a noteworthy collection of pictures. Malton possesses a

town-hall, a corn exchange, a museum, and a grammar-school founded in 1547. There are iron and brass foundries, agricultural implement works, corn mills, tanneries and breweries. In the neighbourhood are lime and whinstone quarries.

Traces of a Romano-British village exist on the east side of the town, but there appears to be no history of Malton before the Norman Conquest. The greater part of Malton belonged to the crown in 1086 and was evidently retained until Henry I. gave the castle and its appurtenances to Eustace son of John, whose descendants took the name of Vescy. Eustace meditated the deliverance of Malton Castle to King David of Scotland in 1138, but his plans were altered owing to the battle of the Standard. The “burgh” of Malton is mentioned in 1187, and in 1295 the town returned two members to parliament. It was not represented again, however, until 1640, when an act was passed to restore its ancient privileges. In 1867 the number of members was reduced to one, and in 1885 the town was disfranchised. Until the 17th century the burgesses had all the privileges of a borough by prescriptive right, and were governed by two bailiffs and two under-bailiffs, but these liberties were taken from them in 1684 and have never been revived. From that time a bailiff and two constables were appointed at the court leet of the lord of the manor until a local board was formed in 1854. In the 13th century Agnes de Vescy, then lady of the manor, held a market in Malton by prescription, and Camden writing about 1586 says that the lord of the manor then held two weekly markets, on Tuesday and Saturday, the last being the best cattle market in the county. The markets are now held on Saturdays and alternate Tuesdays, and still belong to the lord of the manor.

MALTZAN, HEINRICH VON, Baron zu Wartenburg und Penzlin (1826-1874), German traveller, was born on the 6th of September 1826 near Dresden. He studied law at Heidelberg, but on account of ill health spent much of his time from 1850 in travel. Succeeding to his father's property in 1852, he extended the range of his journeys to Morocco and other parts of Barbary, and before his return home in 1854 had also visited Egypt, Palestine and other countries of the Levant. In 1856-1857 he was again in Algeria; in 1858 he reached the city of Morocco; and in 1860 he succeeded in performing the pilgrimage to Mecca, which he afterwards described in *Meine Wallfahrt nach Mecca* (Leipzig, 1865), but had to flee for his life to Jidda without visiting Medina. He then visited Aden and Bombay, and after some two years of study in Europe again began to wander through the coasts and islands of the Mediterranean, repeatedly visiting Algeria. His first book of travel, *Drei Jahre im Nordwesten von Afrika* (Leipzig), appeared in 1863, and was followed by a variety of works and essays, popular and scientific. Maltzan's last book, *Reise nach Südarabien* (Brunswick, 1873), is chiefly valuable as a digest of much information about little-known parts of south Arabia collected from natives during a residence at Aden in 1870-1871. Among his other services to science must be noticed his collection of Punic inscriptions (*Reise in Tunis und Tripolis*, Leipzig, 1870), and the editing of Adolph von Wrede's remarkable journey in Hadramut (*Reise in Hadramaut*, &c., Brunswick,

1870). After long suffering from neuralgia, Maltzan died by his own hand at Pisa on the 23rd of February 1874.

MALUS, ÉTIENNE LOUIS (1775-1812), French physicist, was born at Paris on the 23rd of June 1775. He entered the military engineering school at Mezières; but, being regarded as a suspected person, he was dismissed without receiving a commission, and obliged to enter the army as a private soldier. Being employed upon the fortifications of Dunkirk, he attracted the notice of the director of the works, and was selected as a member of the École polytechnique then to be established under G. Monge. After three years at the École he was admitted into the corps of engineers, and served in the army of the Sambre and Meuse; he was present at the passage of the Rhine in 1797, and at the affairs of Ukratz and Altenkirch. In 1798 he joined the Egyptian expedition and remained in the East till 1801. On his return he held official posts successively at Antwerp, Strassburg and Paris, and devoted himself to optical research. A paper published in 1809 ("Sur une propriété de la lumière réfléchie par les corps diaphanes") contained the discovery of the polarization of light by reflection, which is specially associated with his name, and in the following year he won a prize from the Institute with his memoir, "Théorie de la double refraction de la lumière dans les substances cristallines." He died of phthisis in Paris on the 23rd of February 1812.

MALVACEAE, in botany, an order of Dicotyledons belonging to the series Columniferae, to which belong also the orders Tiliaceae (containing *Tilia*, the lime-tree), Bombaceae (containing *Adansonia*, the baobab), Sterculiaceae (containing *Theobroma*, cocoa, and *Colo*, cola-nut). It contains 39 genera with about 300 species, and occurs in all regions except the coldest, the number of species increasing as we approach the tropics. It is represented in Britain by three genera: *Malva*, mallow; *Althaea*, marsh-mallow; and *Lavatera*, tree-mallow. The plants are herbs, as in the British mallows, or, in the warmer parts of the earth, shrubs or trees. The leaves are alternate and often palmately lobed or divided; the stipules generally fall early. The leaves and young shoots often bear stellate hairs and the tissues contain mucilage-sacs. The regular, hermaphrodite, often showy flowers are borne in the leaf-axils, solitary or in fasicles, or form more or less complicated cymose

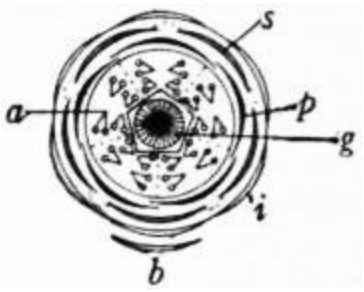


FIG. 1.—Floral Diagram of Hollyhock (*Althaea rosea*).

a, Stamens. *b*, Bract.
g, Pistil of carpels.
i, Epicalyx, formed from an involucre of bracteoles.
p, Petals. *s*, Sepals.

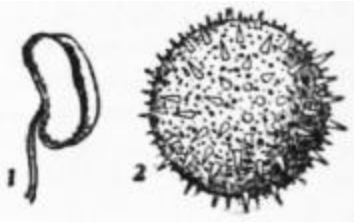


FIG. 2.

1, Anther.
2, Pollen grain of Hollyhock (*Althaea rosea*) enlarged. The pollen grain bears numerous spines, the

dark spots indicate thin places in the extine.

arrangements. An epicalyx (see MALLOW, figs. 3, 4), formed by a whorl of three or more bracteoles is generally present just beneath the calyx; sometimes, as in *Abutilon*, it is absent. The parts of the flowers are typically in fives (fig. 1); the five sepals, which have a valvate aestivation, are succeeded by five often large showy petals which are twisted in the bud; they are free to the base, where they are attached to the staminal tube and fall with it when the flower withers. The very numerous stamens are regarded as arising from the branching of a whorl of five opposite the petals; they are united into a tube at the base, and bear kidney-shaped one-celled anthers which open by a slit across the top (fig. 2). The large spherical pollen-grains are covered with spines. The carpels are one to numerous; when five in number, as in *Abutilon*, they are opposite the petals, or, as in *Hibiscus*, opposite the sepals. In the British genera and many others they are numerous, forming a whorl round the top of the axis in the centre of the flower, the united styles rising from the centre and bearing a corresponding number of stigmatic branches. In *Malope* the numerous carpels are arranged one above the other in vertical rows. One or more anatropous ovules are attached to the inner angle of each carpel; they are generally ascending but sometimes pendulous or horizontal; the position may vary, as in *Abutilon*, in one and the same carpel.

The flowers are proterandrous; when the flower opens the unripe stigmas are hidden in the staminal tube and the anthers occupy the centre of the flower; as the anthers dehisce the filaments bend backwards and finally the ripe stigmas spread in the centre. Pollination is effected by insects which visit the flower for the honey, which is secreted in pits one between the base of each petal and is protected from rain by hairs on the lower margin of the petals. In small pale-flowered forms, like *Malva rotundifolia*, which attract few insects, self-pollination has been observed, the style-arms twisting to bring the stigmatic surfaces into contact with the anthers.

Except in *Malvaviscus* which has a berry, the fruits are dry. In *Malva* (see MALLOW) and allied genera they form one-seeded schizocarps separating from the persistent central column and from each other. In *Hibiscus* and *Gossypium* (cotton-plant, *q.v.*), the fruit is a capsule splitting loculicidally. Distribution of the seeds is sometimes aided by hooked outgrowths on the wall of the schizocarp, or by a hairy covering on the seed, an extreme case of which is the cotton-plant where the seed is buried in a mass of long tangled hairs—the cotton. The embryo is generally large with much-folded cotyledons and a small amount of endosperm.

The largest genus, *Hibiscus*, contains 150 species, which are widely distributed chiefly in the tropics; *H. rosasinensis* is a well-known greenhouse plant. *Abutilon* (*q.v.*) contains 80 species, mainly tropical; *Lavatera*, with 20 species, is chiefly Mediterranean; *Althaea* has about 15 species in temperate and warm regions, *A. rosea* being the hollyhock (*q.v.*); *Malva* has about 30 species in the north-temperate zone. Several genera are largely or exclusively American.

MALVASIA (Gr. *Monemvasia*, *i.e.* the "city of the single approach or entrance"; Ital. *Napoli di Malvasia*; Turk. *Mengeshe* or *Beneshe*), one of the principal fortresses and commercial centres of the Levant during the middle ages, still represented by a considerable mass of ruins and a town of about 550 inhabitants. It stood on the east coast of the Morea, contiguous to the site of the ancient Epidaurus Limera, of which it took the place. So

extensive was its trade in wine that the name of the place became familiar throughout Europe as the distinctive appellation of a special kind—Ital. *Malvasia*; Span. *Malvagia*; Fr. *Malvoisie*; Eng. *Malvesie* or *Malmsey*. The wine was not of local growth, but came for the most part from Tenos and others of the Cyclades.

As a fortress Malvasia played an important part in the struggles between Byzantium, Venice and Turkey. The Byzantine emperors considered it one of their most valuable posts in the Morea, and rewarded its inhabitants for their fidelity by unusual privileges. Phrantzes (Lib. IV. cap. xvi.) tells how the emperor Maurice made the city (previously dependent in ecclesiastical matters on Corinth) a metropolis or archbishop's see, and how Alexius Comnenus, and more especially Andronicus II. (Palaeologus) gave the Monembasiotes freedom from all sorts of exactions throughout the empire. It was captured after a three years' siege by Guillaume de Villehardouin in 1248, but the citizens retained their liberties and privileges, and the town was restored to the Byzantine emperors in 1262. After many changes, it placed itself under Venice from 1463 to 1540, when it was ceded to the Turks. In 1689 it was the only town of the Morea which held out against Morosini, and Cornaro his successor only succeeded in reducing it by famine. In 1715 it capitulated to the Turks, and on the failure of the insurrection of 1770 the leading families were scattered abroad. As the first fortress which fell into the hands of the Greeks in 1821, it became in the following year the seat of the first national assembly.

See Curtius, *Peloponnesos*, ii. 293 and 328; Castellan, *Lettres sur la Morée* (1808), for a plan; Valiero, *Hist. della guerra di Candia* (Venice, 1679), for details as to the fortress; W. Miller in *Journal of Hellenic Studies* (1907).

MALVERN, an inland watering-place in the Bewdley parliamentary division of Worcestershire, England, 128 m. W.N.W. from London by the Great Western railway, served also by a branch of the Midland railway from Ashchurch on the Bristol-Birmingham line. Pop. of urban district(1901), 16,449. It is beautifully situated on the eastern slopes of the Malvern Hills, which rise abruptly from the flat valley of the Severn to a height of 1395 ft. in the Worcestershire Beacon. The district still bears the name of Malvern Chase, originally a Crown-land and forest, though it was granted to the earldom of Gloucester by Edward I. A ditch along the summit of the hills determined the ancient boundary. Becoming a notorious haunt of criminals, the tract was disafforested by Charles I., with the exception of a portion known as the King's Chase, part of which is included in the present common-land formed under the Malvern Hills Act of 1884.

Malvern was in early times an important ecclesiastical settlement, but its modern fame rests on its fine situation, pure air, and chalybeate and bituminous springs. The open-air cure for consumptive patients is here extensively practised.

The name Malvern is collectively applied to a line of small towns and villages, extending along the foot of the hills for 5 m. The principal is GREAT MALVERN, lying beneath the Worcestershire Beacon. It has a joint station of the Great Western and Midland railways. Here was the Benedictine priory which arose in 1083 out of a hermitage endowed by

Edward the Confessor. The priory church of SS. Mary and Michael is a fine cruciform Perpendicular building, with an ornate central tower, embodying the original Norman nave, and containing much early glass and carved choir-stalls. The abbey gate and the refectory also remain. There are here several hydropathic establishments, and beautiful pleasure gardens. Malvern College, founded in 1862, is an important English public school. A museum is attached to it. Mineral waters are manufactured. At MALVERN WELLS, 2½ m. S., are the principal medicinal springs, also the celebrated Holy Well, the water of which is of perfect purity. There are extensive fishponds and hatcheries; and golf-links. The Great Western railway has a station, and the Midland one at Hanley Road. LITTLE MALVERN lies at the foot of the Herefordshire Beacon, which is crowned by a British camp, 1½ m. S. of Malvern Wells. There was a Benedictine priory here, of which traces remain in the church. MALVERN LINK, 1 m. N.E. of Great Malvern, of which it forms a suburb, has a station on the Great Western railway. WEST MALVERN and NORTH MALVERN, named from their position relative to Great Malvern, are pleasant residential quarters on the higher slopes of the hills.

MALWA, an historic province of India, which has given its name to one of the political agencies into which Central India is divided. Strictly, the name is confined to the hilly table-land, bounded S. by the Vindhyan range, which drains N. into the river Chambal; but it has been extended to include the Nerbudda valley farther south. Its derivation is from the ancient tribe of Malavas about whom very little is known, except that they founded the

Vikrama Samvat, an era dating from 57 B.C., which is popularly associated with a mythical king Vikramaditya. The earliest name of the tract seems to have been Avanti, from its capital the modern Ujjain. The position of the Malwa or Moholo mentioned by Hsuan Tsang (7th century) is plausibly assigned to Gujarat. The first records of a local dynasty are those of the Paramaras, a famous Rajput clan, who ruled for about four centuries (800-1200), with their capital at Ujjain and afterwards at Dhar. The Mahommedans invaded Malwa in 1235; and in 1401 Dilawar Khan Ghori founded an independent kingdom, which lasted till 1531. The greatest ruler of this dynasty was Hoshang Shah (1405-1435), who made Mandu (*q.v.*) his capital and embellished it with magnificent buildings. In 1562 Malwa was annexed to the Mogul empire by Akbar. On the break-up of that empire, Malwa was one of the first provinces to be conquered by the Mahrattas. About 1743 the Mahratta peshwa obtained from Delhi the title of governor, and deputed his authority to three of his generals—Sindhia of Gwalior, Holkar of Indore, and the Ponwar of Dhar who claims descent from the ancient Paramaras. At the end of the 18th century Malwa became a cockpit for fighting between the rival Mahratta powers, and the headquarters of the Pindaris or irregular plunderers. The Pindaris were extirpated by the campaign of Lord Hastings in 1817, and the country was reduced to order by the energetic rule of Sir John Malcolm. Malwa is traditionally the land of plenty, in which sufferers from famine in the neighbouring tracts always take refuge. But in 1899-1900 it was itself visited by a severe drought, which seriously diminished the population, and has since been followed by plague. The most valuable product is opium.

The Malwa agency has an area of 8919 sq. m. with a population (1901) of 1,054,753. It comprises the states of Dewas (senior and junior branch), Jaora, Ratlam, Sitamau and Sailana, together with a large portion of Gwalior, parts of Indore and Tonk, and about 35 petty estates and holdings. The headquarters of the political agent are at Nimach.

Malwa is also the name of a large tract in the Punjab, south of the river Sutlej, which is one of the two chief homes of the Sikhs, the other being known as Manjha. It includes the British districts of Ferozpore and Ludhiana, together with the native states of Patiala, Jind, Nabha and Maler Kotla.

See J. Malcolm, *Central India* (1823); C. E. Luard, *Bibliography of Central India* (1908), and *The Paramars of Dhar and Malwa* (1908).

MAMARONECK, a township of Westchester county, New York, U.S.A., on Long Island Sound, about 20 m. N.E. of New York City and a short distance N.E. of New Rochelle. Pop. (1890), 2385; (1900) 3849; (1905) 5655; (1910) 5602. Mamaroneck is served by the New York, New Haven & Hartford railway. The township includes the village of Larchmont (pop. in 1910, 1958), incorporated in 1891, and part of the village of Mamaroneck (pop. in 1910, including the part in Rye township, 5699), incorporated in 1895. Larchmont is the headquarters of the Larchmont Yacht Club. The site of Mamaroneck township was bought in 1660 from the Indians by John Richbell, an Englishman, who obtained an English patent to the tract in 1668. The first settlement was made by relatives of his on the site of Mamaroneck village in 1676, and the township was erected in 1788. On the 28th of August 1776, near Mamaroneck, a force of American militiamen under Capt. John Flood attacked a body of Loyalist recruits under William Lounsbury, killing the latter and taking several prisoners.

Soon afterwards Mamaroneck was occupied by the Queen's Rangers under Colonel Robert Rogers. On the night of the 21st of October an attempt of a force of Americans under Colonel John Haslet to surprise the Rangers failed, and the Americans, after a hand-to-hand fight, withdrew with 36 prisoners. Mamaroneck was the home of John Peter DeLancey (1753-1828), a Loyalist soldier in the War of Independence, and was the birthplace of his son William Heathcote DeLancey (1797-1865), a well-known Protestant Episcopal clergyman, provost of the University of Pennsylvania in 1827-1832 and bishop of western New York from 1839 until his death. James Fenimore Cooper, the novelist, married (1811) a daughter of John Peter DeLancey; lived in Mamaroneck for several years, and here wrote his first novel, *Precaution*, and planned *The Spy*.

MAMELI, GOFFREDO (1827-1849), Italian poet and patriot, was born at Genoa of a noble Sardinian family. He received a sound classical education at the Scolopi College, and later studied law and philosophy at the university of Genoa. When nineteen years old he corresponded with Mazzini, to whom he became whole-heartedly devoted; among other patriotic poems he wrote a hymn to the Bandiera brothers, and in the autumn of 1847 a song called "Fratelli d'Italia," which as Carducci wrote, "resounded through every district and on every battlefield of the peninsula in 1848 and 1849." Mameli served in the National Guard at Genoa, and then joined the volunteers in the Lombard campaign of 1848, but after the collapse of the movement in Lombardy he went to Rome,

where the republic was proclaimed and whence he sent the famous despatch to Mazzini: “Roma! Repubblica! Venite!” At first he wrote political articles in the newspapers, but when the French army approached the city with hostile intentions he joined the fighting ranks and soon won Garibaldi’s esteem by his bravery. Although wounded in the engagement of the 30th of April, he at once resumed his place in the ranks, but on the 3rd of June he was again wounded much more severely, and died in the Pellegrini hospital on the 6th of July 1849. Besides the poems mentioned above, he wrote hymns to Dante, to the Apostles, “Dio e popolo,” &c. The chief merit of his work lies in the spontaneity and enthusiasm for the Italian cause which rendered it famous, in spite of certain technical imperfections, and he well deserved the epithet of “The Tyrtaeus of the Italian revolution.”

See A. G. Barrili, “G. Mameli nella vita e nell’ arte,” in *Nuova Antologia* (June 1, 1902); the same writer’s edition of the *Scritti editi ed inediti di G. Mameli* (Genoa, 1902); Countess Martinengo Cesaresco, *Italian Characters* (London, 1901); A. Luzio, *Profili Biografici* (Milan, 1906); G. Trevelyan, *Garibaldi’s Defence of the Roman Republic* (London, 1907).

MAMELUKE (anglicized through the French, from the Arabic *mamlūk*, a slave), the name given to a series of Egyptian sultans, originating (1250) in the usurpation of supreme power by the bodyguard of Turkish

slaves first formed in Egypt under the successors of Saladin. See EGYPT: *History* (Moslem period).

MAMERTINI, or "children of Mars," the name taken by a band of Campanian (or Samnite) freebooters who about 289 B.C. seized the Greek colony of Messana at the north-east corner of Sicily, after having been hired by Agathocles to defend it (Polyb. 1. 7. 2). The adventure is explained by tradition (*e.g.* Festus 158, Müller) as the outcome of a *ver sacrum*; the members of the expedition are said to have been the male children born in a particular spring of which the produce had been vowed to Apollo (cf. SAMNITES), and to have settled first in Sicily near Tauromenium. An inscription survives (R. S. Conway, *Italic Dialects*, 1) which shows that they took with them the Oscan language as it was spoken in Capua or Nola at that date, and the constitution usual in Italic towns of a free community (*touta* =) governed by two annual magistrates (*meddices*). The inscription dedicated some large building (possibly a fortification) to Apollo, which so far confirms the tradition just noticed. Though in the Oscan language, the inscription is written in the Greek alphabet common to south Italy from the 4th century B.C. onwards, viz. the Tarentine Ionic, and so are the legends of two coins of much the same date as the inscription (Conway, ib. 4). From 282 onwards (B. V. Head, *Historia numorum*, 136) the legend itself is Graecized (MAMEPTINΩN instead of MAAMEPTINOϒM) which shows how quickly here, as everywhere, "Graecia capta ferum victorem cepit." On the Roman conquest of Sicily the town secured an independence

under treaty (Cicero, *Verr.* 3. 6. 13). The inhabitants were still called Mamertines in the time of Strabo (vi. 2. 3).

See further Mommsen, *C.I.L.* x. sub loc., and the references already given.

(R. S. C.)

MĀMERTINUS, CLAUDIUS (4th century A.D.), one of the Latin panegyrists. After the death of Julian, by whom he was evidently regarded with special favour, he was praefect of Italy (365) under Valens and Valentinian, but was subsequently (368) deprived of his office for embezzlement. He was the author of an extant speech of thanks to Julian for raising him to the consulship, delivered on the 1st of January 362 at Constantinople. Two panegyrical addresses (also extant) to Maximian (emperor A.D. 286-305) are attributed to an older *magister* Mamertinus, but it is probable that the corrupt MS. superscription contains the word *memoriae*, and that they are by an unknown *magister memoriae* (an official whose duty consisted in communicating imperial rescripts and decisions to the public). The first of these was delivered on the birthday of Rome (April 21, 289), probably at Maximian's palace at Augusta Trevirorum (Trèves), the second in 290 or 291, on the birthday of the emperor. By some they are attributed to Eumenius (*q.v.*) who was a *magister memoriae* and the author of at least one (if not more) panegyrics.

The three speeches will be found in E. Bährens, *Panegyrici latini* (1874); see also Teuffel-Schwabe, *Hist. of Roman Literature* (Eng. trans.), § 417. 7.

MAMIANI DELLA ROVERE, TERENZIO, Count

(1802-1885), Italian writer and statesman, was born at Pesaro in 1799. Taking part in the outbreaks at Bologna arising out of the accession of Pope Gregory XVI., he was elected deputy for Pesaro to the assembly, and subsequently appointed minister of the interior; but on the collapse of the revolutionary movement he was exiled. He returned to Italy after the amnesty of 1846, and in 1848 he was entrusted with the task of forming a ministry. He remained prime minister, however, only for a few months, his political views being anything but in harmony with those of the pope. He subsequently retired to Genoa where he worked for Italian unity, was elected deputy in 1856, and in 1860 became minister of education under Cavour. In 1863 he was made minister to Greece, and in 1865 to Switzerland, and later senator and councillor of state. Meanwhile, he had founded at Genoa in 1849 the Academy of Philosophy, and in 1855 had been appointed professor of the history of philosophy at Turin; and he published several volumes, not only on philosophical and social subjects, but of poetry, among them *Rinnovamente della filosofia antica italiana* (1836), *Teoria della Religione e dello stato* (1869), *Kant e l'ontologia* (1879), *Religione dell' avenire* (1880), *Di un nuovo diritto europeo* (1843, 1857). He died at Rome on the 21st of May, 1885.

See *Indice delle opere di Terenzio Mamiani* (Pesaro, 1887); Gaspare, *Vita di Terenzio Mamiani* (Ancona, 1887); Barzellotti, *Studii e ritratti* (Bologna, 1893).

MAMMALIA (from Lat. *mamma*, a teat or breast), the name proposed by the Swedish naturalist Linnaeus for one of the classes, or primary divisions, of vertebrated animals, the members of which are collectively characterized by the presence in the females of special glands secreting milk for the nourishment of the young. With the exception of the lowest group, such glands always communicate with the exterior by means of the teats, nipples or mammae, from which the class derives its name. The class-name (modified by the French into *Mammifères*, and replaced in German by the practically equivalent term *Säugethiere*) has been anglicized into "Mammals" (mammal, in the singular). Of recent years, and more especially in America, it has become a custom to designate the study of mammals by the term "mammalogy." Etymologically, however, that designation cannot be justified; for it is of hybrid (Latin and Greek) origin, and is equivalent to "mastology," the science which deals with the mammary gland (Gr. μαστός, woman's breast), a totally different signification. As regards existing forms of life, the limitations of the class are perfectly well defined and easy of recognition; for although certain groups (not, by the way, whales, which, although excluded in popular estimation from the class, are in all essential respects typical mammals) are exceedingly aberrant, and present structural features connecting them with the lower vertebrate classes, yet they are by common consent retained in the class to which they are obviously most nearly affiliated by their preponderating characteristics. There is thus at the present day a great interval, unbridged by any connecting links, between mammals and the other classes of vertebrates.

Not so, however, when the extinct forms of vertebrate life are taken into consideration, for there is a group of reptiles from the early part of the Secondary, or Mesozoic period, some of whose members must have been so intimately related to mammals that, were the whole group fully known, it would clearly be impossible to draw a distinction between Mammalia on the one hand and Reptilia on the other. Indeed, as it is, we are already partially acquainted with one of these early intermediate creatures (*Tritylodon*), which forms a kind of zoological shuttlecock, being, so to speak, hit from one group to another, and back again, by the various zoologists by whom its scanty remains have been studied. Considered collectively, mammals, which did not make their appearance on the earth for some time after reptiles had existed, are certainly the highest group of the whole vertebrate sub-kingdom. This expression must not, however, be considered in too restricted a sense. In mammals, as in other classes, there are low as well as high forms; but by any tests that can be applied, especially those based on the state of development of the central nervous system, it will be seen that the average exceeds that of any other class, that many species of this class far excel those of any other in perfection of structure, and that it contains one form which is unquestionably the culminating point amongst organized beings.

Mammals, then, are vertebrated animals, possessing the normal characteristics of the members of that primary division of the animal kingdom. They are separated from fishes and batrachians (Pisces and Batrachians) on the one hand, and agree with reptiles, and birds (Reptilia and Aves) on the other, in the possession during intra-uterine life of the membranous vascular structures respectively known as the amnion and the allantois, and likewise in the absence at this or any other period of external gills. A four-chambered heart, with a complete double circulation, and warm blood (less markedly so in the lowest group than in the rest of the class), distinguish mammals from existing reptiles, although not from birds. From both birds and reptiles the class is distinguished, so far at any rate as existing forms are concerned, by the following features: the absence of a nucleus in the

red corpuscles of the blood, which are nearly always circular in outline; the free suspension of the lungs in a thoracic cavity, separated from the abdominal cavity by a muscular partition, or diaphragm, which is the chief agent in inflating the lungs in respiration; the aorta, or main artery, forming but a single arch after leaving the heart, which curves over the left terminal division of the windpipe, or bronchus; the presence of more or fewer hairs on the skin and the absence of feathers; the greater development of the bridge, or commissure, connecting the two halves of the brain, which usually forms a complete corpus callosum, or displays an unusually large size of its anterior portion; the presence of a fully developed larynx at the upper end of the trachea or windpipe, accompanied by the absence of a syrinx, or expansion, near the lower end of the same; the circumstance that each half of the lower jaw (except perhaps at a very early stage of development) consists of a single piece articulating posteriorly with the squamosal element of the skull without the intervention of a separate quadrate bone; the absence of prefrontal bones in the skull; the presence of a pair of lateral knobs, or condyles (in place of a single median one), on the occipital aspect of the skull for articulation with the first vertebra; and, lastly, the very obvious character of the female being provided with milk-glands, by the secretion of which the young (produced, except in the very lowest group, alive and not by means of externally hatched eggs) are nourished for some time after birth.

In the majority of mammals both pairs of limbs are well developed and adapted for walking or running. The fore-limbs may, however, be modified, as in moles, for burrowing, or, as in bats, for flight, or finally, as in whales and dolphins, for swimming, with the assumption in this latter instance of a flipper-like form and the complete disappearance of the hind-limbs. Special adaptations for climbing are exhibited by both pairs of limbs in opossums, and for hanging to boughs in sloths. In no instance are the fore-limbs wanting.

In the great majority of mammals the hind extremity of the axis of the body is prolonged into a tail. Very generally the tail has distinctly the appearance of

an appendage, but in some of the lower mammals, such as the thylacine among marsupials, and the aard-vark or ant-bear among the edentates, it is much thickened at the root, and passes insensibly into the body, after the fashion common among reptiles. As regards function, the tail may be a mere pendent appendage, or may be adapted to grasp boughs in climbing, or even to collect food or materials for a nest or sleeping place, as in the spider-monkeys, opossums and rat-kangaroos. Among jumping animals it may serve as a balance, as in the case of jerboas and kangaroos, while in the latter it is also used as a support when resting; among many hoofed mammals it is used as a fly-whisk; and in whales and dolphins, as well as in the African *Potamogale* and the North American musquash, it plays an important part in swimming. Its supposed use as a trowel by the beaver is, however, not supported by the actual facts of the case.

As already indicated, the limbs of different mammals are specially modified for various modes of life; and in many cases analogous modifications occur, in greater or less degree, throughout the entire body. Those modifications most noticeable in the case of cursorial types may be briefly mentioned as examples. In this case, as might be expected, the greatest modifications occur in the limbs, but correlated with this is also an elongation of the head and neck in long-legged types. Adaptation for speed is further exhibited in the moulding of the shape of the body so as to present the minimum amount of resistance to the air, as well as in increase in heart and lung capacity to meet the extra expenditure of energy. Finally, in the jumping forms we meet with an increase in the length and weight of the tail, which has to act as a counterpoise. As regards the feet, a reduction in the number of digits from the typical five is a frequent feature, more especially among the hoofed mammals, where the culmination in this respect is attained by the existing members of the horse tribe and certain representatives of the extinct South American *Proterotheriidae*, both of which are monodactyle. Brief reference may also be made to the morphological importance of extraordinary length or shortness in the skulls of mammals—dolichocephalism and brachycephalism; both these

features being apparently characteristic of specialized types, the former condition being (as in the horse) often, although not invariably, connected with length of limb and neck, and adaptation to speed, while brachycephalism may be correlated with short limbs and an abbreviated neck. Exceptions to this rule, as exemplified by the cats, are due to special adaptive causes. In point of bodily size mammals present a greater range of variation than is exhibited by any other living terrestrial animals, the extremes in this respect being displayed by the African elephant on the one hand and certain species of shrew-mice (whose head and body scarcely exceed an inch and a half in length) on the other. When the aquatic members of the class are taken into consideration, the maximum dimensions are vastly greater, Sibbald's rorqual attaining a length of fully 80 ft., and being probably the bulkiest and heaviest animal that has ever existed. Within the limits of individual groups, it may be accepted as a general rule that increase in bulk or stature implies increased specialization; and, further, that the largest representatives of any particular group are also approximately the latest. The latter dictum must not, however, be pushed to an extreme, since the African elephant, which is the largest living land mammal, attaining in exceptional cases a height approaching 12 ft., was largely exceeded in this respect by an extinct Indian species, whose height has been estimated at between 15 and 16 ft.

In regard to sense-organs, ophthalmoscopic observations on the eyes of living mammals (other than man) have revealed the existence of great variation in the arrangement of the blood-vessels, as well as in the colour of the retina; blue and violet seem to be unknown, while red, yellow and green form the predominating shades. In the main, the various types of minute ocular structure correspond very closely to the different groups into which mammals are divided, this correspondence affording important testimony in the favour of the general correctness of the classification. Among the exceptions are the South American squirrel-monkeys, whose eyes approximate in structure to those of the lemurs. Man and monkeys alone possess parallel and convergent vision of the two eyes, while a divergent, and

consequently a very widely extended, vision is a prerogative of the lower mammals; squirrels, for instance, and probably also hares and rabbits, being able to see an object approaching them directly from behind without turning their heads.

An osteological question which has been much discussed is the fate of the reptilian quadrate bone in the mammalian skull. In the opinion of F. W. Thyng, who has carefully reviewed all the other theories, the balance of evidence tends to show that the quadrate has been taken up into the inner ear, where it is represented among the auditory ossicles by the incus.

Although the present article does not discuss mammalian osteology in general (for which see VERTEBRATA), it is interesting to notice in this connexion that the primitive condition of the mammalian tympanum apparently consisted merely of a small and incomplete bony ring, with, at most, an imperfect ventral wall to the tympanic cavity, and that a close approximation to this original condition still persists in the monotremes, especially *Ornithorhynchus*. The tympano-hyal is the characteristic mammalian element in this region; but the entotympanic likewise appears to be peculiar to the class, and to be unrepresented among the lower vertebrates. The tympanum itself has been regarded as representing one of the elements—probably the supra-angular—of the compound reptilian lower jaw. The presence of only seven vertebrae in the neck is a very constant feature among mammals; the exceptions being very few.

Two other points in connexion with mammalian osteology may be noticed. A large number of mammals possess a perforation, or foramen, on the inner side of the lower end of the humerus, and also a projection on the shaft of the femur known as the third trochanter. From its occurrence in so many of the lower vertebrates, the entepicondylar foramen of the humerus, as it is called, is regarded by Dr E. Stromer as a primitive structure, of which the original object was to protect certain nerves and blood-vessels. It is remarkable that it should persist in the spectacled bear of the Andes, although it has disappeared

in all other living members of the group. The third trochanter of the femur, on the other hand, can scarcely be regarded as primitive, seeing that it is absent in several of the lower groups of mammals. Neither can its presence be attributed, as Professor A. Gaudry suggests, to the reduction in the number of the toes, as otherwise it should not be found in the rhinoceros. Its general absence in man forbids the idea of its having any connexion with the upright posture.

Hair.—In the greater number of mammals the skin is more or less densely clothed with a peculiarly modified form of epidermis known as hair. This consists of hard, elongated, slender, cylindrical or tapering, thread-like masses of epidermic tissue, each of which grows, without branching, from a short prominence, or papilla, sunk at the bottom of a pit, or follicle, in the true skin, or dermis. Such hairs, either upon different parts of the skin of the same species, or in different species, assume very diverse forms and are of various sizes and degrees of rigidity—as seen in the fur of the mole, the bristles of the pig, and the spines of the hedgehog and porcupine, which are all modifications of the same structures. These differences arise mainly from the different arrangement of the constituent elements into which the epidermal cells are modified. Each hair is composed usually of a cellular pithy internal portion, containing much air, and a denser or more horny external or cortical part. In some mammals, as deer, the substance of the hair is almost entirely composed of the central medullary or cellular substance, and is consequently very easily broken; in others the horny part prevails almost exclusively, as in the bristles of the wild boar. In the three-toed sloth (*Bradypus*) the hairs have a central horny axis and a pithy exterior. Though generally nearly smooth, or but slightly scaly, the surface of some hairs is imbricated; that is to say, shows projecting scale-like processes, as in some bats, while in the two-toed sloth (*Choloepus*) they are longitudinally grooved or fluted. Though usually more or less cylindrical or circular in section, hairs are often elliptical or flattened, as

in the curly-haired races of men, the terminal portion of the hair of moles and shrews, and conspicuously in the spines of the spiny squirrels of the genus *Xerus* and those of the mouse-like *Platacanthomys*. Hair having a property of mutual cohesion or "felting," which depends upon a roughened scaly surface and a tendency to curl, as in domestic sheep, is called "wool."

It has been shown by J. C. H. de Meijere that the insertion of the individual hairs in the skin displays a definite arrangement, constant for each species, but varying in different groups. In jerboas, for example, a bunch of twelve or thirteen hairs springs from the same point, while in the polar bear a single stout hair and several slender ones arise together, and in the marmosets three equal-sized hairs form regular groups. These tufts or groups likewise display an orderly and definite grouping in different mammals, which suggests the origin of such groups from the existence in primitive mammals of a scaly coat comparable to that of reptiles, and indeed directly inherited therefrom.

In a large proportion of mammals there exist hairs of two distinct types: the one long, stiff, and alone appearing on the surface, and the other shorter, finer and softer, constituting the under-fur, which may be compared to the down of birds. A well-known example is furnished by the fur-bearing seals, in which the outer fur is removed in the manufacture of commercial "seal-skin," leaving only the soft and fine under-fur.

Remarkable differences in the direction or slope of the hair are noticeable on different parts of the body and limbs of many mammals, especially in certain apes, where the hair of the fore-limbs is inclined towards the elbow from above and from below. More remarkable still is the fact that the direction of the slope often differs in closely allied groups, as, for instance, in African and Asiatic buffaloes, in which the hair of the middle line of the back has opposite directions. Whorls of hair,

as on the face of the horse and the South American deer known as brockets, occur where the different hair-slopes meet. In this connexion reference may be made to patches or lines of long and generally white hairs situated on the back of certain ruminants, which are capable of erection during periods of excitement, and serve, apparently, as “flags” to guide the members of a herd in flight. Such are the white chrysanthemum-like patches on the rump of the Japanese deer and of the American prong-buck (*Antilocapra*), and the line of hairs situated in a groove on the loins of the African spring-buck. The white underside of the tail of the rabbit and the yellow rump-patch of many deer are analogous.

The eye-lashes, or *ciliae*, are familiar examples of a special local development of hair. Special tufts of stout stiff hairs, sometimes termed *vibrissae*, and connected with nerves, and in certain cases with glands, occur in various regions. They are most common on the head, while they constitute the “whiskers,” or “feelers,” of the cats and many rodents. In other instances, notably in the lemurs, but also in certain carnivora, rodents and marsupials, they occupy a position on the fore-arm near the wrist, in connexion with glands, and receive sensory powers from the radial nerve. In some mammals the hairy covering is partial and limited to particular regions; in others, as the hippopotamus and the sea-cows, or Sirenia, though scattered over the whole surface, it is extremely short and scanty; but in none is it reduced to so great an extent as in the Cetacea, in which it is limited to a few small bristles confined to the neighbourhood of the lips and nostrils, and often present only in the young, or even the foetal condition.

Some kinds of hairs, as those of the mane and tail of the horse, persist throughout life, but more generally, as in the case of the body-hair of the same animal, they are shed and renewed periodically, generally annually. Many mammals have a longer hairy coat in winter, which is shed as

summer comes on; and some few, which inhabit countries covered in winter with snow, as the Arctic fox, variable hare and ermine, undergo a complete change of colour in the two seasons, being white in winter and grey or brown in summer. There has been much discussion as to whether this winter whitening is due to a change in the colour of the individual hairs or to a change of coat. It has, however, been demonstrated that the senile whitening of human hair is due to the presence of phagocytes, which devour the pigment-bodies; and from microscopic observations recently made by the French naturalist Dr E. Trouessart, it appears that much the same kind of action takes place in the hairs of mammals that turn white in winter. Cold, by some means or other, causes the pigment-bodies to shift from the normal positions, and to transfer themselves to other layers of the hair, where they are attacked and devoured by phagocytes. The winter whitening of mammals is, therefore, precisely similar to the senile bleaching of human hair, no shift of the coat taking place. Under the influence of exposure to intense cold a small mammal has been observed to turn white in a single night, just as the human hair has been known to blanch suddenly under the influence of intense emotion, and in both cases extreme activity of the phagocytes is apparently the inducing cause. The African golden-moles (*Chrysochloris*), the desmans or water-moles (*Myogale*), and the West African *Potamogale velox*, are remarkable as being the only mammals whose hair reflects those iridescent tints so common in the feathers of tropical birds.

The principal and most obvious purpose of the hairy covering is to protect the skin. Its function in the hairless Cetacea is discharged by the specially modified and thickened layer of fatty tissue beneath the skin known as “blubber.”

Scales, &c.—True scales, or flat imbricated plates of horny material, covering the greater part of the body, are found in one family only of

mammals, the pangolins or *Manidae*; but these are also associated with hairs growing from the intervals between the scales or on the parts of the skin not covered by them. Similarly imbricated epidermic productions form the covering of the under-surface of the tail of the African flying rodents of the family *Anomaluridae*; and flat scutes, with the edges in apposition, and not overlaid, clothe both surfaces of the tail of the beaver, rats and certain other members of the rodent order, and also of some insectivora and marsupials. Armadillos alone possess an external bony skeleton, composed of plates of bony tissue, developed in the skin and covered with scutes of horny epidermis. Other epidermic appendages are the horns of ruminants and rhinoceroses—the former being elongated, tapering, hollow caps of hardened epidermis of fibrous structure, fitting on and growing from conical projections of the frontal bones and always arranged in pairs, while the latter are of similar structure, but without any internal bony support, and situated in the middle line. Callosities, or bare patches covered with hardened and thickened epidermis, are found on the buttocks of many apes, the breast of camels, the inner side of the limbs of *Equidae*, the grasping under-surface of the tail of prehensile-tailed monkeys, opossums, &c. The greater part of the skin of the one-horned Asiatic rhinoceros is immensely thickened and stiffened by an increase of the tissue of both the skin and epidermis, constituting the well-known jointed “armour-plated” hide of those animals.

Nails, Claws and Hoofs.—With few exceptions, the terminal extremities of the digits of both limbs of mammals are more or less protected or armed by epidermic plates or sheaths, constituting the various forms of nails, claws or hoofs. These are absent in the Cetacea alone. A perforated spur, with a special secreting gland in connexion with it, is found attached to each hind-leg of the males of the existing species of Monotremata.

Scent-glands, &c.—Besides the universally distributed sweat-glands connected with the hair-system, most mammals have special glands in modified portions of the skin, often involuted to form a shallow recess or a deep sac with a narrow opening, situated in various parts of the surface of the body, and secreting odorous substances, by the aid of which individuals recognize one another. These probably afford the principal means by which wild animals are able to become aware of the presence of other members of the species, even at great distances.

To this group of structures belong the suborbital face-gland, "larmier," or "crumen," of antelopes and deer, the frontal gland of the muntjak and of bats of the genus *Phyllorhina*, the chin-gland of the chevrotains and of *Taphozous* and certain other bats, the glandular patch behind the ear of the chamois and the reed-buck, the glands on the lower parts of the legs of most deer and a few antelopes (the position of which is indicated by tufts of long and often specially coloured hair), the interdigital foot-glands of goats, sheep, and many other ruminants, the temporal gland of elephants, the lateral glands of the musk-shrew, the gland on the back of the hyrax and the peccary (from the presence of which the latter animal takes the name *Dicotyles*), the gland on the tails of the members of the dog-tribe, the preputial glands of the musk-deer and beaver (both well known for the use made of their powerfully odorous secretion in perfumery), and also of the swine and hare, the anal glands of Carnivora, the perineal gland of the civet (also of commercial value), the caudal glands of the fox and goat, the gland on the wing-membrane of bats of the genus *Saccopteryx*, the post-digital gland of the rhinoceros, &c. Very generally these glands are common to both sexes, and it is in such cases that their function as a means of mutual recognition is most evident. It has been suggested that the above-mentioned callosities or "chestnuts" on the limbs of horses are vestigial scent-glands; and it is noteworthy that scrapings or shavings from their surface have a powerful attraction for other horses, and are also used by poachers and burglars to keep dogs

silent. The position of such glands on the lower portions of the limbs is plainly favourable to a recognition-taint being left in the tracks of terrestrial animals; and antelopes have been observed deliberately to rub the secretion from their face-glands on tree-trunks. When glands are confined to the male, their function is no doubt sexual; the secretion forming part of the attraction, or stimulus, to the other sex.

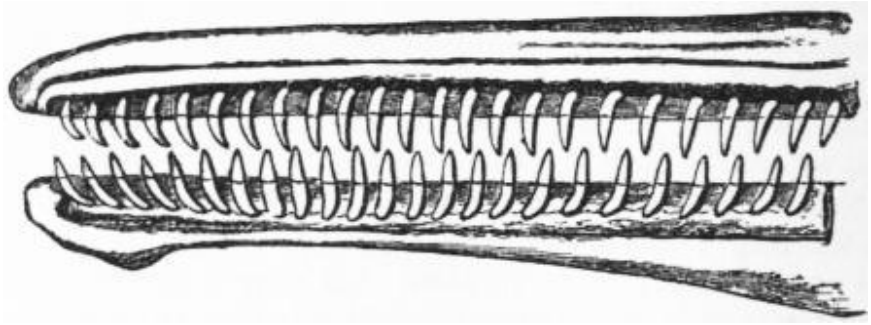


FIG. 1.—Upper and Lower Teeth of one side of the Mouth of a Dolphin (*Lagenorhynchus*), as an example of the homoeodont type of dentition. The bone covering the outer side of the roots of the teeth has been removed to show their simple character.

Dentition.—In the great majority of mammals the teeth form a definite series, of which the hinder elements are of a more or less complex type, while those in front are simpler. With the exception of the marsupials, a set of deciduous, or milk, teeth is developed in most mammals with a complicated type of dentition; these milk-teeth being shed at a comparatively early period (occasionally even *in utero*), when they are succeeded by the larger permanent series, which is the only other ever developed. This double series of teeth thus forms a very characteristic feature of mammals generally. Both the milk and the permanent dentition display the aforesaid complexity of the hinder teeth as compared with those in front, and since the number of milk-teeth is always considerably less than that of the permanent set, it follows that the hinder milk-teeth are usually more complex than the teeth of which they are the

predecessors in the permanent series, and represent functionally, not their immediate successors, but those more posterior permanent teeth which have no direct predecessors. This character is clearly seen in those animals in which the various members of the lateral or cheek series are well differentiated from each other in form, as the Carnivora, and also in man.

In mammals with two sets of teeth the number of those of the permanent series preceded by milk-teeth varies greatly, being sometimes, as in marsupials and some rodents, as few as one on each side of each jaw, and in other cases including the larger portion of the series. As a rule, the teeth of the two sides of the jaws are alike in number and character, except in cases of accidental or abnormal variation, and in the tusks of the narwhal, in which the left is of immense size, and the right rudimentary. In mammals, such as dolphins and some armadillos, which have a large series of similar teeth, not always constant in number in different individuals, there may indeed be differences in the two sides; but, apart from these in describing the dentition of any mammal, it is generally sufficient to give the number and characters of the teeth of one side only. As the teeth of the upper and the lower jaws work against each other in masticating, there is a general correspondence or harmony between them, the projections of one series, when the mouth is closed, fitting into corresponding depressions of the other. There is also a general resemblance in the number, characters and mode of succession of both series; so that, although individual teeth of the upper and lower jaws may not be in the strict sense of the term homologous parts, there is a great convenience in applying the same descriptive terms to the one which are used for the other.

The simplest dentition is that of many species of dolphin (fig. 1), in which the crowns are single-pointed, slightly curved cones, and the roots also single and tapering; so that all the teeth are alike in form from the

anterior to the posterior end of the series, though it may be with some slight difference in size, those at the two extremities being rather smaller than the others. Such a dentition is called “homoeodont” (Gr. ὅμοιος, like, ὀδούς, tooth), and in the case cited, as the teeth are never changed, it is also monophyodont (Gr. μόνος, alone, single, φύειν, to generate, ὀδούς, tooth). Such teeth are adapted only for catching slippery living prey, like fish.

In a very large number of mammals the teeth of different parts of the series are more or less differentiated in character; and, accordingly, have different functions to perform. The front teeth are simple and one-rooted, and are adapted for cutting and seizing. They are called “incisors.” The back, lateral or cheek teeth, on the other hand, have broader and more complex crowns, tuberculated or ridged, and supported on two or more roots. They crush or grind the food, and are hence called “molars.” Many mammals have, between these two sets, a tooth at each corner of the mouth, longer and more pointed than the others, adapted for tearing or stabbing, or for fixing struggling prey. From the conspicuous development of such teeth in the Carnivora, especially the dogs, they have received the name of “canines.” A dentition with its component parts so differently formed that these distinctive terms are applicable to them is called heterodont (Gr. ἕτερος, different). In most cases, though by no means invariably, mammals with a heterodont dentition are also diphyodont (Gr. διφυής, of double form).

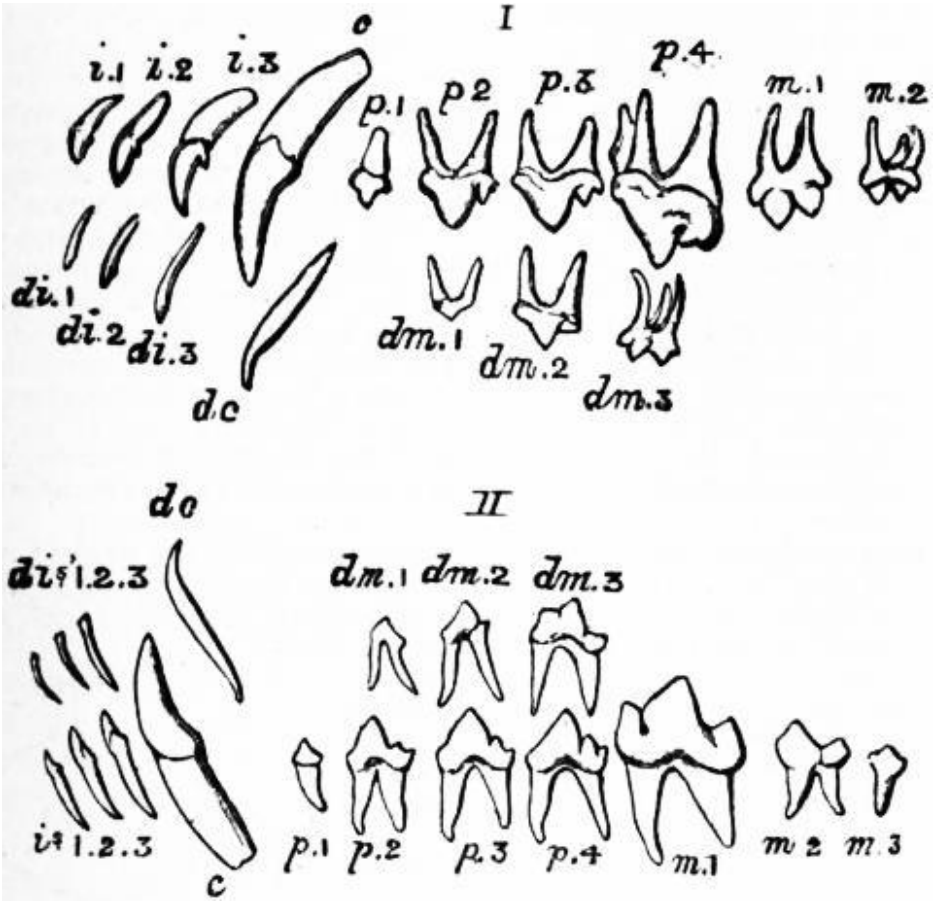


FIG. 2.—Milk and Permanent Dentitions of Upper (I.) and Lower (II.) Jaws of the Dog (*Canis*), with the symbols by which the different teeth are designated. The third upper molar (*m* 3) is the only tooth wanting to complete the typical heterodont mammalian dentition.

This general arrangement is obvious in a considerable number of mammals; and examination shows that, under great modifications in detail, there is a remarkable uniformity of essential characters in the dentition of a large number of members of the class belonging to different orders and not otherwise closely allied, so much that it is possible to formulate a common plan of dentition from which the others have been derived by the alteration of some and the suppression of other members of the series, and occasionally, but very rarely, by addition. In this generalized form of mammalian dentition the total number of teeth

present is 44, or 11 above and 11 below on each side. Those of each jaw are placed in continuous series without intervals between them; and, although the anterior teeth are simple and single-rooted, and the posterior teeth complex and with several roots, the transition between the two kinds is gradual.

In dividing and grouping such teeth for the purpose of description and comparison more definite characters are required than those derived merely from form or function. The first step towards a classification rests on the fact that the upper jaw is composed of two bones, the premaxilla and the maxilla, and that the division or suture between these bones separates the three front teeth from the rest. These three teeth, which are implanted in the premaxilla, form a distinct group, to which the name of "incisor" is applied. This distinction is, however, not so important as it appears at first sight, for their connexion with the bone is only of a secondary nature, and, although it happens conveniently that in the great majority of cases the division between the bones coincides with the interspace between the third and fourth tooth of the series, still, when it does not, as in the mole, too much weight must not be given to this fact, if it contravenes other reasons for determining the homologies of the teeth. The eight remaining teeth of the upper jaw offer a natural division, inasmuch as the three hindmost never have milk-predecessors; and, although some of the anterior teeth may be in the same case, the particular one preceding these three always has such a predecessor. These three, then, are grouped as the "molars." Of the five teeth between the incisors and molars the most anterior, or the one usually situated close behind the pre-maxillary suture, very generally assumes a lengthened and pointed form, and constitutes the "canine" of the Carnivora, the tusk of the boar, &c. It is customary, therefore, to call this tooth, whatever its size or form, the "canine." The remaining four are the "premolars." This system has been objected to as artificial, and in many cases not descriptive, the distinction between premolars and canine especially

being sometimes not obvious; but the terms are now in such general use, and also so convenient, that it is not likely they will be superseded. It is frequently convenient to refer to all the teeth behind the canine as the "cheek-teeth."

With regard to the lower teeth the difficulties are greater, owing to the absence of any suture corresponding to that which defines the incisors above; but since the number of the teeth is the same, since the corresponding teeth are preceded by milk-teeth, and since in the large majority of cases it is the fourth tooth of the series which is modified in the same way as the canine (or fourth tooth) of the upper jaw, it is reasonable to adopt the same divisions as with the upper series, and to call the first three, which are implanted in the part of the mandible opposite to the premaxilla, the incisors, the next the canine, the next four the premolars, and the last three the molars.

It may be observed that when the mouth is closed, especially when the opposed surfaces of the teeth present an irregular outline, the corresponding upper and lower teeth are not exactly opposite, otherwise the two series could not fit into one another, but as a rule the points of the lower teeth shut into the interspaces in front of the corresponding teeth of the upper jaw. This is very distinct in the canine teeth of the Carnivora, and is a useful guide in determining the homologies of the teeth of the two jaws.

For the sake of brevity the complete dentition is described by the following formula, the numbers above the line representing the teeth of the upper, those below the line those of the lower jaw: incisors (3—3)/(3—3), canines (1—1)/(1—1), premolars (4—4)/(4—4), molars, (3—3)/(3—3) = (11—11)/(11—11) total 44. As, however, initial letters may be substituted for the names of each group, and it is unnecessary to give more than the numbers of the teeth on one side of the mouth, the formula may be abbreviated into:

$i\ ^{3}/_{3}$, $c\ ^{1}/_{1}$, $p\ ^{4}/_{4}$, $m\ ^{3}/_{3}$; total 44.

The individual teeth of each group are enumerated from before backwards, and by such a formula as the following:—

$$\frac{i\ 1, i\ 2, i\ 3, c, p\ 1, p\ 2, p\ 3, p\ 4, m\ 1, m\ 2, m\ 3}{i\ 1, i\ 2, i\ 3, c, p\ 1, p\ 2, p\ 3, p\ 4, m\ 1, m\ 2, m\ 3}$$

a special numerical designation is given by which each one can be indicated. In mentioning any single tooth, such a sign as $\underline{\text{m1}}$ will mean the first upper molar, $\overline{\text{m1}}$ the first lower molar, and so on.

When, as is the case among nearly all existing mammals with the exception of the members of the genera *Sus* (pigs), *Gymnura* (rat-shrew), *Talpa* (moles) and *Myogale* (desmans) the number of teeth is reduced below the typical forty-four, it appears to be an almost universal rule that if one of the incisors is missing it is the second, or middle one, while the premolars commence to disappear from the front end of the series and the molars from the hinder end.

The milk-dentition is expressed by a similar formula, *d* for deciduous, being added before the letter expressive of the nature of the tooth. As the three molars and (almost invariably) the first premolar of the permanent series have no predecessors, the typical milk-dentition would be expressed as follows: $di\ ^{3}/_{3}$, $dc\ ^{1}/_{1}$, $dm\ ^{3}/_{3} = 28$. The teeth which precede the premolars of the permanent series are called either milk-molar or milk-premolar. When there is a marked difference between the premolars and molars of the permanent dentition, the first milk-molar resembles a premolar, while the last has the characters of the posterior molar. It is sometimes convenient to refer to all the seven cheek-teeth as members of a single continuous series (which they undoubtedly are), and for this purpose the following nomenclature has been proposed:—

		Upper Jaw.	Lower Jaw.
Cheek-tooth	1	Protus.	Protid.
”	2	Deuterus.	Deuterid.
”	3	Tritus.	Tritid.
”	4	Tetartus.	Tetartid.
”	5	Pemptus.	Pemptid.
”	6	Hectus.	Hectid.
”	7	Hebdomus.	Hebdomid.

With the exception of the Cetacea, most of the Edentata, and the Sirenia, in which the teeth, when present, have been specialized in a retrograde or aberrant manner, the placental mammals as a whole have a dentition conforming more or less closely to the foregoing type.

With the marsupials the case is, however, somewhat different; the whole number not being limited to 44, owing largely to the fact that the number of upper incisors may exceed three pairs, reaching indeed in some instances to as many as five. Moreover, with the exception of the wombats, the number of pairs of incisors in the upper always exceeds those in the lower. When fully developed, the number of cheek-teeth is, however, seven; and it is probable that, as in placentals, the first four of these are premolars and the remaining three molars, although it was long held that these numbers should be transposed. The most remarkable feature about the marsupial dentition is that, at most, only a single pair of teeth is replaced in each jaw; this pair, on the assumption that there are four premolars, representing the third of that series. With the exception of this replacing pair of teeth in each jaw, it is considered by many authorities that the marsupial dentition corresponds to the deciduous, or milk, dentition of placentals. If this be really the case, the rudiments of an earlier set of teeth which have been detected in the jaws of some members of the order, represent, not the milk-series, but a prelacteal

dentition. On the assumption that these functional teeth correspond to the milk-series of placentals, marsupials in this respect agree exactly with modern elephants, in which the same peculiarity exists.

In very few mammals are teeth entirely absent. Even in the whalebone whales their germs are formed in the same manner and at the same period of life as in other mammals, and even become partially calcified, although they never rise above the gums, and completely disappear before birth. In the American anteaters and the pangolins among the Edentata no traces of teeth have been found at any age. Adult monotremes are in like case, although the duck-billed platypus (*Ornithorhynchus*) has teeth when young on the sides of the jaws. The northern sea-cow (*Rhytina*), now extinct, appears to have been toothless throughout life.

In different groups of mammals the dentition is variously specialized in accordance with the nature of the food on which the members of these groups subsist. From this point of view the various adaptive modifications of mammalian dentition may be roughly grouped under the headings of piscivorous, carnivorous, insectivorous, omnivorous and herbivorous.

The fish-eating, or piscivorous, type of dentition is exemplified under two phases in the dolphins and in the seals (being in the latter instance a kind of retrograde modification from the carnivorous type). In the dolphins, and in a somewhat less marked degree among the seals, this type of dentition consists of an extensive series of conical, nearly equal-sized, sharp-pointed teeth, implanted in an elongated and rather narrow mouth (fig. 1), and adapted to seize slippery prey without either tearing or masticating. In the dolphins the teeth form simple cones, but in the seals they are often trident-like; while in the otters the dentition differs but little from the ordinary carnivorous type.

This carnivorous adaptation, in which the function is to hold and kill struggling animals, often of large size, attains its highest development in the cats (*Felidae*). The canines are in consequence greatly developed, of a cutting and piercing type, and from their wide separation in the mouth give a firm hold; the jaws being as short as is consistent with the free action of the canines, or tusks, so that no power is lost. The incisors are small, so as not to interfere with the penetrating action of the tusks; and the crowns of some of the teeth of the cheek-series are modified into scissor-like blades, in order to rasp off the flesh from the bones, or to crack the bones themselves, while the later teeth of this series tend to disappear.

In the insectivorous type, as exemplified in moles and shrew-mice, the middle pair of incisors in each jaw are long and pointed so as to have a forceps-like action for seizing insects, the hard coats of which are broken up by the numerous sharp cusps surmounting the cheek-teeth.

In the omnivorous type, as exemplified in man and monkeys, and to a less specialized degree in swine, the incisors are of moderate and nearly equal size; the canines, if enlarged, serve for other purposes than holding prey, and such enlargement is usually confined to those of the males; while the cheek-teeth have broad flattened crowns surmounted by rounded bosses, or tubercles.

In the herbivorous modification, as seen in three distinct phases in the horse, the kangaroo, and in ruminants, the incisors are generally well developed in one or both jaws, and have a nipping action, either against one another or against a toothless hard pad in the upper jaw; while the canines are usually small or absent, at least in the upper jaw, but in the lower jaw may be approximated and assimilated to the incisors. The cheek-teeth are large, with broad flattened crowns surmounted either by simple transverse ridges, or complicated by elevations and infoldings. In the specialized forms the premolars tend to become more or less

completely like the molars; and, contrary to what obtains among the Carnivora, the whole series of cheek-teeth (with the occasional exception of the first) is very strongly developed.

Opinions differ as to the mode in which the more complicated cheek-teeth of mammals have been evolved from a simpler type of tooth. According to one theory, this has been brought about by the fusion of two or more teeth of a simple conical type to form a compound tooth. A more generally accepted view—especially among palaeontologists—is the tritubercular theory, according to which the most generalized type of tooth consists of three cusps arranged in a triangle, with the apex pointing inwards in the teeth of the upper jaw. Additions of extra cusps form teeth of a more complicated type. Each cusp of the primitive triangle has received a separate name, both in the teeth of the upper and of the lower jaw, while names have also been assigned to super-added cusps. Molar teeth of the simple tritubercular type persist in the golden moles (*Chrysochloris*) among the Insectivora and also in the marsupial mole (*Notoryctes*) among the marsupials. The type is, moreover, common among the mammals of the early Eocene, and still more so in those of the Jurassic epoch; this forming one of the strongest arguments in favour of the tritubercular theory. (See Professor H. F. Osborn, "Palaeontological Evidence for the Original Tritubercular Theory," in vol. xvii. (new series) of the *American Journal of Science*, 1904.)

Digestive System.—As already mentioned, mammals are specially characterized by the division of the body-cavity into two main chambers, by means of the horizontal muscular partition known as the diaphragm, which is perforated by the great blood-vessels and the alimentary tube. The mouth of the great majority of mammals is peculiar for being guarded by thick fleshy lips, which are, however, absent in the Cetacea; their principal function being to seize the food, for which purpose they are endowed, as a rule, with more or less strongly marked prehensile

power. The roof of the mouth is formed by the palate, terminating behind by a muscular, contractile arch, having in man and a few other species a median projection called the uvula, beneath which the mouth communicates with the pharynx. The anterior part of the palate is composed of mucous membrane tightly stretched over the flat or slightly concave bony layer which separates the mouth from the nasal passages, and is generally raised into a series of transverse ridges, which sometimes, as in ruminants, attain a considerable development. In the floor of the mouth, between the two branches of the lower jaw, and supported behind by the hyoid apparatus, lies the tongue, an organ the free surface of which, especially in its posterior part, is devoted to the sense of taste, but which by reason of its great mobility (being composed almost entirely of muscular fibres) performs important mechanical functions connected with masticating and procuring food. Its modifications of form in different mammals are numerous. Between the long, extensile, worm-like tongue of the anteaters, essential to the peculiar mode of feeding of those animals, and the short, immovable and almost functionless tongue of the porpoise, every intermediate condition is found. Whatever the form, the upper surface is, however, covered with numerous fine papillae, in which the terminal filaments of the taste-nerve are distributed. In some mammals, notably lemurs, occurs a hard structure known as the sublingua, which may terminate in a free horny tip. If, as has been suggested, this organ represents the tongue of reptiles, the mammalian tongue will obviously be a super-added organ distinctive of the class.

Salivary glands, of which the most constant are the parotid and the submaxillary, are always present in terrestrial mammals. Next in constancy are the “sublingual,” closely associated with the last-named, at all events in the locality in which the secretion is poured out; and the “zygomatic,” found only in some mammals in the cheek, just under cover

of the anterior part of the zygomatic arch, the duct entering the mouth-cavity near that of the parotid.

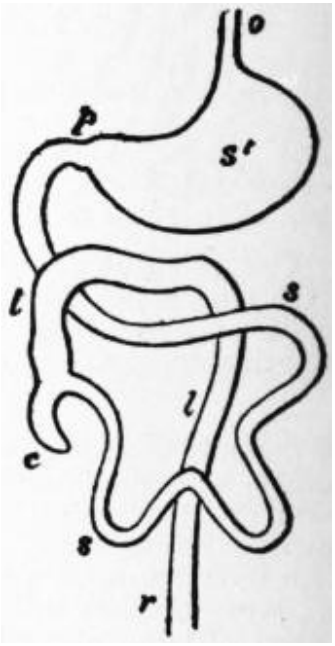


FIG. 3.—Diagrammatic Plan of the general arrangement of the Alimentary Canal in a typical Mammal.

o, oesophagus;
st, stomach;
p, pylorus;
ss, small intestine (abbreviated);
c, caecum;
ll, large intestine or colon, ending in
r, the rectum.

The alimentary, or intestinal, canal varies greatly in relative length and capacity in different mammals, and also offers manifold peculiarities of form, being sometimes a simple cylindrical tube of nearly uniform calibre throughout, but more often subject to alterations of form and capacity in different portions of its course—the most characteristic and constant being the division into an upper and narrower and a lower and wider portion, called respectively the small and the large intestine; the former being arbitrarily divided into duodenum, jejunum and ileum, and the latter into colon and rectum. One of the most striking peculiarities of this part of the canal is the frequent presence of a blind pouch, "caecum," situated at the junction of the large and the small intestine. Their structure presents an immense variety of development, from the smallest bulging of a portion of the side-wall of the tube to a huge and complex sac, greatly exceeding in capacity the remainder of the alimentary canal. It is only in herbivorous mammals that the caecum is developed to this great extent, and among these there is a complementary relationship between the size and complexity of the organ and that of the stomach. Where the latter is simple the caecum is generally the largest, and vice versa. In vol. xvii.

(1905) of the *Transactions* of the Zoological Society of London, Dr P. Chalmers Mitchell has identified the paired caeca, or blind appendages, of the intestine of birds with the usually single caecum of mammals. These caeca occur in birds (as in mammals) at the junction of the small with the large intestine; and while in ordinary perching-birds they are reduced to small nipple-like buds of no functional importance, in many other birds—owls for instance—they form quite long receptacles. Among mammals, the horse and the dog may be cited as instances where the single caecum is of large size, this being especially the case of the former, where it is of enormous dimensions; in human beings, on the other hand, the caecum is rudimentary, and best known in connexion with "appendicitis." The existence of paired caeca was previously known in a few armadillos and anteaters, but Dr Mitchell has shown that they are common in these groups, while he has also recorded their occurrence in the hyrax and the manati. With the aid of these instances of paired caeca, coupled with the frequent existence of a rudiment of its missing fellow when only one is functional, the author has been enabled to demonstrate conclusively that these double organs in birds correspond in relations with their normally single representative in mammals.

In mammals both caecum and colon are often sacculated, a disposition caused by the arrangement of the longitudinal bands of muscular tissue in their walls; but the small intestine is always smooth and simple-walled externally, though its lining membrane often exhibits contrivances for increasing the absorbing surface without adding to the general bulk of the organ, such as the numerous small tags, or "villi," by which it is everywhere beset, and the more obvious transverse, longitudinal, or reticulating folds projecting into the interior, met with in many animals, of which the "valvulae conniventes" of man form well-known examples. Besides the crypts of Lieberkühn found throughout the intestinal canal, and the glands of Brunner confined to the duodenum, there are other structures in the mucous membrane, about the nature of which there is

still much uncertainty, called "solitary" and "agminated" glands, the latter more commonly known by the name of "Peyer's patches." Of the liver little need be said, except that in all living mammals it has been divided into a number of distinct lobes, which have received separate names. It has, indeed, been suggested that in the earlier mammals the liver was a simple undivided organ. This, however, is denied by G. Ruge (vol. xxix. of Gegenbaur's *Morphologisches Jahrbuch*).

Origin of Mammals.—That mammals have become differentiated from a lower type of vertebrates at least as early as the commencement of the Jurassic period is abundantly testified by the occurrence of the remains of small species in strata of that epoch, some of which are mentioned in the articles MARSUPIALIA and MONOTREMATA (*q.v.*). Possibly mammalian remains also occur in the antecedent Triassic epoch, some palaeontologists regarding the South African *Tritylodon* as a mammal, while others consider that it was probably a reptile. Whatever may be the true state of the case with regard to that animal probably also holds good in the case of the approximately contemporaneous European *Microlestes*. Of the European Jurassic (or Oolitic) mammals our knowledge is unfortunately very imperfect; and from the scarcity of their remains it is quite probable that they are merely stragglers from the region (possibly Africa) where the class was first differentiated. It is not till the early Eocene that mammals become a dominant type in the northern hemisphere.

It is now practically certain that mammals are descended from reptiles. Dr H. Gadow, in a paper on the origin of mammals contributed to the *Zeitschrift für Morphologie*, sums up as follows: "Mammals are descendants of reptiles as surely as they [the latter] have been evolved from Amphibia. This does not mean that any of the living groups of reptiles can claim their honour of ancestry, but it means that the mammals have branched where the principal reptilian groups meet, and that is a long way back. The Theromorpha, especially small Theriodontia, alone show us what these creatures were like."

It may be explained that the Theromorpha, or Anomodontia, are those extinct reptiles so common in the early Secondary (Triassic) deposits of South Africa, some of which present a remarkable resemblance in their dentition and skeleton to mammals, while others come equally near amphibians. A difficulty naturally arises with regard to the fact that in reptiles the occipital condyle by which the skull articulates with the vertebral column is single, although composed of three elements, whereas in amphibians and mammals the articulation is formed by a pair of condyles. Nevertheless, according to Professor H. F. Osborn, the tripartite reptilian condyle, by the loss of its median element, has given rise to the paired mammalian condyles; so that this difficulty disappears. The fate of the reptilian quadrate bone (which is reduced to very small dimensions in the Anomodontia) has been referred to in an earlier section of the present article, where some mention has also been made of the disappearance in mammals of the hinder elements of the reptilian lower jaw, so as to leave the single bone (dentary) of each half of this part of the skeleton in mammals.

Most of the earliest known mammals appear to be related to the Marsupialia and Insectivora. Others however (inclusive of *Tritylodon* and *Microlestes*, if they be really mammals), seem nearer to the Monotremata; and the question has yet to be decided whether placentals and marsupials on the one hand, and monotremes on the other are not independently derived from reptilian ancestors.

With regard to the evolution of marsupials and placentals, it has been pointed out that the majority of modern marsupials exhibit in the structure of their feet traces of the former opposability of the thumb and great toe to the other digits; and it has accordingly been argued that all marsupials are descended from arboreal ancestors. This doctrine is now receiving widespread acceptation among anatomical naturalists; and in the *American Naturalist* for 1904, Dr W. D. Matthew, an American palaeontologist, considers himself provisionally justified in so extending it as to include all mammals. That is to

say, he believes that, with the exception of the duckbill and the echidna, the mammalian class as a whole can lay claim to descent from small arboreal forms. This view is, of course, almost entirely based upon palaeontological considerations; and these, in the author's opinion, admit of the conclusion that all modern placental and marsupial mammals are descended from a common ancestral stock, of which the members were small in bodily size. These ancestral mammals, in addition to their small size, were characterized by the presence of five toes to each foot, of which the first was more or less completely opposable to the other four. The evidence in favour of this primitive opposability is considerable. In all the groups which are at present arboreal, the palaeontological evidence goes to show that their ancestors were likewise so; while since, in the case of modern terrestrial forms, the structure of the wrist and ankle joints tends to approximate to the arboreal type, as we recede in time, the available evidence, so far as it goes, is in favour of Dr Matthew's contention.

The same author also discusses the proposition from another standpoint, namely, the condition of the earth's surface in Cretaceous times. His theory is that in the early Cretaceous epoch the animals of the world were mostly aerial, amphibious, aquatic or arboreal; the flora of the land being undeveloped as compared with its present state. On the other hand, towards the close of the Cretaceous epoch (when the Chalk was in course of deposition), the spread of a great upland flora vastly extended the territory available for mammalian life. Accordingly, it was at this epoch that the small ancestral insectivorous mammals first forsook their arboreal habitat to try a life on the open plains, where their descendants developed on the one hand into the carnivorous and other groups, in which the toes are armed with nails or claws, and on the other into the hoofed group, inclusive of such monsters as the elephant and the giraffe. The hypothesis is not free from certain difficulties, one of which will be noticed later.

Classification.—Existing mammals may be primarily divided into three main groups, or subclasses, of which the second and third are much more closely related to one another than is either of them to the first. These three classes are the Monotremata (or Prototheria), the Marsupialia (Didelphia, or Metatheria), and the Placentalia (Monodelphia, or Eutheria); the distinctive characters of each being given in separate articles (see MONOTREMATA, MARSUPIALIA and MONODELPHIA.)

The existing monotremes and marsupials are each represented only by a single order; but the placentals are divided into the following ordinal and subordinal groups, those which are extinct being marked with an asterisk (*):—

1. Insectivora (Moles, Hedgehogs, &c.).
2. Chiroptera (Bats).
3. Dermoptera (Colugo, or Flying Lemur).
4. Edentata:—
    a. Xenarthra (Anteaters, Sloths and Armadillos).
    b. Pholidota (Pangolins).
    c. Tubulidentata (Ant-bears, or Aard-varks).
5. Rodentia (Gnawing Mammals):—
    a. Duplicidentata (Hares and Picas).
    b. Simplicidentata (Rats, Beavers, &c.).
6. *Tillodontia (*Tillotherium*).
7. Carnivora:—
    a. Fissipedia (Cats, Dogs, Bears, &c.).
    b. Pinnipedia (Seals and Walruses).
    c. *Creodonta (*Hyaenodon*, &c.).
8. Cetacea (Whales and Dolphins):—
    a. *Archaeoceti (*Zeuglodon*, &c.).
    b. Odontoceti (Spermwhales and Dolphins).
    c. Mystacoceti (Whalebone Whales).

9. Sirenia (Dugongs and Manatis).
10. Ungulata (Hoofed Mammals):—
    a. Proboscidea (Elephants and Mastodons).
    b. Hyracoidea (Hyraxes).
    c. *Barypoda (*Arsinöitherium*).
    d. *Toxodontia (*Toxodon*, &c.).
    e. *Amblypoda (*Uintatherium*, &c.).
    f. *Litopterna (*Macrauchenia*, &c.).
    g. *Ancylopoda (*Chalicotherium*, &c.).
    h. *Condylarthra (*Phenacodus*, &c.).
    i. Perissodactyla (Tapirs, Horses, &c.).
    j. Artiodactyla (Ruminants, Swine, &c.).
11. Primates:—
    a. Prosimiae (Lemurs and Galagos).
    b. Anthropoidea (Monkeys, Apes and Man).

Separate articles are devoted to each of these orders, where references will be found to other articles dealing with some of the minor groups and a number of the more representative species.

Relationships of the Groups.—As we recede in time we find the extinct representatives of many of these orders approximating more and more closely to a common generalized type, so that in a large number of early Eocene forms it is often difficult to decide to which group they should be assigned.

The Insectivora are certainly the lowest group of existing placental mammals, and exhibit many signs of affinity with marsupials; they may even be a more generalized group than the latter. From the Insectivora the bats, or Chiroptera, are evidently a specialized lateral offshoot; while the Dermoptera may be another branch from the same stock. As to the Edentata, it is still a matter of uncertainty whether the pangolins

(Pholidota) and the ant-bears (Tubulidentata) are rightly referred to an order typically represented by the sloths, anteaters, and armadillos of South and Central America, or whether the two first-named groups have any close relationship with one another. Much uncertainty prevails with regard to the ancestry of the group as a whole, although some of the earlier South American forms have a comparatively full series of teeth, which are also of a less degenerate type than those of their modern representatives.

An almost equal degree of doubt obtains with regard to the ancestry of that very compact and well-defined group the Rodentia. If, however, the so-called Proglires of the lower Eocene are really ancestral rodents, the order is brought into comparatively close connexion with the early generalized types of clawed, or unguiculate mammals. Whether the extinct Tillodontia are most nearly allied to the Rodentia, the Carnivore or the Ungulata, and whether they are really entitled to constitute an ordinal group by themselves, must remain for the present open questions.

The Carnivora, as represented by the (mainly) Eocene Creodonta, are evidently an ancient and generalized type. As regards the number and form of their permanent teeth, at any rate, creodonts present such a marked similarity to carnivorous marsupials, that it is difficult to believe the two groups are not allied, although the nature of the relationship is not yet understood, and the minute internal structure of the teeth is unlike that of marsupials and similar to that of modern Carnivora. There is the further possibility that creodonts may be directly descended from the carnivorous reptiles; a descent which if proved might introduce some difficulty with regard to the above-mentioned theory as to the arboreal ancestry of mammals generally. Be this as it may, there can be little doubt that the creodonts are related to the Insectivora, which, as stated above, show decided signs of kinship with the marsupials.

A much more interesting relationship of the creodont carnivora has, however, been established on the evidence of recent discoveries in Egypt. From remains of Eocene age in that country Dr E. Fraas, of Stuttgart, has demonstrated the derivation of the whale-like *Zeuglodon* from the creodonts. Dr C. E. Andrews has, moreover, not only brought forward additional evidence in favour of this most remarkable line of descent, but is confident—which Professor Fraas was not—that *Zeuglodon* itself is an ancestral cetacean, and consequently that whales are the highly modified descendants of creodonts. It must be admitted, however, that the links between *Zeuglodon* and typical cetaceans are at present unknown; but it may be hoped that these will be eventually brought to light from the deposits of the Mokattam Range, near Cairo. Whales and dolphins being thus demonstrated to be nothing more than highly modified Carnivora, might almost be included in the same ordinal group.

An analogous statement may be made with regard to the sea-cows, or Sirenia, which appear to be derivates from the great herbivorous order of Ungulata, and might consequently be included in that group, as indeed has been already done in Dr Max Weber's classification. It is with the proboscidean suborder of the Ungulata to which the Sirenia are most nearly related; the nature of this relationship being described by Dr Andrews as follows:—

"In the first place, the occurrence of the most primitive Sirenians with which we are acquainted in the same region as the most generalized proboscidean, *Moeritherium*, is in favour of such a view, and this is further supported by the similarity of the brain-structure and, to some extent, of the pelvis in the earliest-known members of the two groups. Moreover, in the anatomy of the soft-parts of the recent forms there are a number of remarkable points of resemblance. Among the common characters may be noted the possession of: (1) pectoral mammae; (2) abdominal testes; (3) a bifid apex of the heart; (4) bilophodont molars

with a tendency to the formation of an additional lobe from the posterior part of the cingulum. The peculiar mode of displacement of the teeth from behind forwards in some members of both groups may perhaps indicate a relationship, although in the case of the Sirenia the replacement takes place by means of a succession of similar molars, while in the Proboscidea the molars remain the same numerically, but increase greatly in size and number of transverse ridges."

These and certain other facts referred to by the same author point to the conclusion that not only are the Sirenia and the Proboscidea derived from a single ancestral stock, but that the Hyracoidea—and so *Arsinöitherium*—are also derivatives from the same stock, which must necessarily have been Ethiopian.

Of the other suborders of ungulates, the Toxodontia and Litopterna are exclusively South American, and while the former may possibly be related to the Hyracoidea and Barypoda, the latter is perhaps more nearly akin to the Perissodactyla. The Amblypoda, on the other hand, are perhaps not far removed from the ancestral Proboscidea, which depart comparatively little from the generalized ungulate type. The latter is represented by the Eocene Condylarthra, which undoubtedly gave rise to the Perissodactyla and Artiodactyla, and probably to most, if not all, of the other groups. The Condylarthra, in their turn, approximate closely to the ancestral Carnivora, as they also do in some degree to the ancestral Primates. As regards the latter order, although we are at present unacquainted with all the connecting links between the lemurs and the monkeys, there is little doubt that the ancestors of the former represent the stock from which the latter have originated. C. D. Earle, in the *American Naturalist* for 1897, observes that "so far as the palaeontological evidence goes it is decidedly in favour of the view that apes and lemurs are closely related. Beginning with the earliest known lemur, *Anaptomorphus*, this genus shows tendencies towards the

anthropoids, and, when we pass up into the Oligocene of the Old World, *Adapis* is a decidedly mixed type, and probably not far from the common stem-form which gave origin to both suborders of the Primates. In regard to *Tarsius*, it is evidently a type nearly between the lemurs and apes, but with many essential characters belonging to the former group."

Distribution.—For an account of the "realms" and "regions" into which the surface of the globe has been divided by those who have made a special study of the geographical distribution of animals, see ZOOLOGICAL DISTRIBUTION. For the purposes of such zoo-geographical divisions, mammals are much better adapted than birds, owing to their much more limited powers of dispersal; most of them (exclusive of the purely aquatic forms, such as seals, whales, dolphins and sea-cows) being unable to cross anything more than a very narrow arm of the sea. Consequently, the presence of nearly allied groups of mammals in areas now separated by considerable stretches of sea proves that at no very distant date such tracts must have had a land-connexion. In the case of the southern continents the difficulty is, however, to determine whether allied groups of mammals (and other animals) have reached their present isolated habitats by dispersal from the north along widely sundered longitudinal lines, or whether such a distribution implies the former existence of equatorial land-connexions. It may be added that even bats are unable to cross large tracts of sea; and the fact that fruit-bats of the genus *Pteropus* are found in Madagascar and the Seychelles, as well as in India, while they are absent from Africa, is held to be an important link in the chain of evidence demonstrating a former land-connexion between Madagascar and India.

There is another point of view from which mammals are of especial importance in regard to geographical distribution, namely their comparatively late rise and dispersal, or "radiation," as compared with reptiles.

As regards terrestrial mammals (with which alone we are at present concerned), one of the most striking features in their distribution is their practical absence from oceanic islands; the only species found in such

localities being either small forms which might have been carried on floating timber, or such as have been introduced by human agency. This absence of mammalian life in oceanic islands extends even to New Zealand, where the indigenous mammals comprise only two peculiar species of bats, the so-called Maori rat having been introduced by man.

One of the leading features in mammalian distribution is the fact that the Monotremata, or egg-laying mammals, are exclusively confined to Australia and Papua, with the adjacent islands. The marsupials also attain their maximum development in Australia ("Notogaea" of the distributionists), extending, however, as far west as Celebes and the Moluccas, although in these islands they form an insignificant minority among an extensive placental fauna, being represented only by the cuscuses (*Phalanger*), a group unknown in either Papua or Australia. Very different, on the other hand, is the condition of things in Australia and Papua, where marsupials (and monotremes) are the dominant forms of mammalian life, the placentals being represented (apart from bats, which are mainly of an Asiatic type) only by a number of more or less aberrant rodents belonging to the mouse-tribe, and in Australia by the dingo, or native dog, and in New Guinea by a wild pig. The dingo was, however, almost certainly brought from Asia by the ancestors of the modern natives; while the Papuan pig is also in all probability a human introduction, very likely of much later date. The origin of the Australasian fauna is a question pertaining to the article ZOOLOGICAL DISTRIBUTION. The remaining marsupials (namely the families *Didelphyidae* and *Epanorthidae*) are American, and mainly South and Central American at the present day; although during the early part of the Tertiary period representatives of the first-named family ranged all over the northern hemisphere.

The Insectivora (except a few shrews which have entered from the north) are absent from South America, and appear to have been mainly an

Old World group, the only forms which have entered North America being the shrew-mice (*Soricidae*) and moles (*Talpidae*). The occurrence of one aberrant group (*Solenodon*) in the West Indies is, however, noteworthy. The family with the widest distribution is the *Soricidae*, the *Talpidae* being unknown in Africa. The tree-shrews (*Tupaiidae*) are exclusively Asiatic, whereas the jumping-shrews (*Macroscelididae*) are equally characteristic of the African continent. Madagascar is the sole habitat of the tenrecs (*Centetidae*), as is Southern Africa of the golden moles (*Chrysochloridae*). It is, however, important to mention that an extinct South American insectivore, *Necrolestes*, has been referred to the family last mentioned; and even if this reference should not be confirmed in the future, the occurrence of a representative of the order in Patagonia is a fact of considerable importance in distribution.

The Rodentia have a wider geographical range than any other order of terrestrial mammals, being, as already mentioned, represented by numerous members of the mouse-tribe (*Muridae*) even in Australasia. With the remarkable exception of Madagascar, where it is represented by the *Nesomyidae*, that family has thus a cosmopolitan distribution. Very noteworthy is the fact that, with the exception of Madagascar (and of course Australia) the squirrel family (*Sciuridae*) is also found in all parts of the world. Precisely the same may be said of the hares, which, however, become scarce in South America. On the other hand, the scaly-tailed squirrels (*Anomaluridae*), the jumping-hares (*Pedetidae*), and the strand-moles (*Bathyergidae*) are exclusively African; while the sewellels (*Haplodontidae*) and the pocket-gophers (*Geomyidae*) are as characteristically North American, although a few members of the latter have reached Central America. The beavers (*Castoridae*) are restricted to the northern hemisphere, whereas the dormice (*Gliridae*) and the mole-rats (*Spalacidae*) are exclusively Old World forms, the latter only entering the north of Africa, in which continent the former are largely developed. The jerboa group (*Dipodidae*, or *Jaculidae*) is also mainly an

Old World type, although its aberrant representatives the jumping-mice (*Zapus*) have effected an entrance into Arctic North America. Porcupines enjoy a very wide range, being represented throughout the warmer parts of the Old World, with the exception of Madagascar (and of course Australasia), by the *Hystricidae*, and in the New World by the *Erethizontidae*. Of the remaining families of the Simplicidentata, all are southern, the cavies (*Caviidae*), chinchillas (*Chinchillidae*), and degus (*Octodontidae*) being Central and South American, while the *Capromyidae* are common to southern America and Africa, and the *Ctenodactylidae* are exclusively African. The near alliance of all these southern families, and the absence of so many Old World families from Madagascar form two of the most striking features in the distribution of the order. Lastly, among the Duplicidentata, the picas (*Ochotonidae* or *Lagomyidae*) form a group confined to the colder or mountainous regions of the northern hemisphere.

Among the existing land Carnivora (of which no representatives except the introduced dingo are found in Australasia) the cat-tribe (*Felidae*) has now an almost cosmopolitan range, although it only reached South America at a comparatively recent date. Its original home was probably in the northern hemisphere; and it has no representatives in Madagascar. The civet-tribe (*Viverridae*), on the other hand, which is exclusively an Old World group, is abundant in Madagascar, where it is represented by peculiar and aberrant types. The hyenas (*Hyaenidae*), at any rate at the present day, to which consideration is mainly limited, are likewise Old World. The dog-tribe (*Canidae*), on the other hand, are, with the exception of Madagascar, an almost cosmopolitan group. Their place of origin was, however, almost entirely in the northern hemisphere, and not improbably in some part of the Old World, where they gave rise to the bears (*Ursidae*). The latter are abundant throughout the northern hemisphere, and have even succeeded in penetrating into South America, but, with the exception of the Mediterranean zone, have never succeeded

in entering Africa, and are therefore of course unknown in Madagascar. The raccoon group (*Procyonidae*) is mainly American, being represented in the Old World only by the pandas (*Aelurus* and *Aeluropus*), of which the latter apparently exhibits some affinity to the bears. The birthplace of the group was evidently in the northern hemisphere—possibly in east Central Asia. The weasel-tribe (*Mustelidae*) is clearly a northern group, which has, however, succeeded in penetrating into South America and Africa, although it has never reached Madagascar.

The extinct creodonts, especially if they be the direct descendants of the anomodont reptiles, may have originated in Africa, although they are at present known in that continent only from the Fayum district. Elsewhere they occur in South America and throughout a large part of the northern hemisphere, where they appear to have survived in India to the later Oligocene or Miocene.

In the case of the great order, or assemblage, of Ungulata it is necessary to pay somewhat more attention to fossil forms, since a considerable number of groups are either altogether extinct or largely on the wane.

So far as is at present known, the earliest and most primitive group, the Condylarthra, is a northern one, but whether first developed in the eastern or the western hemisphere there is no sufficient evidence. The more or less specialized Litopterna and Toxodontia, as severally typified by the macrauchenia and the toxodon, are, on the other hand, exclusively South American. With the primitive five-toed Amblypoda, as represented by the coryphodon, we again reach a northern group, common to the two hemispheres; but there is not improbably some connexion between this group and the much more specialized Barypoda, as represented by *Arsinöitherium*, of Africa. The Ancylopoda, again, typified by *Chalicotherium*, and characterized by the claw-like character of the

digits, are probably another northern group, common to the eastern and western hemispheres.

Recent discoveries have demonstrated the African origin of the elephants (Proboscidea) and hyraxes (Hyracoidea), the latter group being still indeed mainly African, and in past times also limited to Africa and the Mediterranean countries. As regards the elephants (now restricted to Africa and tropical Asia), there appears to be evidence that the ancestral mastodons, after having developed from African forms probably not very far removed from the Amblypoda, migrated into Asia, where they gave rise to the true elephants. Thence both elephants and mastodons reached North America by the Bering Sea route; while the former, which arrived earlier than the latter, eventually penetrated into South America.

The now waning group of Perissodactyla would appear to have originally been a northern one, as all the three existing families, rhinoceroses (*Rhinocerotidae*), tapirs (*Tapiridae*), and horses (*Equidae*), are well represented in the Tertiaries of both halves of the northern hemisphere. If eastern Central Asia were tentatively given as the centre of radiation of the group, this might perhaps best accord with the nature of the case. Rhinoceroses disappeared comparatively early from the New World, and never reached South America. In Siberia and northern Europe species of an African type survived till a comparatively late epoch, so that the present relegation of the group to tropical Asia and Africa may be regarded as a modern feature in distribution. Horses, now unknown in a wild state in the New World, although still widely spread in the Old, attained a more extensive range in past times, having successfully invaded South America. On the other hand, in common with the rest of the Perissodactyla, they never reached Madagascar. In addition to the occurrence of their fossil remains almost throughout the world, the former wide range of the tapirs is attested by the fact of their living

representatives being confined to such widely sundered areas as Malaysia and tropical America.

The Artiodactyla are the only group of ungulates known to have been represented in Madagascar; but since both these Malagasy forms—namely two hippopotamuses (now extinct) and a river-hog—are capable of swimming, it is most probable that they reached the island by crossing the Mozambique Channel. As regards the deer-family (*Cervidae*), which is unknown in Africa south of the Sahara, it is quite evident that it originated in the northern half of the Old World, whence it reached North America by the Bering Sea route, and eventually travelled into South America. More light is required with regard to the past history of the giraffe-family (*Giraffidae*), which includes the African okapi and the extinct Indian *Sivatherium*, and is unknown in the New World. Possibly, however, its birthplace may prove to be Africa; if so, we shall have a case analogous to that of the African elephant, namely that while giraffes flourished during the Pliocene in Asia (where they may have originated), they survive only in Africa. An African origin has also been suggested for the hollow-horned ruminants (*Bovidae*); and if this were substantiated it would explain the abundance of that family in Africa and the absence from the heart of that continent of the deer-tribe. Some confirmation of this theory is afforded by the fact that whereas we can recognize ancestral deer in the Tertiaries of Europe we cannot point with certainty to the forerunners of the *Bovidae*. Whether its birthplace was in Africa or to the north, it is, however, clear that the hollow-horned ruminants are essentially an Old World group, which only effected an entrance into North America at a comparatively recent date, and never succeeded in reaching South America. So far as it goes, this fact is also in favour of the African ancestry of the group.

The *Antilocapridae* (prongbuck), whose relationships appear to be rather with the *Cervidae* than with the *Bovidae*, are on the other hand

apparently a North American group. The chevrotains (*Tragulidae*), now surviving only in West and Central Africa and tropical Asia, are conversely a purely Old World group.

The camels (*Tylopoda*) certainly originated in the northern hemisphere, but although their birthplace has been confidently claimed for North America, an equal, if not stronger, claim may be made on the part of Central Asia. From the latter area, where wild camels still exist, the group may be assumed to have made its way at an early period into North America; whence, at a much later date, it finally penetrated into South America. In the Old World it seems to have reached the fringe of the African continent, where its wanderings in a wild state were stayed.

The pigs (*Suidae*) and the hippopotamuses (*Hippopotamidae*) are essentially Old World groups, the former of which has alone succeeded in reaching America, where it is represented by the collateral branch of the peccaries (*Dicotylinae*). An African origin would well explain the present distribution of both groups, but further evidence on this point is required before anything decisive can be affirmed, although it is noteworthy that the earliest known pig (*Geniohyus*) is African. The Suinae are at present spread all over the Old World, although the African forms (other than the one from the north) are markedly distinct from those inhabiting Europe and Asia. Hippopotamuses, on the contrary, are now exclusively African, although they were represented in tropical Asia during the Pliocene and over the greater part of Europe at a later epoch.

A brief notice with regard to the distribution of the Primates must suffice, as their past history is too imperfectly known to admit of generalizations being drawn. The main facts at the present day are, firstly, the restriction of the Prosimiae, or lemurs, to the warmer parts of the Old World, and their special abundance in Madagascar (where other Primates are wanting); and, secondly, the wide structural distinction between the monkeys of tropical America (Platyrrhina), and the Old World monkeys

and apes, or Catarrhina. It is, however, noteworthy that extinct lemurs occur in the Tertiary deposits of both halves of the northern hemisphere —a fact which has induced Dr J. L. Wortman to suggest a polar origin for the entire group—a view we are not yet prepared to endorse. For the distribution of the various families and genera the reader may be referred to the article PRIMATES; and it will suffice to mention here that while chimpanzees and baboons are now restricted to Africa and (in the case of the latter group) Arabia, they formerly occurred in India.

As regards aquatic mammals, the greater number of the Cetacea, or whales and dolphins, have, as might be expected, a very wide distribution in the ocean. A few, on the other hand, have a very restricted range, the Greenland right whale (*Balaena mysticetus*) being, for instance, limited to the zone of the northern circumpolar ice, while no corresponding species occurs in the southern hemisphere. In this case, not only temperature, but also the peculiar mode of feeding, may be the cause. The narwhal and the beluga have a very similar distribution, though the latter occasionally ranges farther south. The bottle-noses (*Hyperöodon*) are restricted to the North Atlantic, never entering, so far as known, the tropical seas. Other species are exclusively tropical or austral in their range. The pigmy whale (*Neobalaena marginata*), for instance, has only been met with in the seas round Australia, New Zealand and South America, while a beaked whale (*Berardius arnouxi*) appears to be confined to the New Zealand seas.

The Cetacea, however, are by no means limited to the ocean, or even to salt water, some entering large rivers for considerable distances, and others being exclusively fluviatile. The susu (*Platanista*) is, for instance, extensively distributed throughout nearly the whole of the river systems of the Ganges, Brahmaputra and Indus, ascending as high as there is water enough to swim in, but apparently never passing out to sea. The individuals inhabiting the Indus and the Ganges must therefore have been

for long ages isolated without developing any distinctive anatomical characters, those by which *P. indi* was separated from *P. gangetica* having been shown to be of no constant value. *Orcella fluminalis*, again, appears to be limited to the Irrawaddy; and at least two distinct species of dolphin, belonging to different genera, are found in the Amazon. It is remarkable that none of the great lakes or inland seas of the world is inhabited by cetaceans.

The great difference in the manner of life of the sea-cows, or Sirenia, as compared with that of the Cetacea, causes a corresponding difference in their geographical distribution. Slow in their movements, and feeding on vegetable substances, they are confined to the neighbourhood of rivers, estuaries or coasts, although there is a possibility of accidental transport by currents across considerable distances. Of the three genera existing within historic times, one (*Manatus*) is exclusively confined to the shores of the tropical Atlantic and the rivers entering into it, individuals scarcely specifically distinguishable being found both on the American and the African. The dugong (*Halicore*) is distributed in different colonies, at present isolated, throughout the Indian Ocean from Arabia to North Australia; while the *Rhytina* or northern sea-cow was, for some time before its extinction, limited to a single island in the extreme north of the Pacific Ocean.

The seals (*Pinnipedia*) although capable of traversing long reaches of ocean, are less truly aquatic than the last two groups, always resorting to the land or to ice-floes for breeding. The geographical range of each species is generally more or less restricted, usually according to climate, as they are mostly inhabitants either of the Arctic or Antarctic seas and adjacent temperate regions, few being found within the tropics. For this reason the northern and the southern species are for the most part quite distinct. In fact, the only known exception is the case of a colony of elephant-seals (*Macrorhinus leoninus*), whose general range is in the

southern hemisphere, inhabiting the coast of California. In this case a different specific name has been given to the northern form, but the characters by which it is distinguished are of little importance, and probably, except for the abnormal geographical distribution, would never have been discovered. The most remarkable circumstance connected with the distribution of seals is the presence of members of the order in the three isolated great lakes or inland seas of Central Asia—the Caspian, Aral and Baikal—which, notwithstanding their long isolation, have varied but slightly from species now inhabiting the Polar Ocean.

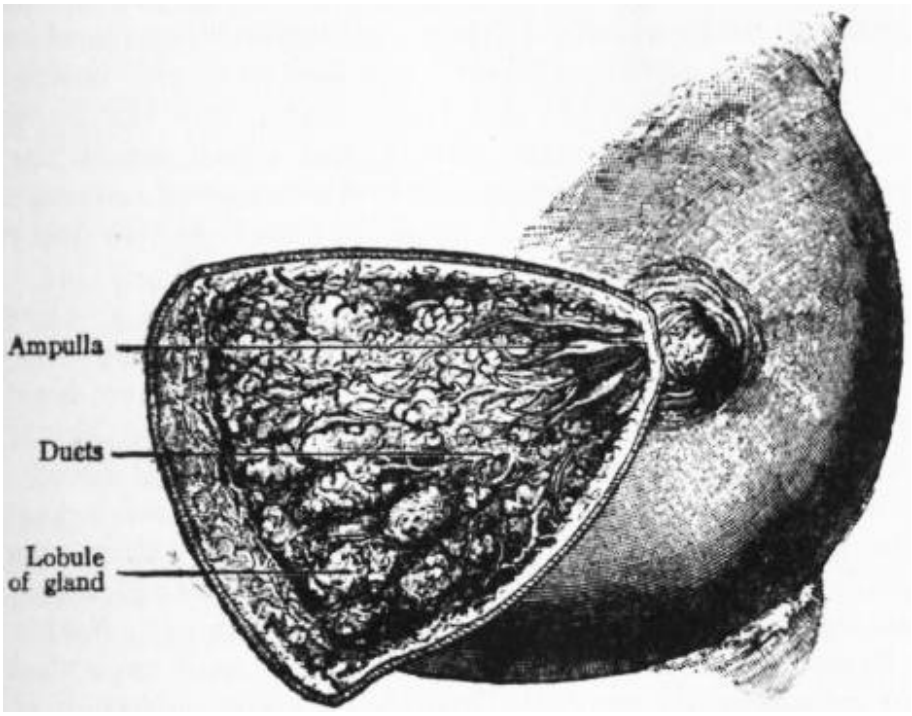
AUTHORITIES.—The above article is partly based on that of Sir W. H. Flower in the 9th edition of this work. The literature connected with mammals is so extensive that all that can be attempted here is to refer the reader to a few textbooks, with the aid of which, combined with that of the annual volumes of the *Zoological Record*, he may obtain such information on the subject as he may require: F. E. Beddard, "Mammals," *The Cambridge Natural History*, vol. x. (1902); W. H. Flower and R. Lydekker, *The Study of Mammals* (London, 1891); Max Weber, *Die Säugethiere* (Jena, 1904); W. T. Blanford, *The Fauna of British India—Mammalia* (1888-1891); D. G. Elliot, *Synopsis of the Mammals of North America* (Chicago, 1901) and *The Mammals of Middle America and the West Indies* (Chicago, 1904); W. L. Sclater, *The Fauna of South Africa—Mammals* (Cape Town, 1901-1902); W. K. Parker, *Mammalian Descent* (London, 1885); E. Trouessart, *Catalogus mammalium, tam viventium quam fossilium* (Paris, 1898-1899); and supplement, 1904-1905; T. S. Palmer, *Index generum mammalium* (Washington, 1904); W. L. and P. L. Sclater, *The Geography of Mammals* (London, 1899); R. Lydekker, *A Geographical History of Mammals* (Cambridge, 1896). (W. H. F.; R. L.)

MAMMARY GLAND (Lat. *mamma*), or female breast, the organ by means of which the young are suckled, and the possession of which, in some region of the trunk, entitles the animal bearing it to a place in the order of Mammalia.

Anatomy.—In the human female the gland extends vertically from the second to the sixth rib, and transversely from the edge of the sternum to the mid axillary line; it is embedded in the fat superficial to the pectoralis major muscle, and a process which extends toward the arm-pit is sometimes called the axillary tail. A little below the centre of the glandular swelling is the *nipple*, surrounding which is a pigmented circular patch called the areola; this is studded with slight nodules, which are the openings of areolar glands secreting an oily fluid to protect the skin during suckling. During the second or third month of pregnancy the areola becomes more or less deeply pigmented, but this to a large extent passes off after lactation ceases. In structure the gland consists of some fifteen to twenty lobules, each of which has a *lactiferous duct* opening at the summit of the nipple, and branching in the substance of the gland to form secondary lobules, the walls of which are lined by cubical epithelium in which the milk is secreted. These secondary lobules project into the surrounding fat, so that it is difficult to dissect out the gland cleanly. Before opening at the nipple each lactiferous duct has a fusiform dilatation called the *ampulla*.

After the child-bearing period of life the breasts atrophy and tend to become pendulous, while in some African races they are pendulous

throughout life. Variations in the mammary glands are common; often the left breast is larger than the right, and in those rare cases in which one breast is suppressed it is usually the right, though suppression of the breast does not necessarily include absence of the nipple.



(From A. F. Dixon, Cunningham's *Text Book of Anatomy*.)

FIG. 1.—Dissection of the Mammary Gland.

Supernumerary nipples and glands are not uncommon, and, when they occur, are usually situated in the mammary line which extends from the anterior axillary fold to the spine of the pubis; hence, when an extra nipple appears above the normal one, it is external to it, but, when below, it is nearer the middle line. The condition of extra breasts is known as *polymasty*, that of extra nipples as *polythely*, and it is interesting to notice that the latter is commoner in males than in females. O. Ammon (quoted by Wiedersheim) records the case of a German soldier who had four nipples on each side. These nipples in the human subject are seldom

found below the costal margin. In normal males the breast structure is present, but rudimentary, though it is not very rare to find instances of boys about puberty in whom a small amount of milk is secreted, and one case at least is recorded of a man who suckled a child. A functional condition of the mammary glands in men is known as *gynaekomasty*. (For further details see *The Structure of Man*, by R. Wiedersheim, translated by H. and M. Bernard, and edited by G. B. Howes, London, 1895.)

Embryology.—There is every probability that the mammary glands are modified and hypertrophied sebaceous glands, and transitional stages are seen in the areolar glands, which sometimes secrete milk. At an early stage of foetal life a raised patch of ectoderm is seen, which later on becomes a saucer-like depression; from the bottom of this fifteen or twenty solid processes of cells, each presumably representing a sebaceous gland, grow into the mesoderm which forms the connective-tissue stroma of the mamma. Later on these processes branch. The last stage is that the centre of the *mammary pit* or saucer-like depression once more grows up to form the nipple, and at birth the processes become tubular, thus forming lactiferous ducts. The glands grow little until the age of puberty, but their full development is not reached until the birth of the first child.

Comparative Anatomy.—In the lower Mammals the mammary line, already mentioned, appears in the embryo as a ridge, and in those which have many young at a birth patches of this develop in the thoracic and abdominal regions to form the mammae, while the intervening parts of the ridge disappear. The number of mammae is not constant in animals of the same species; as an instance of this it will be found that in the dog the number of nipples varies from seven to ten, though animals with many nipples are more liable to variation than those with few. When only a few young are produced at a time the mammae are few, and it seems to

depend on the convenience of suckling in which part of the mammary line the glands are developed. In the pouched Mammals (Monotremes and Marsupials) inguinal mammae are found, and so they are in most Ungulates as well as in the Cetacea. In the elephants, Sirenia, Chiroptera and most of the Primates, on the other hand, they are confined to the pectoral region, and this is also the case in some Rodents, *e.g.* the jumping hare (*Pedetes caffer*). In the monotremes the mammary pit remains throughout life, and the milk is conducted along the hairs to the young, but in other Mammals nipples are formed in one of two ways. One is that already described in Man, which is common to the Marsupials and Primates, while in the other the margin or *vallum* of the mammary pit grows up, and so forms a nipple with a very deep pit, into the bottom of which the lactiferous ducts open. The latter is regarded as the primary arrangement. In the monotremes the mammae are looked upon, not as modified sebaceous glands, as in other Mammals, but as altered sweat glands. It is further of interest to notice that in these primitive Mammals the glands are equally developed in both sexes, and it is thought that among the bats the male often assists in suckling the young (see G. Dobson, *Brit. Museum Cat. of the Chiroptera*, London, 1878). These facts, together with the occasional occurrence of gynaekomasty in man, make it probable that the ancestral Mammal was an animal in which both sexes helped in the process of lactation.

For further details and literature up to 1906 see *Comparative Anatomy of Vertebrates*, by R. Wiedersheim, adapted by W. N. Parker (1907), and Bronn's *Classen und Ordnungen des Thierreichs*.

(F. G. P.)

Diseases of the Mammary Gland.—Inflammation of the breast (*mastitis*) is apt to occur in a woman who is suckling, and is due to the presence of septic micro-organisms, which, as a rule, have found their way into the milk-ducts, the lymphatics or the veins, through a crack, or

other wound, in a nipple which has been made sore by the infant's vigorous attempts to obtain food. Especially is this septic inflammation apt to occur if the nipple is depressed, or so badly formed that the infant has difficulty in feeding from it. The inflamed breast is enlarged, tender and painful, and the skin over it is hot, and perhaps too reddened. The woman feels ill and feverish, and she may shiver, or have a definite rigor —which suggests that the inflammation is running on to the formation of an abscess. The abscess may be superficial to, or beneath, the breast, but it is usually within the breast itself. The infant should at once be weaned, the milk-tension being relieved by the breast-pump. Fomentations should be applied under waterproof jaconette, and the breast should be evenly supported by a bandage or by the corsets. Belladonna and glycerine should be smeared over the breast, with the view of checking the secretion of milk, as well as of easing pain. But before this is done six or eight leeches may be applied. On the first indication that matter is collecting, an incision should be made, for if the matter is allowed to remain locked up in the breast tissue the abscess will rapidly increase in size, and the whole of the breast may become infected and destroyed. Supposing that, in making the incision, no pus is discovered, the relief to the vascular tension thus afforded will be nevertheless highly beneficial. The operation had better be done under a general anaesthetic, so that the surgeon can introduce a probe, or his finger, into the wound, breaking down the partitions which are likely to exist between separate abscesses, and thus enable them to be drained through the one opening. As the discharge begins to cease, the tenderness subsides, and gentle massage, or firm strapping of the breast, will prove useful. The general treatment will consist in the administration of an aperient, and, the tongue being clean, in prescribing such drugs as quinine, strychnia and iron. The diet should be liberal, but not carried to such excess that the power of digestion and absorption is overtaxed. During the early acute stage of the disease small

doses of morphia may be necessary. When the tongue has cleaned, a little wine may be given with advantage.

Chronic Eczema around the nipple of a woman late in life, with, perhaps, localized ulceration, is known as *Paget's Disease*. The importance of it is that cancerous infiltration is apt to pass from it along the milk-ducts and to involve the breast in malignant disease. Hence, when eczema about the nipple refuses to clear up under the influence of soothing treatment, it is well to insist on the removal of the entire breast. Sometimes this eczema is malignant from the beginning, being associated with the active prolifization of the epithelial cells of the milk-ducts, and with their escape into the surrounding tissues. The nipple is retracted in most of these cases, which, however, are not often met with.

Chronic Mastitis is of frequent occurrence in women who are past middle age. The part of the breast involved is enlarged, hard, and more or less tender and painful. It is sometimes impossible clinically to distinguish this disease from cancer. True, the tumour is not so definite or so hard as a cancer, nor is it attached to the skin, nor to the muscles of the chest wall, and if there are any glands secondarily enlarged in the arm-pit they are not so hard as they may be in cancer. But all these are questions of degree. It is, of course, highly inadvisable to leave it to time to clear up the diagnosis, for a chronic mastitis, innocent at first, may eventually become cancerous. If in any case the difficulty of distinguishing a chronic mastitis from a malignant tumour of the breast is insuperable, the safest course is to remove the breast and have it examined by the microscope. The suggestion, sometimes made, as to the preliminary removal of a small piece of the tumour for examination is not to be recommended.

A simple glandular tumour, *fibro-adenoma*, is apt to be found in the breasts of youngish women, who may possibly give an account of some blow or other injury; there may, however, be no history of injury. The tumour is smooth, rounded or oval, and lies loose in the midst of the

breast; as a rule it is not tender. It is not associated with enlarged glands in the arm-pit. The tumour had best be removed, though there is no urgency about the operation, as the growth is absolutely innocent. There is, however, no telling as to what course an innocent tumour of the breast may take as middle age comes on.

Cysts of the Breast.—A *galactocele* is a tumour due to the locking up of milk in a greatly dilated duct. Other forms of cystic disease may be due to serous or hydatid fluid, or to thin pus, being surrounded by fibrous walls. Such cysts are best treated by free incision, and by passing a gauze dressing into their depths. If the tissue is occupied by many cysts, the whole breast had better be removed.

Cancer of the Breast may be met with in men as well as in women; in men, however, it is very rare. It is commonest in women between the ages of forty and fifty. It is sometimes met with in women of twenty; and the younger the individual the more malignant is the disease. Married life seems to have no effect as regards the incidence of the disease, but it often happens that a breast which gave trouble during the period of suckling becomes later the subject of cancer; in other cases there is a clear history of the attack having followed an injury. It is, thus, as if inflammatory changes in the breast were the direct cause of a later cancerous invasion. Though it is impossible to affirm that heredity has a great influence in the incidence of cancer, it is, nevertheless, remarkable that the members of certain families are unusually prone to the disease.

The chief feature of a cancerous tumour of the breast is its great hardness. The technical name for the growth is *scirrhus* (Gr. σκίρος, or σκίῤῥος, any hard coat or covering, *stucco*), from its stony hardness. The tumour consists of a dense framework of fibrous tissue, with groups of cancer-cells in the spaces. The malignancy of the disease depends upon the cells, not upon the fibrous tissue. In young subjects the cells predominate, but in old ones the contraction of the fibrous tissue

throughout the breast compresses and destroys the cells, and this sometimes to such an extent that there is at last nothing left at the site but contracted fibrous tissue, all trace of malignancy having disappeared. This variety of the disease is found in old people, and is called *atrophic cancer*.

The cells of a cancerous breast are apt to be carried by the lymphatics to the lymphatic glands in the arm-pit, and by the bloodstream to the spinal column and to other parts of the skeleton, and sometimes to the liver, which thus becomes large and hard, or to the other breast.

As the fibrous tissue around the tumour becomes invaded by the new growth it undergoes contraction (much as a string becomes shorter when it is wetted), and as this shortening of the fibrous bands increases the nipple may be retracted, and the breast may be closely bound down to the chest-wall; and, further, the skin overlying the tumour may be drawn in towards the tumour so as to form a conspicuous dimple. Later, the nutrition of this patch of skin may be so interfered with that it mortifies or breaks down, and thus a cancerous ulcer is produced. This ulcer slowly spreads, and its floor is covered with a discharge in which septic micro-organisms undergo cultivation; in this way the ulcer becomes highly offensive. By the use of antiseptic lotions and a frequent change of dressings, however, all unpleasant smell can be checked or prevented. As the ulcer extends it is apt to implicate large blood-vessels, so that serious, and sometimes alarming, haemorrhages take place. And if the breast had previously been in pain, the bleeding is likely to give great relief. But repeated haemorrhages bring on increasing exhaustion, and thus materially hasten the end.

There is at present only one trustworthy treatment for cancer, and that is its free removal by operation. The entire breast and the nipple must be sacrificed. At the present day the operation itself is not a “dreadful” one. To be successful it must be very thorough, and it must be done *early*. The

patient, being under an anaesthetic, feels nothing, and the subsequent dressings of the wound are attended with scarcely any pain. There need be but a couple of days of confinement to bed, and when the wound has soundly healed the patient may be encouraged to use her arm. Should there be recurrence of cancerous nodules in or about the wound, their removal should be promptly and widely effected. The writer has records of one case in which between the first operation and the last report there was a space of over twenty-nine years, and another of fifteen years. Each of these patients had one extensive operation, and four or five smaller operations for dealing with recurrences. Each of them, however, might be considered unlikely subjects for further return.

For a *superficial cancer* the X-rays may be of service, but many applications of the rays are likely to be needed, and the case may possibly refuse to yield to their influence, and, after loss of valuable time, the disease may have eventually to be removed by the knife. The great advantage which the treatment by the knife offers over every other method is that the growth can be cleanly, efficiently and promptly removed, and, with it, all the affected lymph-spaces, and the lymphatic glands which are secondarily implicated.

As regards the value of radium in the treatment of cancer of the breast, the high expectations which were somewhat widely associated with this newly-found element early in 1909 must be said to have been unjustified by any precise results. Injections of radium salts have been made into the substance of a cancer, and tubes of aluminium containing the salt have been introduced into the growth, but no deep cancer has thereby been cured. Radium has also been exposed again and again on the surface of the affected breast, but similarly with no great result. Unfortunately, whilst one is experimenting in the treatment of an operable cancer, the epithelial cells of the growth may be making their way towards distant parts, where no rays or emanations could possibly reach them. Whatever

may be the future of radium as a therapeutic agent in the treatment of cancer of the breast, it is certain that, on the facts as known at the beginning of 1910, the only safe course is to remove the breast by direct operation, together with the associated lymph-spaces and lymphatic glands. And if this is done promptly and thoroughly cancer of the breast will come more and more into the class of curable diseases. (E. O.*)

MAMMEE APPLE, South American or St Domingo Apricot, the fruit of *Mammea americana* (natural order Clusiaceae), a large tree with opposite leathery gland-dotted leaves, white, sweet-scented, short-stalked, solitary or clustered axillary flowers and yellow fruit 3 to 6 in. in diameter. The bitter rind encloses a sweet aromatic flesh, which is eaten raw or steeped in wine or with sugar, and is also used for preserves. There are one to four large rough seeds, which are bitter and resinous, and used as anthelmintics. An aromatic liqueur distilled from the flowers is known as *eau de créole* in the West Indies, and the acrid resinous gum is used to destroy the chigoes which attack the naked feet of the negroes. The wood is durable and well adapted for building purposes; it is beautifully grained and used for fancy work.

MAMMON, a word of Aramaic origin meaning "riches." The etymology is doubtful; connexions with a word meaning "entrusted," or with the Hebrew *matmon*, treasure, have been suggested. "Mammon," Gr. μαμωνᾶς (see Professor Eb. Nestle in *Ency. Bib. s.v.*), occurs in the Sermon on the Mount (Matt. vi. 24) and the parable of the Unjust Steward (Luke xvi. 9-13). The Authorized Version keeps the Syriac word. Wycliffe uses "richessis." The *New English Dictionary* quotes *Piers Plowman* as containing the earliest personification of the name. Nicholaus de Lyra (commenting on the passage in Luke) says that *Mammon est nomen daemonis*. There is no trace, however, of any Syriac god of such a name, and the common identification of the name with a god of covetousness or avarice is chiefly due to Milton (*Paradise Lost*, i. 678).

MAMMOTH (O. Russ. *mammot*, mod. *mamant*; the Tatar word *mama*, earth, from which it is supposed to be derived, is not known to exist), a name given to an extinct elephant, *Elephas primigenius* of Blumenbach. Probably no extinct animal has left such abundant evidence of its former existence; immense numbers of bones, teeth, and more or less entire carcases, or "mummies," as they may be called, having been discovered, with the flesh, skin and hair *in situ*, in the frozen soil of the tundra of northern Siberia.

The general characteristics of the order PROBOSCIDEA, to which the mammoth belongs, are given under that heading. The mammoth pertains to the most highly specialized section of the group of elephants, which also contains the modern Asiatic species. Of the whole group it is in many

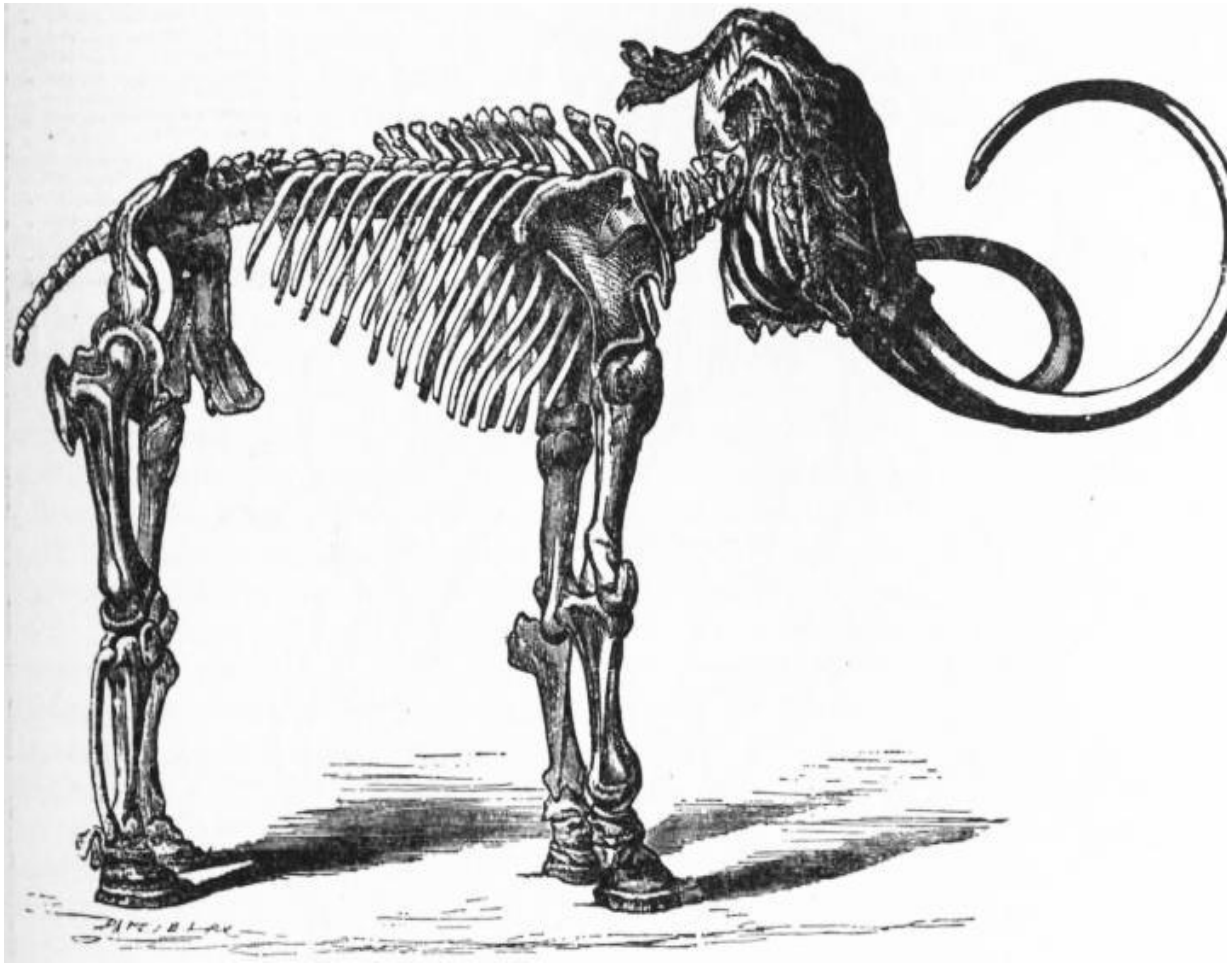
respects, as in the size and form of the tusks and the characters of the molar teeth, the farthest removed from the mastodon type, while its nearest surviving relative, the Asiatic elephant (*E. maximus*), has retained the slightly more generalized characters of the mammoth's contemporaries of more southern climes, *E. columbi* of America and *E. armeniacus* of the Old World. The tusks, or upper incisor teeth, which were probably smaller in the female, in the adult males attained the length of from 9 to 10 ft. measured along the outer curve. Upon leaving the head they were directed at first downwards, and outwards, then upwards and finally inwards at the tips, and generally with a tendency to a spiral form not seen in other elephants.

It is chiefly by the characters of the molar teeth that the various extinct modifications of the elephant type are distinguished. Those of the mammoth (fig. 2) differ from the corresponding organs of allied species in great breadth of the crown as compared with the length, the narrowness and crowding or close approximation of the ridges, the thinness of the enamel, and its straightness, parallelism and absence of "crimping," as seen on the worn surface or in a horizontal section of the tooth. The molars, as in other elephants, are six in number on each side above and below, succeeding each other from before backwards. Of these Dr Falconer gave the prevailing "ridge-formula" (or number of complete ridges in each tooth) as 4, 8, 12, 12, 16, 24, as in *E. maximus*. Dr Leith-Adams, working from more abundant materials, has shown that the number of ridges of each tooth, especially those at the posterior end of the series, is subject to individual variation, ranging in each tooth of the series within the following limits: 3 to 4, 6 to 9, 9 to 12, 9 to 15, 14 to 16, 18 to 27—excluding the small plates, called "talons," at each end. Besides these variations in the number of ridges or plates of which each tooth is composed, the thickness of the enamel varies so much as to have given rise to a distinction between a "thick-plated" and a "thin-plated" variety—the latter being most prevalent among specimens from the Arctic regions. From the specimens with thick enamel plates the

transition to the other species mentioned above, including *E. maximus*, is almost imperceptible.

The bones of the skeleton generally more resemble those of the Indian elephant than of any other species, but the skull differs in the narrower summit, narrower temporal fossae, and more prolonged incisive sheaths, supporting the roots of the enormous tusks. Among the external characters by which the mammoth was distinguished from either of the existing species of elephant was the dense clothing, not only of long, coarse outer hair, but also of close under woolly hair of a reddish-brown colour, evidently in adaptation to the cold climate it inhabited. This character is represented in rude but graphic drawings of prehistoric age found in caverns in the south of France. It should be added that young Asiatic elephants often show considerable traces of the woolly coat of the mammoth. The average height does not appear to have exceeded that of either of the existing species of elephant.

The geographical range of the mammoth was very extensive. There is scarcely a county in England in which its remains have not been found in alluvial gravel or in caverns, and numbers of its teeth are dredged in the North Sea. In Scotland and Ireland its remains are less abundant, and in Scandinavia and Finland they appear to be unknown; but they have been found in vast numbers at various localities throughout the greater part of central Europe (as far south as Santander and Rome), northern Asia, and the northern part of the American continent.

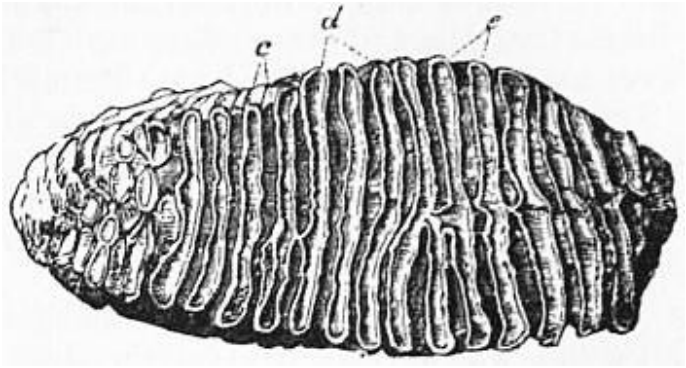


(From Tilesius.)

FIG. 1.—Skeleton of Mammoth (*Elephas primigenius*), with portions of the skin.

The mammoth belongs to the post-Tertiary or Pleistocene epoch and was contemporaneous with man. There is evidence to show that it existed in Britain before, during and after the glacial period. It is in northern Siberia that its remains have been found in the greatest abundance and in exceptional preservation. For a long period there has been from that region an export of mammoth-ivory, fit for commercial purposes, to China and to Europe. In the middle of the 10th century trade was carried on at Khiva in fossil ivory. Middendorff estimated the number of tusks which have yearly come into the market during the last two centuries at at least a hundred pairs, but Nordenskiöld considers this estimate too low. Tusks are found along the

whole shore-line between the mouth of the Obi and Bering Strait, and the farther north the more numerous they become, the islands of New Siberia being one of the favourite collecting localities. The remains are found not only round the mouths of the great rivers, but embedded in the frozen soil in such circumstances as to indicate that the animals lived not far from the localities in which they are found; and they are exposed either by the melting of the ice in warm summers or the washing away of the sea-cliffs or river-banks. In this way the bodies of more or less nearly perfect animals, often standing in the erect position, with the soft parts and hairy covering entire, have been brought to light.



(From Owen.)

FIG. 2.—Grinding surface of Upper Molar Tooth of the Mammoth (*Elephas primigenius*). *c*, cement; *d*, dentine; *e*, enamel.

For geographical distribution and anatomical characters see Falconer's *Paleontological Memoirs*, vol. ii (1868); B. Dawkins, "*Elephas Primigenius*, its Range in Space and Time," *Quart. Journ. Geol. Soc.*, xxxv. 138 (1879); and A. Leith Adams, "Monograph of British Fossil Elephants," part ii., *Palaeontographical Society* (1879).

(W. H. F.; R. L.*)

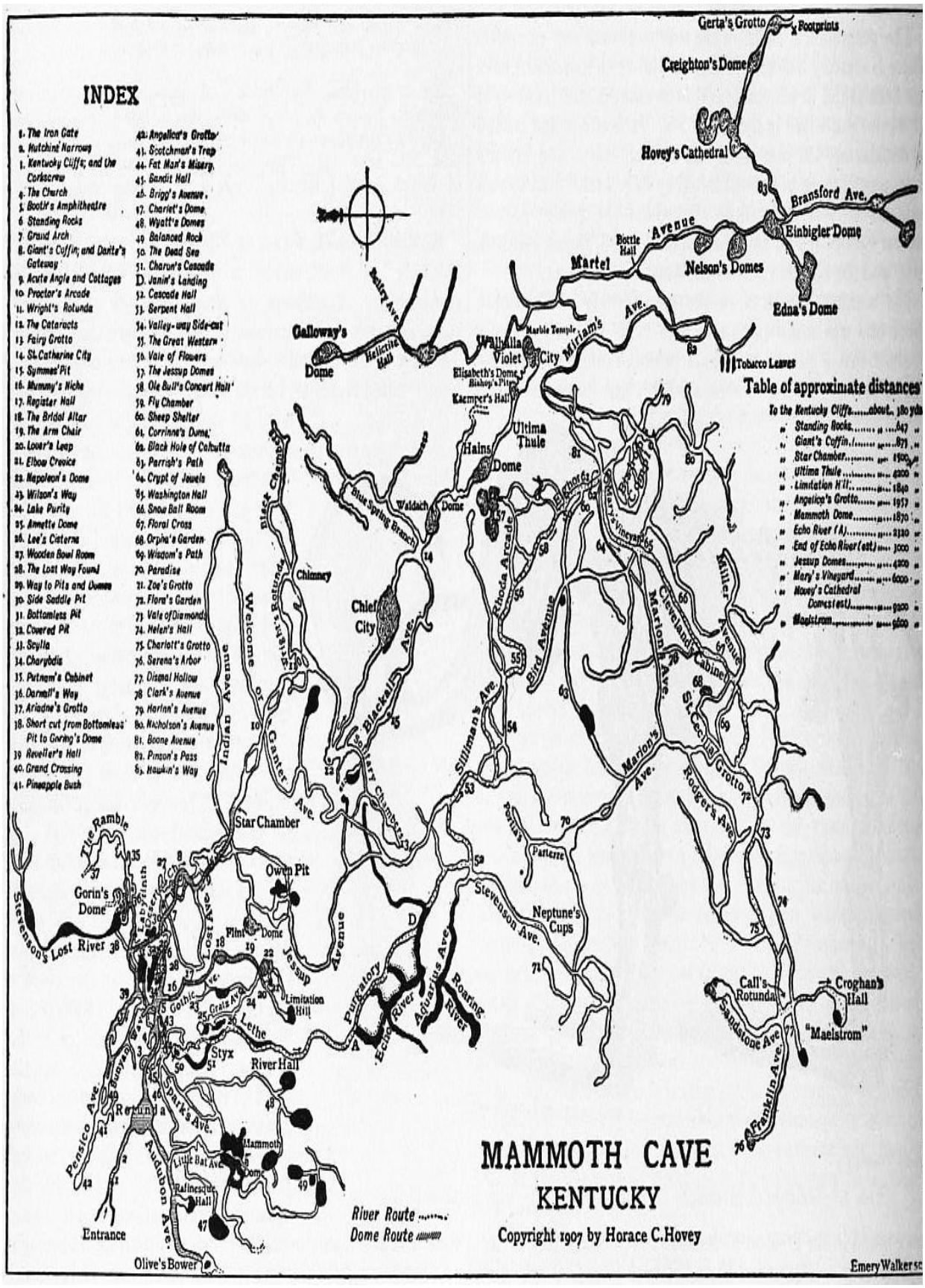
MAMMOTH CAVE, a cave in Edmondson county, Kentucky, U.S.A., 37° 14′ N. lat. and 86° 12′ W. long., by rail 85 m. S.S.W. of Louisville. Steamboats run from the mouth of the Green river, near Evansville, Indiana, to the Mammoth Cave landing. The cave is usually said to have been discovered, in 1809, by a hunter named Hutchins; but the county records, as early as 1797, fixed its entrance as the landmark for a piece of real estate. Its mouth is in a forest ravine, 194 ft. above Green river and 600 ft. above the sea. This aperture is not the original mouth, the latter being a chasm a quarter of a mile north of it, and leading into what is known as Dixon's cave. The two portions are not now connected, though persons in one can make themselves heard by those in the other.

The cavernous limestone of Kentucky covers an area of 8000 sq. m., is massive and homogeneous, and belongs to the Subcarboniferous period. It shows few traces of dynamic disturbance, but has been carved, mainly by erosion since the Miocene epoch, into many caverns, of which the Mammoth Cave is the largest.

The natural arch that admits one to Mammoth Cave has a span of 70 ft., and from a ledge above it a cascade leaps 59 ft. to the rocks below, where it disappears. A flight of stone steps leads the way down to a narrow passage, through which the air rushes with violence, outward in summer and inward in winter. The temperature of the cave is uniformly 54° F. throughout the year, and the atmosphere is both chemically and optically of singular purity. While the lower levels are moist from the large pools and rivers that have secret

connexion with Green river, the upper galleries are extremely dry. These conditions led at one time to the erection of thirteen cottages at a point about 1 m. underground, for the use of invalids, especially consumptives. The experiment failed, and only two cottages now remain as curiosities.

The Main Cave, from 40 to 300 ft. wide and from 35 to 125 ft. high, has several vast rooms, *e.g.* the Rotunda, where are the ruins of the old saltpetre works; the Star Chamber, where the protrusion of white crystals through a coating of the black oxide of manganese creates an optical illusion of great beauty; the Chief City, where an area of 2 acres is covered by a vault 125 ft. high, and the floor is strewn with rocky fragments, among which are found numerous half-burnt torches made of canes, and other signs of prehistoric occupancy. Two skeletons were exhumed near the Rotunda; but few other bones of any description have been found. The so-called Mammoth Cave "mummies" (*i.e.* bodies kept by being inhumed in nitrous earth), with accompanying utensils, ornaments, braided sandals and other relics, were found in Short and Salt Caves near by, and removed to Mammoth Cave for exhibition. The Main Cave, which abruptly ends 4 m. from the entrance, is joined by winding passages, with spacious galleries on different levels; and, although the diameter of the area of the whole cavern is less than 10 m., the combined length of all accessible avenues is supposed to be about 150 m.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Franklin Ave.
Gothic
Grais Ave.
Lethe
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River Hall
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Table of approximate distances
To the Kentucky Cliffs.....about 180 yds
" Standing Rocks..... " ....847 "
" Giant's Coffin..... " ....871 "
" Star Chamber..... " ....1900 "
" Ultima Thule..... " ....2300 "
" Limitation Hill..... " ....1840 "
" Angelica's Grotto..... " ....1957 "
" Mammoth Dome..... " ....1870 "
" Echo River (A)..... " ....2320 "
" End of Echo River (est.) " ....3000 "
" Jessup Domes..... " ....4300 "
" Mary's Vineyard..... " ....6000 "
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" Maelstrom..... " ....9600 "
River Route .....
Dome Route .....
MAMMOTH CAVE
KENTUCKY
Copyright 1907 by Horace C. Hovey
Emery Walker sc

The chief points of interest are arranged along two lines of exploration, besides which there are certain side excursions. The “short route” requires about four hours, and the “long route” nine. Audubon’s Avenue, the one nearest the entrance, is occupied in winter by myriads of bats, that hang from the walls in clusters like swarms of bees. The Gothic Avenue contains numerous large stalactites and stalagmites, and an interesting place called the Chapel, and ends in a double dome and cascade. Among the most surprising features of cave scenery are the vertical shafts that pierce through all levels, from the uppermost galleries, or even from the sink-holes, down to the lowest floor. These are styled pits or domes, according to the position occupied by the observer. A crevice behind a block of stone, 40 ft. long by 20 ft. wide, called the Giant’s Coffin, admits the explorer to a place where six pits, varying in depth from 65 ft. to 200 ft., exist in an area of 600 yds. This includes Gorin’s Dome, which is viewed from a point midway in its side, and also from its top, and was formerly regarded as the finest room in the cavern. Others admire more the Mammoth Dome, at the termination of Spark’s Avenue, where a cataract falls from a height of 150 ft. amid walls wonderfully draped with stalactitic tapestry. The Egyptian Temple, which is a continuation of the Mammoth Dome, contains six massive columns, two of them quite perfect and 80 ft. high and 25 ft. in diameter. The combined length of these contiguous chambers is 400 ft. By a crevice above they are connected with an arm of Audubon’s Avenue. Lucy’s Dome, one of the group of Jessup Domes, is supposed to be the loftiest of all these vertical shafts. A pit called the “Maelstrom,” in Croghan’s Hall, is the spot most remote from the mouth of the cave. There are some fine stalactites near this pit, and others in the Fairy Grotto and in Pensico Avenue; but, considering the magnitude of Mammoth Cave, its poverty of stalactitic ornamentation is remarkable. The wealth of crystals is, however, surprising, and these are of endless variety and fantastic beauty.

Cleveland's Cabinet and Marion's Avenue, each a mile long, are adorned by myriads of gypsum rosettes and curiously twisted crystals, called "oulopholites." These cave flowers are unfolded by pressure, as if a sheaf were forced through a tight binding, or the crystal fibres curl outward from the centre of the group. Thus spotless arches of 50 ft. span are embellished by floral clusters and garlands, hiding nearly every foot of the grey limestone. The botryoidal formations hanging by thousands in Mary's Vineyard resemble mimic clusters of grapes, as the oulopholites resemble roses. Again, there are chambers with drifts of snowy crystals of the sulphate of magnesia, the ceilings so thickly covered with their efflorescence that a loud concussion will cause them to fall like flakes of snow.

Many small rooms and tortuous paths, where nothing of special interest can be found, are avoided as much as possible on the regular routes; but certain disagreeable experiences are inevitable. There is peril also in the vicinity of the deep pits. The one known as the Bottomless Pit was for many years a barrier to all further exploration, but it is now crossed by a wooden bridge. Long before the shaft had been cut as deep as now the water flowed away by a channel gradually contracting to a serpentine way, so extremely narrow as to be called the Fat Man's Misery. The walls, only 18 in. apart, change direction eight times in 105 yds., while the distance from the sandy path to the ledge overhead is but 5 ft. The rocky sides are finely marked with waves and ripples, as if running water had suddenly been petrified. This winding way conducts one to River Hall, beyond which lie the crystalline gardens that have been described. It used to be said that, if this narrow passage were blocked up, escape would be impossible; but an intricate web of fissures, called the Corkscrew, has been discovered, by means of which a good climber, ascending only a few hundred feet, lands 1000 yds. from the mouth of the cave, and cuts off one or two miles.

The waters, entering through numerous domes and pits, and falling, during the rainy season, in cascades of great volume, are finally collected in River

Hall, where they form several extensive lakes, or rivers, whose connexion with Green River is known to be in deep springs appearing under arches on its margin. Whenever there is a freshet in Green River the streams in the cave are joined in a continuous body of water, the rise sometimes being 60 ft. above the low-water mark. The subsidence within is less rapid than the rise; and the streams are impassable for about seven months in each year. They are navigable from May to October, and furnish interesting features of cave scenery. The first approach is called the Dead Sea, embraced by cliffs 60 ft. high and 100 ft. long, above which a path has been made, whence a stairway leads down to the banks of the river Styx, a body of water 40 ft. long, crossed by a natural bridge. Lake Lethe comes next—a broad basin enclosed by walls 90 ft. high, below which a narrow path leads to a pontoon at the neck of the lake. A beach of the finest yellow sand extends for 500 yds. to Echo River, the largest of all being from 20 to 200 ft. wide, 10 to 40 ft. deep and about three-quarters of a mile long. It is crossed by boats. The arched passage-way is very symmetrical, varying in height from 19 to 35 ft., and famous for its musical reverberations—not a distinct echo, but an harmonious prolongation of sound for from 10 to 30 seconds after the original tone is produced. The long vault has a certain keynote of its own, which, when firmly struck, excites harmonics, including tones of incredible depth and sweetness.

There are several other streams here besides those in River Hall. On one of them F. J. Stevenson of London is said to have floated for seven hours without finding its end. A glance at the accompanying map will show that there is a labyrinth of avenues and chasms seldom visited and never fully explored. New discoveries are frequently made. An exploring party in 1904 found a curious complex of upper and lower galleries accessible from the most eastern portion of the cave; beyond which another party, in 1905, discovered several large domes previously unknown. H. C. Hovey, in 1907, was led by expert guides into still wilder recesses, where a series of five domes were found, that opened into each other by tall gateways; each dome being 60 ft. in diameter and 175 ft. high. This magnificent group has since been named “Hovey’s

Cathedral Domes." No instrumental survey of the Mammoth Cave has ever been allowed by the management. The best map possible is therefore only the result of estimates and partial measurements. The depths of the most noted pits have easily been ascertained by line and plummet and the height of several large domes has been found by the use of small balloons. While making a survey exclusively for the cave-owners in 1908, Max Kaemper of Berlin, Germany, forced an opening from the main cave into a remarkable region to which the general name of "Violet City" was given, in honour of Mrs Violet Blair Janin, who owned a third of the Mammoth Cave estate. Special features are Kaemper Hall, Blair Castle, the Marble Temple and Walhalla. There are eleven enormous pits, many large fine stalactites and stalagmites and surprisingly beautiful mural decorations. Dr Hovey made and published (1909) a new handbook embodying all known discoveries of importance, with four sketch-maps of the routes of usual exhibition.

The fauna of Mammoth Cave has been classified by F. W. Putnam, A. S. Packard and E. D. Cope, who have catalogued twenty-eight species truly subterraneous, besides those that may be regarded as stragglers from the surface. They are distributed thus: *Vertebrata*, 8 species; *Insecta*, 17; *Arachnida*, 12; *Myriapoda*, 2; *Crustacea*, 5; *Vermes*, 3; *Mollusca*, 1. Ehrenberg adds a list of 8 Polygastric *Infusoria*, 1 fossil infusorian, 5 *Phytolitharia* and several microscopic fungi. A bed of *Agaricus* was found by the writer near the river Styx; and upon this hint an attempt has been made to propagate edible fungi in this locality. All the known forms of plant-life are either fungi or allied to them, and many are only microscopic. The most interesting inhabitants of Mammoth Cave are the blind, wingless grasshoppers, with extremely long antennae; blind, colourless crayfish (*Cambarus pellucidus*, Telk.); and the blind fish, *Amblyopsis spelaeus*, colourless and viviparous, from 1 in. to 6 in. long. The *Cambarus* and *Amblyopsis* have wide distribution, being found in many other caves, and also in deep wells, in Kentucky and Indiana. Fish not blind are occasionally caught, which are apparently identical with species existing in streams

outside. The true subterranean fauna may be regarded as chiefly of Pleistocene origin; yet certain forms are possibly remnants of Tertiary life.

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(H. C. H.)

MAMORÉ, a large river of Bolivia which unites with the Beni in 10° 20′ S. to form the Madeira, one of the largest tributaries of the Amazon. It rises on the northern slope of the Sierra de Cochabamba east of the city of Cochabamba, and is known as the Chimoré down to its junction with the Chapare, or Chapari. Its larger tributaries are the Chapare, Sécure, Apere and Yacuma from the west, and the Ichila, Guapay or Grande, Ivari and Guaporé from the east. Taking into account its length only, the Guapay should be considered the upper part of the Mamoré; but it is shallow and obstructed, and carries a much smaller volume of water. The Guaporé, or Itenez, also rivals the Mamoré in length and volume, having its source in the Serra dos Parecis, Matto Grosso, Brazil, a few miles from streams flowing northward to the Tapajos and Amazon, and southward to the Paraguay and Paraná. The Mamoré is interrupted by rapids a few miles above its junction with the Beni,

but a railway 180 m. long has been undertaken from below the rapids of the Madeira. Above the rapids the river is navigable to Chimoré, at the foot of the *sierra*, and most of its tributaries are navigable for long distances. Franz Keller (in *The Amazon and Madeira Rivers*; New York, 1874) gives the outflow of the Mamoré at mean water level, and not including the Guaporé, as 2530 cub. in. per second, and the area of its drainage basin, also not including the Guaporé, as 9382 sq. m.

See Edward D. Mathews, *Up the Amazon and Madeira Rivers* (London, 1879).

MAMUN (*c.* 786-833), originally ABDALLAH, surnamed AL-MA'MŪN ("in whom men trust"), the seventh of the Abbasid caliphs of Bagdad, was born about A.D. 786, and was the second son of Harun al-Rashīd. By Harun's will he was successor-designate to his brother Amin, during whose reign he was to be governor of the eastern part of the empire. On Harun's death (809) Amin succeeded and Mamun acquiesced. Irritated, however, by the treatment he received from Amin, and supported by a portion of the army, Mamun speedily rebelled. A five years' struggle between the two brothers ended in the death of Amin and the proclamation of Mamun as caliph at Bagdad (Sept. 813). Various factions and revolts, which disturbed the first years of his reign, were readily quelled by his prudent and energetic measures. But a much more serious rebellion, stirred up by his countenancing the heretical sect of Ali and adopting their colours, soon after threatened his throne. His crown was actually on the head of his uncle Ibrahim b. Mahdi (surnamed Mobarek) for a

short time (Barbier de Meynard, in *Journal Asiatique*, March-April 1869). This inaugurated a period of tranquillity, which Mamun employed in fostering literature and science. He had already, while governor of Khorasan, founded a college there, and attracted to it the most eminent men of the day, and Bagdad became the seat of academical instruction. At his own expense he caused to be translated into Arabic many valuable books from the Greek, Persian, Chaldean and Coptic languages; and he was himself an ardent student of mathematics and astronomy. The first Arabic translation of Euclid was dedicated to him in 813. Mamun founded observatories at Bagdad and Kassiun (near Damascus), and succeeded in determining the inclination of the ecliptic. He also caused a degree of the meridian to be measured on the plain of Shinar; and he constructed astronomical tables, which are said to be wonderfully accurate.

In 827 he was converted to the heterodox faith of the Mo'tazilites, who asserted the free-will of man and denied the eternity of the Koran. The later years (829-830) of his reign were distracted by hostilities with the Greek emperor Theophilus, while a series of revolts in different parts of the Arabian empire betokened the decline of the military glory of the caliphs. Spain and part of Africa had already asserted their independence, and Egypt and Syria were now inclined to follow. In 833, after quelling Egypt, at least nominally, Mamun marched into Cilicia to prosecute the war with the Greeks, but died near Tarsus, leaving his crown to a younger brother, Motasim. The death of Mamun ended an important epoch in the history of science and letters and the period of Arabian prosperity which his father's reign had begun.

See further under CALIPHATE, sect. C., §§ 5, 6, 7.

MAMUND, a Pathan tribe and valley on the Peshawar border of the North-West Frontier Province of India. The Mamunds live partly in Bajour and partly in Afghan territory, due north of the Mohmands, a much larger tribe, with whom they must not be confounded. They are one of the clans of the Tarkanis (*q.v.*), and number 6000 fighting men; they gave much trouble during the Chitral Campaign in 1895, and again during the Mohmand Expedition in 1897 they inflicted severe losses upon General Jeffrey's brigade. (See MOHMAND.)

MAN, the word common to Teutonic languages for a single person of the human race, of either sex, the Lat. *homo*, and Gr. ἄνθρωπος; also for the human race collectively, and for a full-grown adult male human being. Teutonic languages, other than English, have usually adopted a derivative in the first sense, *e.g.* German *Mensch*. Philologists are not in agreement as to whether the Sanskrit *manu* is the direct source, or whether both are to be traced to a common root. Doubt also is thrown on the theory that the word is to be referred to the Indo-Germanic root, *men*, meaning "to think," seen in

MAN, ISLE OF (anc. *Mona*), a dominion of the crown of England, in the Irish Sea. (For map, see ENGLAND, section I.) It is about 33 m. long by about 12 broad in the broadest part. Its general form resembles that of an heraldic lozenge, though its outline is very irregular, being indented with numerous bays and narrow creeks. Its chief physical characteristic is the close juxtaposition of mountain, glen and sea, which has produced a variety and beauty of scenery unsurpassed in any area of equal size elsewhere.

The greater part of its surface is hilly. The hills, which reach their culminating point in Snaefell (2034 ft.), have a definite tendency to trend in the direction of the longer axis, but throw out many radiating spurs, which frequently extend to the coast-line. They are, for the most part, smooth and rounded in outline, the rocks being such as do not favour the formation of crags, though, owing to the rapidity of their descent, streams have frequently rent steep-walled craggy gulleys in their sides. The strength of the prevalent westerly winds has caused them to be treeless, except in some of the lower slopes, but they are clad with verdure to their summits. Rising almost directly from the sea, they appear higher than they really are, and therefore present a much more imposing appearance than many hills of greater altitude. On the south-west, where they descend precipitously into the sea, they unite with the cliffs to the north and south of them to produce the most striking part of the coast scenery for which the isle is remarkable. But, indeed, the whole coast from Peel round by the Calf, past Castletown and Douglas to Maughold Head, near Ramsey, is distinguished by rugged

grandeur. From Ramsey round by the Point of Ayre to within a few miles of Peel extend low sandy cliffs, bordered by flat sandy shores, which surround the northern plain. This plain is relieved only by a low range of hills, the highest of which attains an elevation of 270 ft. The drainage of the island radiates from the neighbourhood of Snaefell, from which mountain and its spurs streams have on all sides found their way to the sea. The most important of these are the Sulby, falling into the sea at Ramsey; the *Awin-glass* (bright river) and the *Awin-dhoo* (dark river), which unite their waters near Douglas; the *Neb*, at the mouth of which Peel is situated; and the *Awin-argid* (silver river, now called the Silverburn), which joins the sea at Castletown. There are no lakes. The narrow, winding glens thus formed, which are studded with clumps of fir, sycamore and mountain ash, interspersed with patches of gorse, heather and fern, afford a striking and beautiful contrast to the bare mountain tops. Traces of an older system of drainage than that which now exists are noticeable in many places, the most remarkable being the central depression between Douglas and Peel. The chief bays are, on the east coast, Ramsey, with an excellent anchorage, Laxey, Douglas, Derbyhaven, Castletown and Port St Mary; and, on the west coast, Port Erin and Peel.

Geology.—The predominant feature in the stratigraphy of the Isle of Man is, in the words of G. W. Lamplough,[1] "the central ridge of slate and greywacke, which seems to have constituted an insulated tract at as early a date as the beginning of the Carboniferous period. This prototype of the present island appears afterwards to have been enfolded and obliterated by the sediments of later times; but with the progress of denudation the old ridge has once more emerged from beneath this mantle." This mass of ancient rocks, the Manx Slate Series, has been divided locally into the Barrule slates, the Agneesh and other grit beds; and the Lonan and Niarbyl Flags. The whole series strikes N.E.-S.W., while structurally the strata form part of a synclinorium, the higher beds

being on the N.W. and S.E. sides of the islands, the lower beds in the interior; although the subordinate dips appear to indicate an anticlinal structure. These rocks have been greatly crumpled; and in places, notably in Sully Glen, thrusting has developed a well-marked crush-breccia. So much has this folding and compression toughened the soft argillaceous rocks that the Barrule Slate, for example, is almost everywhere found occupying the highest points while the hard but more joined grits and flags occupy the lower ground on the mountain flanks. The Manx Series is penetrated and altered by large masses of granite at Dhoon, Foxdale and one or two other spots; and dykes, more or less directly associated with these masses, are numerous. No satisfactory fossils have yet been obtained from these rocks, but they are regarded, provisionally, as of Upper Cambrian age. Carboniferous rocks, including a basal conglomerate, white limestone with abundant fossils, and the black "Posidonomya Beds" (some of which are polished as a black marble) occur about Castletown, Poolvash Bay and Langness; and the basement beds appear again on the west coast at Peel. The cliffs and foreshore at Scarlet Point exhibit contemporaneous Carboniferous tuffs, agglomerates and basalts, as well as later dolerite dykes, in a most striking manner. Here too may be seen some curious effects of thrusting in the limestones. At the northern end of the island the Manx Slates end abruptly in an ancient sea-cliff which crosses between Ramsey and Ballaugh. The low-lying country beyond is formed of a thick mass of glacial sands, gravels and boulder clay. In the Bride Hills are to be seen glacial mounds rising 150 ft. above the level of the plain. The depressions known as the Curragh, now drained but still peaty in places, probably represent the sites of late glacial lakes. Glacial deposits are found also in all parts of the island. Beneath the thick drift of the plain, Carboniferous, Permian and Trassic rocks have been proved to lie at some depth below the present sea-level. On the coast near the Point of Ayr is a raised beach. Silver-bearing lead ore, zinc and copper are the

principal minerals found in the Isle of Man; the most important mining centres being at Foxdale and Laxey.

Climate.—The island is liable to heavy gales from the south-west. Of this the trend of the branches of the trees to the north-east is a striking testimony. But it is equally subject to the influence of the warm drift from the Atlantic, so that its winters are mild, and, influenced by the less changeable temperature of the sea, its summers cool. The mean annual temperature is 49°.0 F., the temperature of the coldest month (January) being 41°.5, and the warmest (August) 58°.5, giving an extreme annual range of temperature of 17°.1 only, while the average temperature in spring is 46°.0, in summer 57°.2, in autumn 50°.9 and in winter 42°.0. Further evidence of the mildness of the climate is afforded by the fact that fuchsias, hydrangeas, myrtles and escallonias grow luxuriantly in the open air. Its rainfall, placed as it is between mountain districts in England, Ireland, Scotland and Wales, is naturally rather wet than dry. Statistics, however, reveal remarkable divergencies in the amounts of rain in the different parts of the island, varying from 61 in. at Snaefell to 25 in. at the Calf of Man. In the more populous districts it varies from 46 in. at Ramsey, and 45 in. at Douglas, to 38 in. at Peel and 34 in. at Castletown. Of sunshine the Isle of Man has a larger share than any portion of the United Kingdom except the south and south-east coasts and the Channel Islands. Briefly, then, the climate of the island may be pronounced to be equable and sunny, and, though humid, decidedly invigorating; its rainfall, though it varies greatly, is excessive in the populous districts; and its winds are strong and frequent, and usually mild and damp.

Fauna.—Like Ireland, the Isle of Man is exempt from snakes and toads, a circumstance traditionally attributed to the agency of St Patrick, the patron saint of both islands. Frogs, however, have been introduced from Ireland, and both the sand lizard and the common lizard are found.

Badgers, moles, squirrels and voles are absent and foxes are extinct. Fossil bones of the Irish elk are frequently found, and a complete skeleton of this animal is to be seen at Castle Rushen. The red deer, which is referred to in the ancient laws and pictured on the runic crosses, became extinct by the beginning of the 18th century. Hares are less plentiful than formerly, and rabbits are not very numerous. Snipe are fairly common, and there are a few partridges and grouse. The latter, which had become extinct, were reintroduced in 1880. Woodcock, wild geese, wild ducks, plover, widgeon, teal, heron, bittern, kingfishers and the Manx shearwater (*Puffinus anglorum*) visit the island, but do not breed there. The puffin (*Fratercula artica*) is still numerous on the Calf islet in the summer time. The peregrine falcon, which breeds on the rocky coast, and the chough have become very scarce. The legal protection of sea-birds (local act of 1867) has led to an enormous increase in the number of gulls. A variety of the domestic cat, remarkable for the absence or stunted condition of the tail, is peculiar to the island.

Flora.—Like the fauna, the flora is chiefly remarkable for its meagreness. It contains at most 450 species as compared with 690 in Jersey. Alpine forms are absent. But what it lacks in variety it makes up in beauty and quantity. For the profusion of the gorse-bloom and the abundance of spring flowers, especially of primroses, and of ferns, the Isle of Man is probably unrivalled.

People.—The Manx people of the present day are mainly of Scandio-Celtic origin, with some slight traces of earlier races. They have large and broad heads, usually broader than those of their brother Celts (*Goidels*) in Ireland and Scotland, with very broad, but not specially prominent cheek-bones. Their faces are usually either scutiform, like those of the Northmen, or oval, which is the usual Celtic type, and their noses are almost always of good length, and straighter than is general among Celtic races. Light eyes

and fair complexion, with rather dark hair, are the more usual combinations. They are usually rather tall and heavily built, their average height (males) being 5 ft. 7½ in., and average weight (naked) 155 lb. The tendency of the population to increase is balanced by emigration. It reached its maximum in 1891. Since then it has slightly declined. A noticeable feature is its greater proportionate growth in the towns, especially in Douglas, than in the country. The country population reached its maximum in 1851. Since then it has been shrinking rapidly, especially in the northern district.

Sheadings, Parishes and Towns.		1726.	1821.	1871.	1901.
Rushen.	Malew (P.)	890	2,649	2,466	2,113
	Castletown (T.)	785	2,036	2,318	1,963
	Arbory (P.)	661	1,455	1,350	802
	Rushen (P.)	813	2,568	3,665	3,277
Middle.	Santon (P.)	376	800	628	468
	Braddan (P.)	780	1,754	2,215	2,177
	Douglas (T.)	810	6,054	13,846	19,149
	Onchan (P.)	370	1,457	1,620	3,942
Glenfalca.	Marown (P.)	499	1,201	1,121	973
	German (P.)	510	1,849	1,762	1,230
	Peel (T.)	475	1,909	3,496	3,306
	Patrick (P.)	745	2,031	2,888	1,925
Garff.	Lonan (P.)	547	1,846	3,741	2,513
	Maughold (P.)	529	1,514	1,433	887
	Ramsey (T.)	460	1,523	3,861	4,672
Ayre.	Lezayre (P.)	1,309	2,209	1,620	1,389
	Bride (P.)	612	1,001	880	539
	Andreas (P.)	967	2,229	1,757	1,144
Michael.	Jurby (P.)	483	1,108	788	504
	Ballaugh (P.)	806	1,467	1,077	712
	Michael (P.)	643	1,427	1,231	928
Total		14,070	40,087	53,763	54,613

Chief Political Divisions and Towns.—The island is divided into six sheadings (so named from the Scandinavian *skeða-Þing*, or ship-district), called Glenfaba, Middle, Rushen, Garff, Ayre and Michael, each of which has its officer, the coroner, whose functions are similar to those of a sheriff; and there are seventeen parishes. For the towns see

CASTLETOWN, DOUGLAS, PEEL and RAMSEY. The principal villages are Ballasalla, Ballaugh, Foxdale, Laxey, Michael, Onchan, Port Erin and Port St Mary.

Communications.—There is communication by steamer with Liverpool, Glasgow, Greenock, Belfast, Silloth, Whitehaven, Belfast and Dublin throughout the year and, during the summer season, there are also steamers plying to Androssan, Heysham, Fleetwood and Blackpool. A daily mail was established in 1879. The internal communications are excellent. The roads are under the management of a board appointed by the Tynwald Court, a surveyor-general, and parochial surveyors. They are maintained by a system of licences on public-houses, carriages, carts and dogs, and a rate on real property. There are railways between Douglas, Ramsey, Peel, Castletown, Port Erin and Port St Mary, the line between Douglas and Ramsey being via St John's and Michael. Electric tramways run from Douglas to Ramsey via Laxey, from Douglas to Port Soderick, and from Laxey to the summit of Snaefell.

Industries. (*a*) *Agriculture.*—The position of the Manx farmers, though they generally pay higher rents than their compeers in those countries do, is, except in the remote parts of the island, more favourable than that of the English or Scottish farmers. The best land is in the north and south. The farms are principally held on lease and small holdings have almost entirely disappeared. The cultivated area is about 93,000 acres, or 65% of the whole. The commons and uncultivated lands on the mountains are also utilized for pasturage. Oats occupy about three-fourths of the area under corn crops, barley about one-sixth. The amount of wheat and other corn crops is very trifling. Neither Manx wheat nor barley is as good on an average as English; but oats is, on the whole, fully equal to what is grown on the mainland. Turnips, which are an excellent crop, are largely exported, and the dry and sandy soil of the

north of the island is very favourable for the growth of potatoes. The white and red clover and the common grasses grow luxuriantly, and the pasturage is, generally speaking, good. Some of the low-lying land, especially in the north, is much in need of systematic drainage. The livestock, largely in consequence of the premiums given by the insular government and the local agricultural society to bulls, heavy and light stallions and cart mares, now approximates very closely in quality to the stock in the north of England. Dairying, owing to the large number of summer visitors, is the most profitable department of agricultural industry. Apples, pears and wall fruit do not succeed very well, but the soil is favourable for the cultivation of strawberries, raspberries, gooseberries, currants and vegetables. Both agricultural and market-garden produce are quite insufficient to supply the demand in the summer.

(*b*) *Fishing.*—The important place which the fishing industry anciently held in the social organization of the Isle of Man is quaintly reflected in the wording of the oath formerly taken by the deemsters, who promised to execute the laws between the sovereign and his subjects, and "betwixt party and party, as indifferently as the herring backbone doth lie in the midst of the fish." The statutes and records abound in evidence of the great extent to which both the people and their rulers were dependent on the produce of the sea. The most numerous fish are herrings, cod, mackerel, ling, haddock, plaice, sole, fluke, turbot and brett. The industry is, however, in a decaying condition, especially the herring fishery, which, for reasons which have not been satisfactorily ascertained, fails periodically. The amount of fish caught, except herrings, is not sufficient to supply the local demand in the summer, though some of the fish named are exported during the rest of the year. About 250 vessels, aggregating 4260 tons, with crews

numbering 4250, are employed in this industry. A fish hatchery has been established at Port Erin by the insular government.

(*c*) *Mining.*—There is no doubt that, in proportion to its area, the metalliferous wealth of the Isle of Man has been very considerable. Two of its mines, Laxey and Foxdale, have stood for a long series of years in the first rank in the British Islands for productiveness of zinc and silver lead respectively. These metals have constituted its principal riches, but copper pyrites and hematite iron have also been raised in marketable quantities, while only very small amounts of the ores of nickel and antimony have been found. The mines are rented from the Crown as lord of the manor. The value of the ore produced is about £40,000 annually. Other economic products are clay, granite, limestone, sandstone, slate (of an inferior quality) and salt, which has been discovered near the Point of Ayre.

(*d*) *Textiles, &c*.—Since labour has become scarcer and dearer textile industries have been declining, being unable to compete with larger and more completely organized manufactories elsewhere. The principal manufactured articles are woollen cloths and blankets, hemp ropes and cotton, and herring nets. A few fishing vessels are built, and brewing is a prosperous industry. But, apart from agriculture, the most important industry (for so it may be called) is that of the provision for summer visitors, nearly half a million of whom come to the island annually.

Commerce.—The chief exports are lead, zinc, turnips, ropes, cotton nets and salt. The imports consist chiefly of timber, provisions, livestock, poultry, flour, fruit, vegetables and eggs. In 1906 the tonnage of vessels (other than fishing or wind-bound vessels) cleared for traffic was 720,790. The number of vessels (other than fishing vessels) registered as belonging to the island in 1906 was 79.

Government.—The government of the island is vested in a lieutenant-governor, appointed by the Crown; in a Council, which is the upper branch of the legislature; in the House of Keys, which is the lower branch; and in the Tynwald Court. The Council and Keys sit separately as legislative bodies, but they sit in the Tynwald Court as distinct bodies with co-ordinate powers to transact executive business and to sign Bills. The Tynwald Court controls the surplus revenue, after the payment of the cost of government and of a fixed contribution of £10,000 to the imperial exchequer, subject to the supervision of the Treasury and the veto of the lieutenant-governor, and it appoints boards to manage the harbours, highways, education, local government, and lunatic and poor asylums. The Imperial government, after intimating its intention to Tynwald, fixes the rates of the customs duties, but Tynwald can by resolution "impose, abolish or vary" the customs duties subject to the approval of parliament or the Treasury, such change to take effect immediately and to continue for six months, and, if parliament be then sitting, to the end of the session, provided that the same be not in the meantime annulled by the passing of an act of parliament, or a Treasury minute. The approval of the sovereign of the United Kingdom in Council is essential to every legislative enactment. Acts of the imperial parliament do not affect the island except it be specially named in them. The lieutenant-governor, who is the representative of the sovereign, presides in the Council, in the Tynwald Court, in the High Court of Justice (Staff of Government division) and in the Court of General Gaol Delivery. He is the supreme executive authority, and he shares the control of the legislative and administrative functions, including the management of the revenue and the control of its surplus, with the Tynwald Court; he has also the power of veto as regards the disposal of surplus revenue and the nature of proposed harbour works, and his signature is necessary to the validity of all acts. It has been the practice for him to act as chancellor of the exchequer and to initiate all questions concerning the raising or expenditure of public funds. The Council consists of the lieutenant-governor, the lord-bishop of the diocese,

the clerk of the rolls, the two deemsters, the attorney-general, the archdeacon (all of whom are appointed by the Crown) and the vicar-general, who is appointed by the bishop. No act of the governor and Council is valid unless it is the act of the governor and at least two members of the Council. The House of Keys (for origin of the name see KEY) is one of the most ancient legislative assemblies in the world. It consists of twenty-four members, elected by male and female owners or occupiers of property. Each of the six sheadings elects three members; the towns of Castletown, Peel and Ramsey one each, and Douglas five. There is no property qualification required of the members, and the house sits for five years unless previously dissolved by the lieutenant-governor.

Law.—The High Court of Justice, of which the lieutenant-governor is president, contains three divisions: viz. the Chancery Division, in which the clerk of the rolls sits as judge, the Common Law Division, of which the deemsters are the judges, the Staff of Government Division, in which the governor and three judges sit together. The jurisdiction of the Chancery and Common Law Division is in the main similar to that of the corresponding divisions in the English Courts. The Staff of Government exercises appellate jurisdiction, similar to that of the Appeal Courts in England. The Common Law Courts for the southern division of the island are held at Douglas and Castletown alternately and those for the northern division at Ramsey, once in three months. Actions in these courts are heard by a deemster and a special or common jury. The Chancery Court sits once a fortnight at Douglas. The deemsters also have summary jurisdiction in matters of debt, actions for liquidated damages under £50, suits for possession of real or personal property, petitions for probate, &c. These courts, called Deemsters' Courts, are held weekly, alternately at Douglas and Castletown, by the deemster for the southern division of the island, and at Ramsey and Peel by the deemster for the northern division. Criminal cases are heard by the

magistrates or a high-bailiff and are (with the exception of minor cases which may be dealt with summarily) sent on by them for trial by a deemster and a jury of six, who hear the evidence and determine whether there is sufficient ground for sending the case for trial before the Court of General Gaol Delivery, thus discharging the functions of the Grand Jury in England. The Court of General Gaol Delivery is the Supreme Criminal Court and is presided over by the lieutenant-governor, who is assisted by the clerk of the rolls and the two deemsters. The high-bailiffs hold weekly courts in the four towns for the recovery of debts under forty shillings and for the trial of cases usually brought before a stipendiary magistrate in England. The magistrates (J.P.'s) also hold regular courts in the towns for the trial of breaches of the peace and minor offences. There is a coroner in each of the six sheadings. These officers are appointed annually by the lieutenant-governor and perform duties similar to those of a sheriff's officer in England. Inquests of death are held by a high-bailiff and jury. The Manx Bar is distinct from that of England. Its members, called "Advocates," combine the functions of barrister and solicitor. The laws relating to real property still retain much of their ancient peculiarity, but other branches of law have of late years by various acts of Tynwald been made practically identical with English law.

As regards real property the general tenure is a customary freehold devolving from each possessor to his next heir-at-law. The descent of land follows the same rules as the descent of the crown of England. The right of primogeniture extends to females in default of males in the direct line. The interest of a widow or widower, being the first wife or husband of a person deceased, is a life estate in one-half of the lands which have descended hereditarily, and is forfeited by a second marriage; a second husband or second wife is only entitled to a life interest in one-fourth, if there be issue of the first marriage. Of the land

purchased by the husband the wife surviving him is entitled to a life interest in one moiety. By a statute of the year 1777 proprietors of land are empowered to grant leases for any term not exceeding twenty-one years in possession without the consent of the wife.

Church.—It is not known by whom Christianity was introduced into Man, but from the large proportion of names of Irish ecclesiastics surviving in the appellations of the old Manx *keeills*, or cells, which are of similar type to the Irish oratories of the 6th and 7th centuries, and in the dedications of the parish churches, which are usually on ancient sites, it may be reasonably conjectured that Manxmen were, for the most part, Christianized by Irish missionaries. During the incursions of the pagan Vikings Christianity was almost certainly extirpated and it was probably not reintroduced before the beginning of the 11th century. The two most important events in the history of the medieval Manx Church were the formation of the diocese of *Sodor* (*q.v.*) and the foundation of the abbey of Rushen, a branch of the Cistercian abbey of Furness, in 1134. This latter event was important because the Cistercians were exempted from all episcopal visitation and control, by charter granted by the pope, and were, therefore, only subject to his rule and that of the abbots of their own order. From this time till the Reformation we find that there was an almost continuous struggle between the laity and the spiritual barons and monks, who had obtained great power and much property in the island. In 1458 the diocese was placed under York. The dissolution of the religious houses in Man was not brought about by the English Act of 1539, which did not apply to the island, but by the arbitrary action of Henry VIII. From such evidence as is available it would seem that the Reformation was a very slow process. When Isaac Barrow (uncle of his well-known namesake) became bishop in 1663 the condition of the Church was deplorable, but under him and his able and saintly successors, Thomas Wilson (1698-

1755) and Mark Hildesley (1755-1773). it attained to a very much higher level than the English Church during the same period. After Hildesley's time it was again neglected, and successful missions by John Wesley and others resulted in the establishment and rapid increase of Nonconformity. It was not till the second decade of the 19th century that the condition of the Church began to improve again, and this improvement has steadily continued. In 1878 a Sodor and Man theological school was established for the training of candidates for holy orders. This school has been affiliated to Durham University. In 1880 four rural deaneries were established, and commissioners were constituted as trustees of endowments for Church purposes. In 1895 a cathedral chapter, with four canons, was constituted under the name of the "Dean and Chapter of Man," the bishop being the dean of the cathedral church. A Church Sustentation Fund was established by Bishop Straton in 1894, with a view to supplementing the incomes of the clergy, which had been greatly reduced on account of the low price of corn. There have been several acts giving Nonconformists equal rights with Churchmen. Among these are the Burials Acts of 1881 and 1895, which permit burials to take place in churchyards without the rites of the Church of England, and allow any burial service, provided it be Christian, in mortuary chapels. At the present day Nonconformists, chiefly Wesleyan Methodists, probably outnumber Churchmen, and there is a small number of Roman Catholics and Presbyterians. The bishop, who has a seat, but not a vote, in the House of Lords, is assisted by an archdeacon, a vicar-general, a registrar and a sumner-general. The jurisdiction of the only remaining ecclesiastical court, which is presided over by the vicar-general, as representing the bishop, is mainly in connexion with affiliation questions, the swearing-in of churchwardens and the granting of faculties. The power of the Manx Convocation to make canons, though not exercised since 1704, has never been abrogated, and so far affords a token that the Manx Church is a separate

national Church governed by its own laws, which, however, must be approved by the insular Legislature.

Education.—It was not till 1872, when the insular Legislature passed the Public Elementary Education Act, that the Manx State undertook any direct responsibility for education. This act differed from the English Act of 1870 in three important particulars: (1) it at once constituted every town and parish a school district under a school board; (2) the attendance of children was made compulsory; and (3) every elementary school, those in connexion with the Church of Rome excepted, was obliged to provide for non-sectarian instruction in religious subjects, and for the reading of the Bible accompanied by suitable explanation. Since the date of this act education has made extraordinary strides. It became free in 1892, and a higher-grade school was established in Douglas in 1894. The public elementary schools, which are nearly all managed by School Boards, are subject to the control of a local "Council of Education" appointed by the Tynwald Court; but, as the Manx Act of 1872 requires that, in order to obtain a government grant, the schools shall fulfil the conditions contained in the minutes of the education department at Whitehall, they are examined by English inspectors and compelled to attain the same standard of efficiency as the English and Welsh schools. In 1907 an act establishing a system of secondary education was passed by the Legislature. The total number of public elementary schools in 1906 was 47, 42 being board and 5 denominational. Besides King William's College, opened in 1833, which provided a similar education to that obtainable at the English public schools, there are grammar schools in Douglas, Ramsey and Castletown.

The Manx language (see CELT: *Language*) still lingers, the census of 1901 showing that there were about 4400 people who understood something of it. There is now no one who does not speak English.

Economics.—Municipal government was established in 1860, and in 1876 vaccination was made compulsory, as also was the registration of births, marriages and deaths in 1878. It was not till 1884 that the sanitation of the towns was seriously taken in hand; but ten years more elapsed before the sanitary condition of the island was dealt with by the passing of an act which constituted parish and village districts, with commissioners elected by the people, who had, in conjunction with a board elected by the Tynwald Court and an inspector appointed by it, to attend to all questions relating to sanitation and infectious diseases. As a result of these measures the death-rate has been greatly reduced. In 1888 a permissive poor law was established; it has been adopted by all the towns except Peel and by seven of the seventeen country parishes. Before this date the poor had been dependent on voluntary relief, which broke down owing to the growth of a temporarily employed class occupied in administering to the wants of the summer visitors. The total number of persons in receipt of poor relief averages about 920, and that of lunatics about 212. The average number of births during the five years 1902-1906 was 21.6, of marriages 6.1, and of deaths 17.6 per thousand. The rateable annual value of the parishes, towns and villages is about £400,000. The revenue for the year ending the 31st of March 1907 was £86,365, and the expenditure £75,728. The largest revenue raised was £91,193 in 1901, and the debt reached its maximum amount, £219,531, in 1894.

History.—The history of the Isle of Man falls naturally into three periods. In the first of these the island was inhabited by a Celtic people. The next is marked by the Viking invasions and the establishment of Scandinavian rule. The third period is that of the English dominion. The secular history of the Isle of Man during the Celtic period is an absolute blank, there being no trustworthy record of any event whatever before the incursions of the Northmen, since the exploits attributed to Baetan MacCairill, king of Ulster,

at the end of the 6th century, which were formally supposed to have been performed in the Isle of Man, really occurred in the country between the Firths of Clyde and Forth. And it is clear that, even if the supposed conquest of the Menavian islands—Man and Anglesey—by Edwin of Northumbria, in 616, did take place, it could not have led to any permanent results; for, when the English were driven from the coasts of Cumberland and Lancashire soon afterwards, they could not well have retained their hold on the island to the west of these coasts. It is, however, possible that in 684, when Ecfrid laid Ireland waste from Dublin to Drogheda, he temporarily occupied Man. During the period of Scandinavian domination there are two main epochs—one before the conquest of Man by Godred Crovan in 1079, and the other after it. The earlier epoch is characterized by warfare and unsettled rule, the later is comparatively peaceful. Between about A.D. 800 and 815 the Vikings came to Man chiefly for plunder; between about 850 and 990, when they settled in it, the island fell under the rule of the Scandinavian kings of Dublin; and between 990 and 1079, it was subject to the powerful earls of Orkney. The conqueror Godred Crovan was evidently a remarkable man, though little information about him is attainable. According to the *Chronicon Manniae* he "subdued Dublin, and a great part of Leinster, and held the Scots in such subjection that no one who built a vessel dared to insert more than three bolts." The memory of such a ruler would be likely to survive in tradition, and it seems probable therefore that he is the person commemorated in Manx legend under the name of King Gorse or Orry. The islands which were under his rule were called the *Suðr-eyjar* (Sudreys or the south isles), in contradistinction to the *norðr-eyjar*, or the north isles, *i.e.* the Orkneys and Shetlands, and they consisted of the Hebrides, and of all the smaller western islands of Scotland, with Man. At a later date his successors took the title of *Rex Manniae el Insularum*. Olaf, Godred's son, was a powerful monarch, who, according to the Chronicle, maintained "such close alliance with the kings of Ireland and Scotland that no one ventured to disturb the Isles during his time" (1113-1152). His son, Godred, who for a

short period ruled over Dublin also, as a result of a quarrel with Somerled, the ruler of Argyll, in 1156, lost the smaller islands off the coast of Argyll. An independent sovereignty was thus interposed between the two divisions of his kingdom. Early in the 13th century, when Reginald of Man did homage to King John, we hear for the first time of English intervention in the affairs of Man. But it was into the hands of Scotland that the islands were ultimately to fall. During the whole of the Scandinavian period the isles were nominally under the suzerainty of the kings of Norway, but they only occasionally asserted it with any vigour. The first to do so was Harold Haarfager about 885, then came Magnus Barfod about 1100, both of whom conquered the isles. From the middle of the 12th century till 1217 the suzerainty, owing to the fact that Norway was a prey to civil dissensions, had been of a very shadowy character. But after that date it became a reality and Norway consequently came into collision with the growing power of Scotland. Finally, in 1261, Alexander III. of Scotland sent envoys to Norway to negotiate for the cession of the isles, but their efforts led to no result. He therefore initiated hostilities which terminated in the complete defeat of the Norwegian fleet at Largs in 1263. Magnus, king of Man and the Isles, who had fought on the Norwegian side, was compelled to surrender all the islands over which he had ruled, except Man, for which he did homage. Two years later Magnus died and in 1266 the king of Norway, in consideration of the sum of 4000 marks, ceded the islands, including Man, to Scotland. But Scotland's rule over Man was not firmly established till 1275, when the Manx were defeated in a decisive battle at Ronaldsway, near Castletown. In 1290 we find Edward I. of England in possession of Man, and it remained in English hands till 1313, when it was taken by Robert Bruce after besieging Castle Rushen for five weeks. Then, till 1346, when the battle of Neville's Cross decided the long struggle between England and Scotland in England's favour, there followed a confused period when Man was sometimes under English and sometimes under Scottish rule. About 1333 it had been granted by King Edward III. to William de Montacute, 1st earl of Salisbury, as his

absolute possession, without reserving any service to be rendered to him. In 1392 his son sold the island “with the crowne” to Sir William Le Scroope. In 1399 Henry IV. caused Le Scroope, who had taken Richard’s side, to be beheaded. The island then came into the possession of the crown and was granted to Henry de Percy, earl of Northumberland, but, he having been attainted, Henry IV., in 1406, made a grant of it, with the patronage of the bishopric, to Sir John Stanley, his heirs and assigns, on the service of rendering two falcons on paying homage and two falcons to all future kings of England on their coronation.

With the accession of the Stanleys to the throne there begins a better epoch in Manx history. Though the island’s new rulers rarely visited its shores, they placed it under responsible governors, who, in the main, seem to have treated it with justice. Of the thirteen members of the family who ruled in Man, the second Sir John Stanley (1414-1432), James, the 7th earl (1627-1651), and the 10th earl of the same name (1702-1736) had the most important influence on it. The first curbed the power of the spiritual barons, introduced trial by jury, instead of trial by battle, and ordered the laws to be written. The second, known as the Great Stanley, and his wife, Charlotte de la Tremoille (or Tremouille), are probably the most striking figures in Manx history. In 1643 Charles I. ordered him to go to Man, where the people, who were no doubt influenced by what was taking place in England, threatened to revolt. But his arrival, with English soldiers, soon put a stop to anything of this kind. He conciliated the people by his affability, brought in Englishmen to teach various handicrafts and tried to help the farmers by improving the breed of Manx horses, and, at the same time, he restricted the exactions of the Church. But the Manx people never had less liberty than under his rule. They were heavily taxed; troops were quartered upon them; and they also had the more lasting grievance of being compelled to accept leases for three lives instead of holding their land by the “straw” tenure which they considered to be equivalent to a customary inheritance. Six months after the

death of the king Stanley received a summons from General Ireton to surrender the island, which he haughtily declined. In August 1651 he went to England with some of his troops, among whom were 300 Manxmen, to join King Charles II., and he and they shared in the decisive defeat of the Royalists at Worcester. He was captured and confined in Chester Castle, and, after being tried by court martial, was executed at Wigan. Soon after his death the Manx Militia, under the command of William Christian, rose against the Countess and captured all the insular forts except Rushen and Peel. They were then joined by a parliamentary force under Colonel Duckenfield, to whom the Countess surrendered after a brief resistance. Fairfax had been appointed "Lord of Man and the Isles" in September, so that Man continued under a monarchical government and remained in the same relation to England as before. The restoration of Stanley government in 1660 therefore caused as little friction and alteration as its temporary cessation had. One of the first acts of the new lord, Charles (the 8th earl), was to order Christian to be tried. He was found guilty and executed. Of the other persons implicated in the rebellion only three were excepted from the general amnesty. But by order in Council they were pardoned, and the judges responsible for the sentence on Christian were punished. His next act was to dispute the permanency of the tenants' holdings, which they had not at first regarded as being affected by the acceptance of leases, a proceeding which led to an almost open rebellion against his authority and to the neglect of agriculture. In lieu of it the people devoted themselves to the fisheries and to contraband trade. The agrarian question was not settled till 1704, when James, Charles's brother and successor, largely through the influence of Bishop Wilson, entered into a compact with his tenants, which was embodied in an act, called the "Act of Settlement." Their compact secured the tenants in the possession of their estates in perpetuity on condition of a fixed rent, and a small fine on succession or alienation. From the great importance of this act to the Manx people it has been called their *Magna Carta*. As time went on, and the value of the estates increased, the rent

payable to the lord became so small in proportion as to be almost nominal. James died in 1736 and the sovereignty of the isle passed to James Murray, 2nd duke of Atholl. In 1764 he was succeeded by his only surviving child Charlotte, Baroness Strange, and her husband, John Murray, who, in right of his wife, became Lord of Man. About 1720 the contraband trade greatly increased. In 1726 it was, for a time, somewhat checked by the interposition of parliament, but during the last ten years of the Atholl régime (1756-1765) it assumed such proportions that, in the interests of the imperial revenue, it became necessary to suppress it. With a view to so doing an Act of Parliament, called the "Revesting Act," was passed in 1765, under which the sovereign rights of the Atholls and the customs revenues of the island were purchased for the sum of £70,000, and an annuity of £2000 was granted to the duke and duchess. The Atholls still retained their manorial rights, the patronage of the See, and certain other perquisites, which were finally purchased for the excessive sum of £417,144 in 1828. Up to the time of the Revestment the Tynwald Court passed laws concerning the government of the island in all respects and had control over its finances, subject to the approval of the lord. After the Revestment, or rather after the passage of the "Mischief Act" in the same year, Imperial Parliament legislated with respect to customs, harbours and merchant shipping, and, in measures of a general character, it occasionally inserted clauses by which penalties in contravention of the acts of which they formed part might be enforced in the island. It also assumed the control of the insular customs duties. Such were the changes which, rather than the transference of the sovereignty from the lord to the king of Great Britain and Ireland, modified the Constitution of the Isle of Man. Its ancient laws and tenures were not interfered with, but in many ways the Revestment adversely affected it. The hereditary lords were far from being model rulers, but most of them had taken some personal share in its government, and had interested themselves in the well-being of its inhabitants. But now the whole direction of its affairs was handed over to officials, who regarded the island as a pestilent nest of smugglers, from

which it was their duty to extract as much revenue as possible. Some alleviation of this state of things was experienced between 1793 and 1826 when the 4th duke of Atholl was appointed governor, since, though he quarrelled with the Keys and was unduly solicitous for his pecuniary interests, he did occasionally exert himself to promote the welfare of the island. After his departure the English officials resumed their sway. But they were more considerate than before. Moreover, since smuggling, which had only been checked, not suppressed, by the Revesting Act, had by that time almost disappeared, and the Manx revenue was producing a large and increasing surplus, the Isle of Man came to be regarded more favourably, and, thanks to this fact and to the representations of the Manx people to English ministers in 1837, 1844 and 1853, it obtained a somewhat less stringent customs tariff and an occasional dole towards erecting its much neglected public works. Since 1866, when the Isle of Man obtained a measure of at least nominal "Home Rule," the Manx people have made remarkable progress, and at the present day form a prosperous community.

Monuments.—The prehistoric monuments in Man are numerous. There are earth entrenchments, seemingly of the earliest period; fragments of stone circles and alignments; burial cairns with stone cists of several successive periods; urn mounds and *crannoges* or lake dwellings. The monuments belonging to the historic period begin with the round tower on Peel islet, the humble Celtic *keeills* and the sculptured crosses in which the island is especially rich. Of these crosses about one-fourth have inscriptions in the old Norse language. The origin and history of the early buildings remaining on the island are obscure. The castles of Rushen and Peel are the only important buildings of a military character which survive, but the remains of ecclesiastical buildings are numerous and interesting, though, with the exception of St German's Cathedral on Peel islet, now in ruins, they are only small and simple structures.

Arms.—There has been much controversy about the origin of the arms of the island—the "three-legs" found on a beautiful pillar cross near Maughhold churchyard belonging to the latter part of the 14th century. It was probably originally a sun symbol and was brought from Sicily by the Vikings. The motto *quocunque jeceris slabit* is of comparatively recent origin.

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Hall Caine's novels, *The Deemster*, *The Manxman*, &c., have no doubt tended to popularize the island. The most truthful description of the social life of the people is to be found in a novel entitled *The Captain of the Parish*, by John Quine. *Bibliotheca Monensis* (*Manx Society*, vol. xxiv.) contains a good list of MSS. and books relating to the island up to 1876, and A. W. Moore's *History of the Isle of Man* has a list of the most important MSS. and books up to 1900. (A. W. M.)

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1 G. W. Lamplough, *The Geology of the Isle of Man*, Mem. Geol. Survey (1903).

MANAAR, GULF OF, a portion of the Indian Ocean lying between the coast of Madras and Ceylon. Its northern limit is the line of

rocks and islands called Adam's Bridge. Its extreme width from Cape Comorin to Point de Galle is about 200 miles.

MANACOR, a town of Spain in the island of Majorca, 40 m. by rail E. of Palma. Pop. (1900), 12,408. Manacor has a small trade in grain, fruit, wine, oil and live stock. In the neighbourhood are the cave of Drach, containing several underground lakes, and the caves of Artá, one of the largest and finest groups of stalactite caverns in western Europe.

MANAGE, to control, direct, or be in a position or have the capacity to do anything (from Ital. *maneggiare*, to train horses, literally to handle; Lat. *manus*, hand). The word was first used of the "management" of a horse. Its meanings have been much influenced by the French *ménager*, to direct a household or *ménage* (from late Lat. *mansio*, house); hence to economize, to husband resources, &c. The French *ménage*, act of guiding or leading, from *mener*, to lead, seems also to have influenced the meaning.

MANAGUA, the capital of Nicaragua, and of the department of Managua; on the southern shore of Lake Managua, and on the railway from Diriamba to El Viejo, 65 m. by rail S.E. of the Pacific port of Corinto. Pop. (1905), about 30,000. Managua is a modern city, with many flourishing industries and a rapidly growing population. Its chief buildings are those erected after 1855, when it was chosen as the capital to put an end to the rivalry between the then more important cities of Leon and Granada. They include the Palacio Nacional or government buildings, Corinthian in style, the national library and museum, an ornate Renaissance structure, the barracks and the general post office. Owing to its position on the lake, and its excellent communications by rail and steamer, Managua obtained after 1855 an important export trade in coffee, sugar, cocoa and cotton, although in 1876 it was temporarily ruined by a great inundation.

MANAKIN, from the Dutch word *Manneken*, applied to certain small birds, a name apparently introduced into English by G. Edwards (*Nat. Hist. Birds*, i. 21) in or about 1743, since which time it has been accepted

generally, and is now used for those which form the family *Pipridae*. The manakins are peculiar to the Neotropical Region and have many of the habits of the titmouse family (*Paridae*), living in deep forests, associating in small bands, and keeping continually in motion, but feeding almost wholly on the large soft berries of the different kinds of *Melastoma*. The *Pipridae*, however, have no close affinity with the *Paridae*,[1] but belong to another great division of the order *Passeres*, the *Clamatores* group of the *Anisomyodae*. The manakins are nearly all birds of gay appearance, generally exhibiting rich tints of blue, crimson, scarlet, orange or yellow in combination with chestnut, deep black, black and white, or olive green; and among their most obvious characteristics are their short bill and feeble feet, of which the outer toe is united to the middle toe for a good part of its length. The tail, in most species very short, has in others the middle feathers much elongated, and in one of the outer rectrices are attenuated and produced into threads. They have been divided (Brit. Mus. *Cat. Birds*, vol. xiv.) into nineteen genera with about seventy species, of which eighteen are included under *Pipra* itself. *P. leucilla*, one of the best known, has a wide distribution from the isthmus of Panama to Guiana and the valley of the Amazon; but it is one of the most plainly coloured of the family, being black with a white head. The genus *Machaeropterus*, consisting of four species, is very remarkable for the extraordinary form of some of the secondary wing-feathers in the males, in which the shaft is thickened and the webs changed in shape, as described and illustrated by P. L. Sclater (*Proc. Zool. Society*, 1860, p. 90; Ibis, 1862, p. 175[2]) in the case of the beautiful *M. deliciosus*, and it has been observed that the wing-bones of these birds are also much thickened, no doubt in correlation with this abnormal structure. A like deviation from the ordinary character is found in the allied genus *Chiromachaeris*, comprehending seven species, and Sclater is of the opinion that it enables them to make the singular noise for which they have long been noted, described by O. Salvin (*Ibis*, 1860, p. 37) in the case of one of them, *M. candaei*, as beginning “with a sharp note not unlike the crack of a

whip," which is "followed by a rattling sound not unlike the call of a landrail"; and it is a similar habit that has obtained for another species, *M. edwardsi*, the name in Cayenne, according to Buffon (*Hist. Nat. Oiseaux*, iv. 413), of *Cassenoisette*.

(A. N.)

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1 Though Edwards called the species he figured (*ut supra*) a titmouse, he properly remarked that there was no genus of European birds to which he could liken it.

2 The figures are repeated by Darwin (*Descent of Man*, &c., ii. 66).

MANAOAG, a town in the north central part of the province of Pangasinán, Luzon, Philippine Islands, on the Angalacan river, 21 m. N.E. of Lingayen. Pop. (1903), 16,793. The inhabitants devote themselves especially to rice-culture, though tobacco, Indian corn, sugar-cane, fruit and vegetables are also raised. A statue of the Virgin Mary here is visited annually (especially during May) by thousands from Pangasinán and adjoining provinces. The inhabitants are mostly Ilocanos. Manaoag includes the town proper and eighteen barrios.

MANÁOS, a city and port of Brazil and capital of the state of Amazonas, on the left bank of the Rio Negro 12 m. above its junction with the Solimões, or Amazon, and 908 m. (Wappäus) above the mouth of the latter, in lat. 3° 8′ 4″ S., long. 60° W. Pop. (1908), about 40,000, including a large percentage of Indians, negroes and mixed-bloods; the city is growing rapidly. Manáos stands on a slight eminence overlooking the river, 106 ft. above sea-level, traversed by several "igarapés" (canoe paths) or side channels, and beautified by the luxuriant vegetation of the Amazon valley. The climate is agreeable and healthful, the average temperature for the year (1902) being 84°, the number of rainy days 130, and the total rainfall 66.4 in. Up to the beginning of the 20th century the only noteworthy public edifices were the church of N.S. da Conceição, the St Sebastião asylum and, possibly, a Misericordia hospital; but a government building, a custom-house, a municipal hall, courts of justice, a marketplace and a handsome theatre were subsequently erected, and a modern water-supply system, electric light and electric tramways were provided. The "igarapés" are spanned by a number of bridges. Higher education is provided by a lyceum or high school, besides which there is a noteworthy school (bearing the name of Benjamin Constant) for poor orphan girls. Manáos has a famous botanical garden, an interesting museum, a public library, and a meteorological observatory. The port of Manáos, which is the commercial centre of the whole upper Amazon region, was nothing but a river anchorage before 1902. In that year a foreign corporation began improvements, which include a stone river-wall or quay, storehouses for merchandise, and floating wharves or landing stages connected with the quay by floating bridges or roadways. The floating wharves and bridges are made necessary by the rise and fall of the river, the difference between the maximum and minimum levels being about 33 ft.

The principal exports are rubber, nuts, cacao, dried fish, hides and piassava fibre. The markets of Manáos receive their supplies of beef from

the national stock ranges on the Rio Branco, and it is from this region that hides and horns are received for export. The shipping movement of the port has become large and important, the total arrivals in 1907, including small trading boats, being 1589, of which 133 were ocean-going steamers from Europe and the United States, 75 from south Brazilian ports, and 227 river steamers from Pará. This rapid growth in its direct trade is due to a provincial law of 1878 which authorized an abatement of 3% in the export duties on direct shipments, and a state law of 1900 which made it compulsory to land and ship all products of the state from the Manáos custom-house.

The first European settlement on the site of Manáos was made in 1660, when a small fort was built here by Francisco da Motta Falcão, and was named São José de Rio Negro. The mission and village which followed was called Villa de Barra, or Barra do Rio Negro (the name "Barra" being derived from the "bar" in the current of the river, occasioned by the setback caused by its encounter with the Amazon). It succeeded Barcellos as the capital of the old *capitania* of Rio Negro in 1809, and became the capital of Amazonas when that province was created in 1850, its name being then changed to Manáos, the name of the principal tribe of Indians living on the Rio Negro at the time of its discovery. In 1892 Manáos became the see of the new bishopric of Amazonas.

MANASSAS, a district of Prince William county, Virginia, and a town of the district, about 30 m. W.S.W. of Washington, D.C. Pop. (1910) of

the district, 3381; of the town, 1217. The village of Manassas (in the town), known also as Manassas Junction, is served by the Chesapeake & Ohio and the Southern railways. North of the junction is Bull Run, a small stream which empties into the Occoquan, an arm of the Potomac. In this neighbourhood two important battles of the American Civil War, the first and second battles of Bull Run, were fought on the 21st of July 1861 and on the 29th-30th of August 1862 respectively; by Southern historians these battles are called the battles of Manassas. At Manassas is the Manassas Industrial School for Coloured Youth (non-sectarian; privately supported), which was founded in 1892 and opened in 1894; in 1908-1909 it had nine teachers (all negroes) and 121 pupils, all in elementary grades.

MANASSEH (7th cent. B.C.), son of Hezekiah, and king of Judah (2 Kings xxi. 1-18). His reign of fifty-five years was marked by a reaction against the reforming policy of his father, and his persistent idolatry and bloodshed were subsequently regarded as the cause of the destruction of Jerusalem and of the dispersion of the people (2 Kings xxiii. 26 seq.; Jer. xv. 4). As a vassal of Assyria he was contemporary with Sennacherib, Esar-haddon (681-668 B.C.) and Assur-bani-pal (668-626 B.C.), and his name (*Me-na-si-e*) appears among the tributaries of the two latter. Little is known of his history. The chronicler, however, relates that the Assyrian army took him in chains to Babylon, and that after his repentance he returned, and distinguished himself by his piety, by building operations in Jerusalem and by military organization (2 Chron. xxxiii. 10 sqq.). The story of his

penitence referred to in xxxiii. 22, is untrustworthy, but the historical foundation may have been some share in the revolt of the Babylonian Samas-sum-ukin (648 B.C.), on which occasion he may have been summoned before Assur-bani-pal with other rebels and subsequently reinstated. See further Driver, in Hogarth, *Authority and Archaeology*, pp. 114 sqq. Manasseh was succeeded by his son Amon, who after a brief reign of two years perished in a conspiracy, his place being taken by Amon's son (or brother) Josiah (*q.v.*). A lament formerly ascribed to Manasseh (cf. 2 Chron. xxxiii. 18) is preserved in the Apocrypha (see MANASSES, PRAYER OF; and APOCRYPHAL LITERATURE). On Judg. xviii. 30 (marg.), see JONATHAN.

MANASSEH (apparently Hebrew for "he who causes to forget," but see H. W. Hogg, *Encyc. Bib.*, *s.v.*); in the Bible, a tribe of Israel, the elder but less important of the "sons" of Joseph. Its seat lay to the north of Ephraim, but its boundaries can scarcely be defined. It merged itself with its "brother" in the south, and with Issachar, Zebulun and other tribes in the north (Josh. xvii. 7 sqq.). From the latter it was separated for a time by a line of Canaanite cities extending from Dor to Bethshean, which apparently were not all subdued till the days of David or Solomon (Judg. i. 27; 1 Sam. xxxi. 10; 1 Kings ix. 15). Besides its western settlement in the fertile glades of northern Samaria, running out into the great plain, there were territories east of the Jordan reckoned to Manasseh. Gilead and Bashan were said to have been taken by Machir, and a number of places of uncertain identification were occupied by Nobah and Jair (Num. xxxii. 41; Judg. x. 3-5). It seems

most natural to suppose that these districts were held before the Israelites crossed over to the west (cf. the tradition Num. xxi., Deut. iii.). On the other hand, in Judg. v. 14, Machir may conceivably belong to the west, and it is possible that, according to another tradition, these movements were the result of the complaint of the Joseph tribes that their original territory was too restricted.[1] In the genealogical lists, Machir, perhaps originally an independent branch, is the eldest son of Manasseh (Josh. xvii. 1 *b*, 2); but according to later schemes he is Manasseh's only son (Num. xxvi. 28-34). Intermixture with Arameans is indicated in the view that he was the son of Manasseh and an Aramean concubine (1 Chron. vii. 14), and this is supported by the statement that the Arameans of Geshur and Maacah (cf. 2 Sam. x. 6; Gen. xxii. 24) dwelt among the Israelites of eastern Jordan (Josh. xiii. 13). Subsequently, at an unknown period of history, sixty cities were lost (1 Chron. ii. 23). The story of the daughters of the Manassite Zelophehad is of interest for the Hebrew law of inheritance (Num. xxvii. 1-11, xxxvi.).

Some details of the history of this twofold branch of the Israelites are contained in the stories of Gideon (W. Manasseh) and Jephthah (E. Manasseh). The relations between Saul and Jabesh-Gilead point to the close bond uniting the two districts, but the details have been variously interpreted: Winckler, for example, suggesting that Saul himself was originally from E. Manasseh and that he followed in the steps of Jephthah (*Keilinschr. u. d. alte Test.*, pp. 216 seq. 227). Generally speaking, its position in the west made it share the fortunes of Ephraim, whilst on the east the proximity of Ammonites and Moabites controlled its history; see also the articles on its southern neighbours, Gad and Reuben, and the articles Genealogy (Biblical); and Jews: *History*.

(S. A. C.)

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1 So Budde (*Richter u. Samuel*), who recovers certain old fragments and arranges Josh. xvii. 14-18 (v. 18 read "hill-country of Gilead"); Num. xxxii. 39, 41 seq.; Josh. xiii. 13.

MANASSES, CONSTANTINE, Byzantine chronicler, flourished in the 12th century during the reign of Manuel I. (Comnenus) (1143-1180). He was the author of a *Chronicle* or historical synopsis of events from the creation of the world to the end of the reign of Nicephorus Botaniates (1081), written by direction of Irene, the emperor's sister-in-law. It consists of about 7000 lines in the so-called "political" metre.[1] There is little to be said of it, except that it is rather more poetical than the iambic chronicle of Ephraim (about 150 years later). It obtained great popularity and appeared in a free prose translation; it was also translated into Slavonic. The poetical romance of the *Loves of Aristander and Callithea*, also in "political" verse, is only known from the fragments preserved in the Ῥοδωνία (rose-garden) of Macarius Chrysocephalus (14th century). Manasses also wrote a short biography of Oppian, and some descriptive pieces (all except one unpublished) on artistic and other subjects.

EDITIONS.—*Chronicle* in Bonn, *Corpus scriptorum hist. Byz.*, 1st ed. Bekker (1837) and in J. P. Migne, *Patrologia graeca*, cxxvii.; *Aristander and Callithea* in R. Hercher's *Scriptores erotici graeci*, ii. (1859); "Life of Oppian" in A. Westermann, *Vitarum scriptores graeci minores* (1845). A long didactic poem in "political" verse (edited by E. Miller in *Annuaire de l'assoc. pour l'encouragement des études grecques en France*, ix. 1875) is attributed to Manasses or one of his imitators. See also F. Hirsch, *Byzantinische Studien* (1876); C. Krumbacher, *Geschichte der byzantinischen Litteratur* (1897).

1 “Political” verse or metre is the name given to a kind of verse found as early as the 6th century in proverbs, and characteristic of Byzantine and modern Greek poetry. It takes no account of the quantity of syllables; the scansion depends on accent, and there is always an accent on the last syllable but one. It is specially used of an iambic verse with fifteen syllables, *i.e.* seven feet and an unaccented syllable over. Byron compares “A captain bold of Halifax who lived in country quarters.” Such facile metres are called “political,” in the sense of “commonplace,” “of the city.” Cf. Gibbon’s *Decline and Fall* (ed. Bury, 1898), vi. 108; Du Cange, *Gloss. med. et infin. lat.* (vi. 395), who has an interesting quotation from Leo Allatius. Leo explains “political” as implying that the verses are “scorta et meretrices, quod omnibus sunt obsequiosae et peculiares, et servitutem publicam serviunt.”

MANASSES, PRAYER OF,

an apocryphal book of the Old Testament. This writing, which since the Council of Trent has been relegated by the Church of Rome to the position of an appendix to the Vulgate, was placed by Luther and the translators of the English Bible among the apocryphal books. In some MSS. of the Septuagint it is the eighth among the canticles appended to the Psalter, though in many Greek psalters, which include the canticles, it is not found at all. In Swete’s Old Testament in Greek, iii. 802 sqq., A is printed with the variants of T (*Psalterium turicense*).1 From the statements in 2 Chron. xxxiii. 12, 13, 18, 19, it follows that the Old Testament chronicler found a prayer attributed to Manasseh in his Hebrew sources, *The History of the Kings of Israel* and *The History of the Seers*. Naturally the question arose, had the existing Prayer of Manasses any direct connexion with the prayer referred to by the chronicler? Ewald was of opinion that the Greek was an actual translation of the lost Hebrew; but Ball more wisely takes it as a free rendering of a lost Haggadic narrative

founded on the older document from which the chronicler drew his information. This view he supports by showing that there was once a considerable literature in circulation regarding Manasseh's later history. On the other hand most scholars take the Prayer to have been written in Greek, *e.g.* Fritzsche, Schürer and Ryssel (Kautzsch, *Apok. u. Pseud.* i. 165-168).

This fine penitential prayer seems to have been modelled after the penitential psalms. It exhibits considerable unity of thought, and the style is, in the main, dignified and simple.

As regards the date, Fritzsche, Ball and Ryssel agree in assigning this psalm to the Maccabean period. Its eschatology and doctrine of "divine forgiveness" may point to an earlier date.

The best short account of the book is given by Ball (*Speaker's Apocrypha*, ii. 361-371); see also Porter in Hastings's *Dict. Bible*, iii. 232-233.

(R. H. C.)

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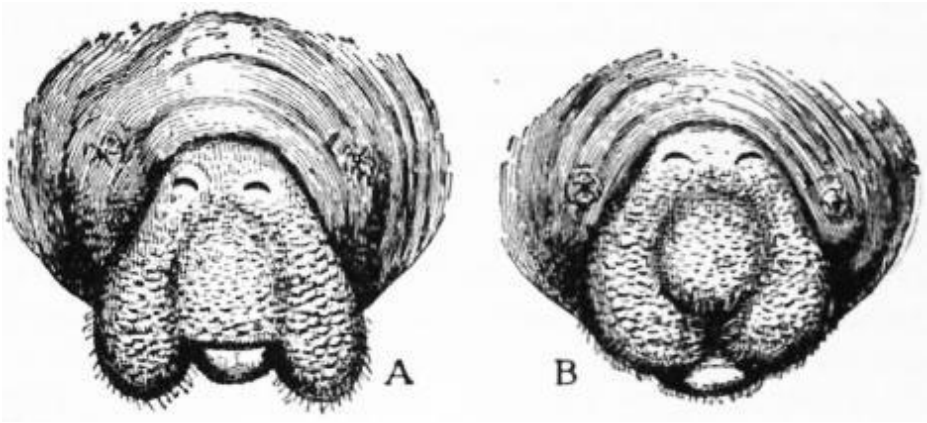
1 Nestle (*Septuaginta Studien III.*) contends that the text of A and T is derived from the Apost. Const. ii. 22, or from its original, and not from a MS. of the Septuagint.

MANATI (often anglicized as "manatee"), the name, adapted from the Carib *manattouï*, given by the Spanish colonists of the West Indies to the American representative of a small group of herbivorous aquatic mammals, constituting, with their allies the dugong and the now extinct *Rhytina*, the

order Sirenia. The name, though possibly of Mandingo origin (see MANDINGO), was latinized as *manatus*, furnished with hands, thus referring the etymology to the somewhat hand-like form, or hand-like use, of the fore-flippers, which alone serve these creatures for limbs. Manatis, as shown in the illustration in the article SIRENIA, are somewhat whale-like in shape, having a similar horizontally expanded tail-fin; but here the resemblance to the Cetacea ceases, the whole organization of these animals being constructed on entirely different lines. The American manati, *Manatus* (or, as some would have it, *Trichechus latirostris*), inhabits the rivers of Florida, Mexico, Central America and the West Indies, and measures from 9 to 13 feet in length. The body is somewhat fish-like, but depressed and ending posteriorly in a broad, flat, shovel-like horizontal tail, with rounded edges. The head is of moderate size, oblong, with a blunt, truncated muzzle, and divided from the body by a slight constriction or neck. The fore limbs are flattened oval paddles, placed rather low on the sides of the body, and showing externally no signs of division into fingers, but with three diminutive flat nails near their extremities. No traces of hind limbs are discernible either externally or internally; and there is no dorsal fin. The mouth is peculiar, the tumid upper lip being cleft in the middle line into two lobes, each of which is separately movable. The nostrils are two semilunar valve-like slits at the apex of the muzzle. The eyes are very minute, placed at the sides of the head, and with a nearly circular aperture with wrinkled margins; and external ears are wanting. The skin generally is of a dark greyish colour, not smooth or glistening like that of whale or dolphin, but finely wrinkled. At a little distance it appears naked, but close inspection, at all events in young animals, shows a scanty covering of delicate hairs, and both upper and under lips are supplied with short, stiff bristles.



(From Murie.)

Front view of head of American Manati, showing the eyes, nostrils, and mouth. A, with the lobes of the upper lip divaricated; B, with the lip contracted.

Manatis have a number—as many as 20 pairs in each jaw—of two-ridged teeth, of which, however, but comparatively few are in use at once. They lack the large tusks of the male dugong, and the fore part of the skull is not so much bent down as in that animal. In life the palate has a horny plate, with a similar one in the lower jaw. The skeleton is described under SIRENIA.

Manatis pass their life in the water, inhabiting bays, lagoons, estuaries and large rivers, but the open sea is unsuited to their peculiar mode of life. As a rule they prefer shallow water, in which, when not feeding, they lie near the bottom. In deeper water they often float, with the body much arched, the rounded back close to the surface, and the head, limbs and tail hanging downwards. The air in the lungs assists them to maintain this position. Their food consists exclusively of aquatic plants, on which they feed beneath the water. They are slow in their movements, and perfectly harmless, but are subject to persecution for the sake of their oil, skin and flesh. Frequent attempts have been made to keep specimens alive in captivity, and sometimes with considerable success, one having lived in the Brighton Aquarium for upwards of sixteen months. From such captive specimens certain observations on the mode of life of these animals have been made.

We learn, for instance, that from the shoulder-joint the flippers can be moved in all directions, and the elbow and wrist permit of free extension and flexion. In feeding, manatis push the food towards their mouths by means of one of the hands, or both used simultaneously, and any one who has seen these members thus employed can believe the stories of their carrying their young under their arms. Still more interesting is the action of the peculiar lateral pads formed by the divided upper lip, thus described by Professor A. Garrod: “These pads have the power of transversely approaching towards and receding from one another simultaneously (see fig.). When the animal is on the point of seizing (say) a leaf of lettuce, the pads are diverged transversely in such a way as to make a median gap of considerable breadth. Directly the leaf is within grasp the lip-pads are approximated, the leaf is firmly seized between their contiguous bristly surfaces, and then drawn inwards by a backward movement of the lower margin of the lip as a whole.” The animal is thus enabled by the unaided means of the upper lip to introduce food placed before it without the assistance of the comparatively insignificant lower lip, the action recalling that of the mouth of the silkworm and other caterpillars in which the mandibles diverge and converge laterally during mastication. All trustworthy observations indicate that the manati has not the power of voluntarily leaving the water. None of the specimens in confinement has been observed to emit any sound.

The Amazonian manati (*M. inunguis*) is a much smaller species, not exceeding 7 or 8 ft. in length, and without nails to the flippers. It ascends most of the tributaries of the Amazon until stopped by rapids. From a specimen which lived a short time in London it appears that the lip-pads are less developed than in the northern species. The third species is the West African *M. senegalensis*, which extends a distance of about ten degrees south and sixteen north of the equator, and ranges into the heart of the continent as far as Lake Tchad. From 8 to 10 ft. appears to be the normal

length; the weight of a specimen was 590 lb. The colour is bluish black, with a tinge of olive-green above and yellow below.

(R. L.*)

MANBHUM, a district of British India, in the Chota Nagpur division of Bengal. The administrative headquarters are at Purulia. Area, 4147 sq. m.; pop. (1901), 1,301,364, showing an increase of 9.1% since 1891. Manbhum district forms the first step of a gradual descent from the table-land of Chota Nagpur to the delta of lower Bengal. In the northern and eastern portions the country is open, and consists of a series of rolling downs dotted here and there with isolated conical hills. In the western and southern tracts the country is more broken and the scenery much more picturesque. The principal hills are Dalma (3407 ft.), the crowning peak of a range of the same name; Gangabari or Gajboro (2220 ft.), the highest peak of the Baghmundi range, about 20 m. south-west of Purulia; and Panchkot or Panchet (1600 ft.), on which stands the old fort of the rajas of Panchet. The hills are covered with dense jungle. The chief river is the Kasai, which flows through the district from north-west to south-east into Midnapore, and on which a considerable floating trade in *sal* timber is carried on. The most numerous aboriginal tribe are the Sontals; but the Bhumij Kols are the characteristic race. In Manbhum they inhabit the country lying on both sides of the Subanrekha. They are pure Mundas, but their compatriots to the east have dropped the title of Munda and the use of their distinctive language, have adopted Hindu customs, and are fast becoming Hindus in religion. The

Bhumij Kols of the Jungle Mahals were once the terror of the surrounding districts; they are now more peaceful.

Three principal crops of rice are grown, one sown broadcast early in May on table-lands and the tops of ridges, an autumn crop, and a winter crop, the last forming the chief harvest of the district. Other crops are wheat, barley, Indian corn, pulses, oilseeds, linseeds, jute, hemp, sugar-cane, indigo, pan and tobacco. Owing to the completeness of the natural drainage, floods are unknown, but the country is liable to droughts caused by deficient rainfall. The principal articles of export are oilseeds, pulses, *ghi*, lac, indigo, tussur silk (manufactured near Raghunathpur), timber, resin, coal, and (in good seasons) rice. The chief imports are salt, piece goods, brass utensils and unwrought iron. Cotton hand-loom weaving is carried on all over the district. Manbhum contains the Jherria coalfield, in the Damodar valley, where a large number of mines have been opened since 1894. The United Free Church of Scotland has a mission at Pakheria, with a printing press that issues a monthly journal in Sonthali; and a German Lutheran mission has been established since 1864. The district is traversed by the Bengal-Nagpur railway, while two branches of the East Indian railway serve the coalfield.

MANCHA, LA

(Arabic, *Al Mansha*, "the dry land" or "wilderness"), a name which when employed in its widest sense denotes the bare and monotonous elevated plateau of central Spain that stretches between the mountains of Toledo and the western spurs of the hills of

Cuenca, being bounded on the S. by the Sierra Morena and on the N. by the Alcarria region. It thus comprises portions of the modern provinces of Toledo, Albacete and Cuenca, and the greater part of Ciudad Real. Down to the 16th century the eastern portion was known as La Mancha de Montearagon or de Aragon, and the western simply as La Mancha; afterwards the north-eastern and south-western sections respectively were distinguished by the epithets *Alta* and *Baja* (upper and lower). La Mancha is famous as the scene of Cervantes' novel *Don Quixote*; in appearance, with its multitude of windmills and vast tracts of arid land, it remains almost exactly as Cervantes described it. Many villages, such as El Toboso and Argamasilla de Alba, both near Alcázar de San Juan, are connected by tradition with episodes in *Don Quixote*.

MANCHE, a department of north-western France, made up chiefly of the Cotentin and the Avranchin districts of Normandy, and bounded W., N. and N.E. by the English Channel (Fr. *La Manche*), from which it derives its name, E. by the department of Calvados, S.E. by Orne, S. by Mayenne and Ille-et-Vilaine. Pop. (1906), 487,443. Area, 2475 sq. m.

The department is traversed from south to north by a range of hills, in many parts picturesque, and connected in the south with those of Maine and Brittany. In the country round Mortain, which has been called the Switzerland of Normandy, they rise to a height of 1200 ft. The coast-line, running northward along the bay of the Seine from the rocks of Grand Camp to Cape Barfleur, thence westward to Cape la Hague, and finally southward

to the Bay of Mont St Michel, has a length of 200 miles. The Vire and the Taute (which near the small port of Carentan receives the Ouve as a tributary on the left) fall into the sea at the Calvados border, and are united by a canal some miles above their mouths. From the mouth of the Taute a low beach runs to the port of St Vaast-la-Hougue, where the coast becomes rocky, with sandbanks. Off St Vaast lies the fortified island of Tatihow, with the laboratory of marine zoology of the Natural History Museum of Paris. Between Cape Barfleur and Cape la Hague lie the roads of Cherbourg, protected by the famous breakwater. The whole western coast is inhospitable; its small havens, lying behind formidable barriers and reefs, are almost dry at low tide. Great cliffs, such as the points of Jobourg (420 ft. high) and Flamanville, alternate with long strands, such as that which extends for 30 m. from Cape Carteret to Granville. Between this coast and the Channel Islands the tide, pent up between numerous sandbanks, flows with a terrific force that has given these passages such ill-omened names as *Passage de la Déroute* and the like. The only important harbours are Granville and the haven of refuge of Diélette between Granville and Cherbourg. Carteret carries on a passenger traffic with the Channel Islands. The chief stream is the Sienne, with its tributary the Soulle flowing by Coutances. South of Granville the sands of St Pair are the commencement of the great bay of Mont Saint Michel, whose area of 60,000 acres was covered with forest till the terrible tide of the year 709. The equinoctial tides reach a vertical height of nearly 50 ft. In the bay the picturesque walls of the abbey rise from the summit of a rock 400 ft. high. The Sée, which waters Avranches, and the Couesnon (separating Manche from Ille-et-Vilaine) disembogue in the bay.

The climate of Manche is mild and humid, from its propinquity to the sea. Frosts are never severe; myrtles and fuchsias flourish in the open air. Excessive heat is also unusual; the predominant winds are south-west.

The characteristic industry of the department is the rearing of horses and cattle, carried on especially in the rich meadow of the eastern Cotentin; sheep are raised in the western arrondissement of Coutances. Wheat, buckwheat, barley and oats are the chief cereals cultivated. Manche is one of the foremost departments for the production of cider-apples and pears; plums and figs are also largely grown. Butter is an important source of profit, as also are poultry and eggs. Flourishing market-gardens are found in the west. The department contains valuable granite quarries in the Cherbourg arrondissement and the Chausey islands; building and other stone is quarried.

Villedieu manufactures copper-ware and Sourdeval iron and other metal-ware; and there are wool-spinning mills, paper-works and leather-works, but the department as a whole is industrially unimportant. There are oyster-beds on the coast (St Vaast, &c.), and the maritime population, besides fishing for herring, mackerel, lobsters or sole, collect seaweed for agricultural use. Coutances is the seat of a bishopric of the province of Rouen. The department forms part of the region of the X. army corps and of the circumscriptions of the académie (educational division) and appeal-court of Caen. Cherbourg (*q.v.*), with its important port, arsenal and shipbuilding yards, is the chief centre of population. St Lô (*q.v.*) is the capital; there are six arrondissements (St Lô, Avranches, Cherbourg, Coutances, Mortain, Valognes), with 48 cantons and 647 communes. Avranches, Mortain, Coutances, Granville and Mont Saint Michel receive separate treatment. At Lessay and St Sauveur-le-Vicomte there are the remains of ancient Benedictine abbeys, and Torigni-sur-Vire and Tourlaville (close to Cherbourg) have interesting châteaux of the 16th century. Valognes, which in the 17th and 18th centuries posed as a provincial centre of culture, has a church (15th, 16th and 17th centuries) remarkable for its dome, the only one of Gothic architecture in France.

MANCHESTER, EARLS AND DUKES OF. The Manchester title, in the English peerage, belongs to a branch of the family of Montagu (*q.v.*). The first earl was Sir Henry Montagu (*c.* 1563-1642), grandson of Sir Edward Montagu, chief justice of the king's bench 1539-1545, who was named by King Henry VIII. one of the executors of his will, and governor to his son, Edward VI. Sir Henry Montagu, who was born at Boughton, Northamptonshire, about 1563, was educated at Christ's College, Cambridge, and, having been called to the bar, was elected recorder of London in 1603, and in 1616 was made chief justice of the king's bench, in which office it fell to him to pass sentence on Sir Walter Raleigh in October 1618. In 1620 he was appointed lord high treasurer, being raised to the peerage as Baron Montagu of Kimbolton, Huntingdonshire, and Viscount Mandeville. He became president of the council in 1621, in which office he was continued by Charles I., who created him earl of Manchester[1] in 1626. In 1628 he became lord privy seal, and in 1635 a commissioner of the treasury. Although from the beginning of his public life in 1601, when he first entered parliament, Manchester had inclined to the popular side in politics, he managed to retain to the end the favour of the king. He was a judge of the Star Chamber, and one of the most trusted councillors of Charles I. His loyalty, ability and honesty were warmly praised by Clarendon. In conjunction with Coventry, the lord keeper, he pronounced an opinion in favour of the legality of ship-money in 1634. He died on the 7th of November 1642. Manchester was married three times. One of his sons by

his third wife was father of Charles Montagu, created earl of Halifax in 1699.

EDWARD MONTAGU, 2nd earl of Manchester (1602-1671), eldest son of the 1st earl by his first wife, Catherine Spencer, granddaughter of Sir John Spencer of Althorpe, was born in 1602, and was educated at Sidney Sussex College, Cambridge. He was member of parliament for Huntingdonshire 1623-1626, and in the latter year was raised to the peerage in his father's lifetime as Baron Montagu of Kimbolton, but was known generally by his courtesy title of Viscount Mandeville. His first wife, who was related to the duke of Buckingham, having died in 1625 after two years of marriage, Mandeville married in 1626 Anne, daughter of the 2nd earl of Warwick. The influence of his father-in-law, who was afterwards admiral on the side of the parliament, drew Mandeville to the popular side in the questions in dispute with the crown, and at the beginning of the Long Parliament he was one of the recognized leaders of the popular party in the upper House, his name being joined with those of the five members of the House of Commons impeached by the king in 1642. At the outbreak of the Civil War, having succeeded his father in the earldom in November 1642, Manchester commanded a regiment in the army of the earl of Essex, and in August 1643 he was appointed major-general of the parliamentary forces in the eastern counties, with Cromwell as his second in command. Having become a member of the "committee of both kingdoms" in 1644, he was in supreme command at Marston Moor (July 1, 1644); but in the subsequent operations his lack of energy brought him into disagreement with Cromwell, and in November 1644 he strongly expressed his disapproval of continuing the war (see CROMWELL, OLIVER). Cromwell brought the shortcomings of Manchester before parliament in the autumn of 1644; and early in the following year, anticipating the self-denying ordinance, Manchester resigned his command. He took a leading part in the frequent negotiations for an arrangement with Charles, was custodian with Lenthall of the great seal

1646-1648, and frequently presided in the House of Lords. He opposed the trial of the king, and retired from public life during the Commonwealth; but after the Restoration, which he actively assisted, he was loaded with honours by Charles II. In 1667 he was made a general, and he died on the 5th of May 1671. Manchester was made a K.G. in 1661, and became F.R.S. in 1667. Men of such divergent sympathies as Baxter, Burnet and Clarendon agreed in describing Manchester as a lovable and virtuous man, who loved peace and moderation both in politics and religion. He was five times married, leaving children by two of his wives, and was succeeded in the title by his eldest son, Robert, 3rd earl of Manchester (1634-1683).

See Lord Clarendon, *History of the Rebellion and Civil Wars in England* (7 vols., Oxford, 1839) and *Life of Clarendon* (Oxford, 1827); S. R. Gardiner, *History of the Great Civil War*, 1642-1649. (4 vols., London, 1886-1891); *The Quarrel between Manchester and Cromwell*, Camden Soc., N.S. 12 (London, 1875); Sir Philip Warwick, *Memoirs of the Reign of Charles I.* (London, 1701).

CHARLES MONTAGU, 1st duke of Manchester (*c.* 1656-1722), son of Robert, 3rd earl of Manchester, was educated at Trinity College, Cambridge, and succeeded to his father's earldom in 1683. Warmly sympathizing with the Whig revolution of 1688, he attended William and Mary at their coronation, fought under William at the Boyne, became a privy councillor in 1698, and held various important diplomatic posts between that date and 1714, when he received an appointment in the household of George I., by whom on the 28th of April 1719 he was created duke of Manchester. He died on the 20th of January 1722, and was succeeded successively in the dukedom by his two sons, William 2nd duke of Manchester (1700-1739), and Robert 3rd duke (*c.* 1710-1762), who was vice-chamberlain to Queen Caroline, wife of George II.

GEORGE MONTAGU, 4th duke of Manchester (1737-1788), was the son of Robert, the 3rd duke. He was a supporter of Lord Rockingham, and an active opponent in the House of Lords of Lord North's American policy. In the Rockingham ministry of 1782 Manchester became lord chamberlain. He died in September 1788.

WILLIAM MONTAGU, 5th duke of Manchester (1768-1843), second son of the preceding, was educated at Harrow, and having become a colonel in the army in 1794, was appointed governor of Jamaica in 1808. Here he remained, except for a visit to England (1811-1813) till 1827, administering the colony with ability in a period of considerable difficulty, and doing much to prepare the way for emancipation of the slaves. From 1827 to 1830 he was postmaster-general in the cabinet of the duke of Wellington, and died in Rome on the 18th of March 1843. His wife was Susan, daughter of the 4th duke of Gordon. He was succeeded by his son George, 6th duke (1799-1855), a captain in the navy; whose son William Drogo, 7th duke (1823-1890), married Louise, daughter of the Comte d'Alten of Hanover, who after his death married Spencer Cavendish, 8th duke of Devonshire. William was succeeded by his son George Victor Drogo, 8th duke of Manchester (1853-1892), on whose death the title devolved on his son, William Angus Drogo, 9th duke of Manchester (b. 1877).

(R. J. M.)

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1 The title was derived, not from Manchester in Lancashire, but from Manchester (or Godmanchester) in Huntingdonshire, where the Montagu family estates were.

MANCHESTER, a township of Hartford county, Connecticut, U.S.A., about 9 m. E. of Hartford. Pop.(1890), 8222; (1900), 10,601, of whom 3771 were foreign-born; (1910 census) 13,641. Manchester is served by the New York, New Haven & Hartford railway and by electric line connecting with Hartford, Rockville and Stafford Springs. The township covers an area of about 28 sq. m., and includes the villages of Manchester, South Manchester, Buckland, Manchester Green and Highland Park. The Hockanum River provides a good water power, and Manchester has various manufactures. At South Manchester, an attractive industrial village, a silk mill was built in 1838; the silk mills of one firm (Cheney Brothers) here cover about 12 acres; the company has done much for its employees, whose homes are almost all detached cottages in attractive grounds. Manchester was originally a part of the township of Hartford, and later a part of the township of East Hartford. The first settlement within its present limits was made about 1672; the land was bought from the Indians in 1676; and the township was separated from East Hartford and incorporated in 1823.

See also Meakin's *Model Factories and Villages* (1905).

MANCHESTER, a city and county of a city, municipal, county and parliamentary borough of Lancashire, England, 189 m. N.W. by N. of London, and 31 m. E. by N. of Liverpool. It stands for the most part on a level plain, the rising ground being chiefly on the north side. The rivers are the Irwell, the Medlock, the Irk, and the Tib, the last entirely overarched and

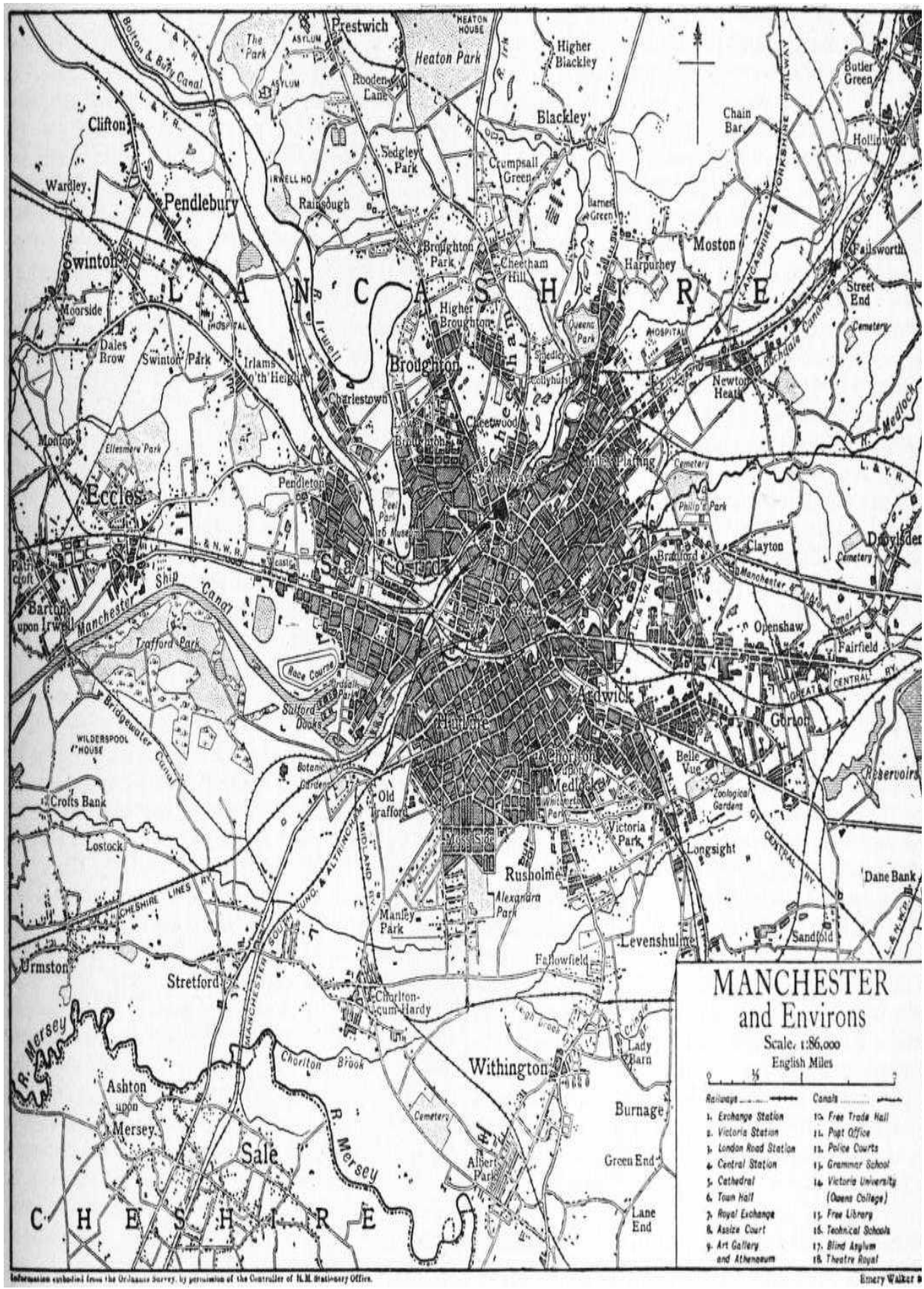
covered by streets and warehouses. The Irwell, which separates Manchester from Salford, is crossed by a series of bridges and discharges itself into the Mersey, which is about 10 m. distant. The chief part of the district, before it was covered with the superficial drift of sand, gravel and clay, consisted of upper New Red Sandstone with slight portions of lower New Red Sandstone, magnesian marls and upper red marls, hard sandstone and limestone rock, and cold clays and shales of contiguous coal-fields. The city, as its thousands of brick-built houses show, has been for the most part dug out of its own clay-fields. The parliamentary and municipal boroughs of Manchester are not conterminous. The city boundaries, which in 1841 enclosed 4293 acres, have been successively enlarged and now enclose 19,914 acres.

There are four large stations for the Lancashire & Yorkshire, London & North-Western, the Midland, Cheshire lines, Great Northern, and Great Central railways, and many subsidiary stations for local traffic. Tramways, as well as railways, run from Manchester to Oldham, Ashton, Eccles, Stockport, &c., with which places the city is connected by continuous lines of street. The length of the streets in the city of Manchester is 758 m. (exclusive of those in the district of Withington, which joined the city in 1905). The tramway lines within the city boundaries extend to 111 m., and in addition there are 58 m. leased to the corporation by adjacent local authorities. As a matter of fact, the whole of south-east Lancashire and some portions of Cheshire are linked to Manchester by railways and tramways so as to form one great urban area, and the traveller passes from one town to another by lines of street which, for the most part, are continuous. Facility of communication is essential to the commercial prosperity of Manchester, and its need was recognized by the duke of Bridgewater, whose canal, constructed in 1761, has now been absorbed by the Manchester Ship Canal (*q.v.*). The making of this early waterway was an event only less important than the opening of the Manchester & Liverpool railway in 1830.

The township of Manchester, which forms the nucleus of the city, is comparatively small, and outlying hamlets having been added, its size has increased without regularity of plan. Roughly speaking, the city forms a square, with Market Street as its central thoroughfare. The tendency of recent development is to reduce the irregularities so that the other main streets may either run parallel to or intersect Market Street. Deansgate, which formerly ended in a narrow tangle of buildings, is now a broad road with many handsome buildings, and the same process of widening, enlarging and rebuilding is going on, more or less, all over Manchester. Market Street, which has not been widened since 1820, has been termed, and with some reason, "the most congested street in Europe"; but relief is anticipated from some of the other street improvements. The centre of the city is occupied by business premises; the factories and workshops are mainly on the eastern side. The most important of the public buildings are in the centre and the south. The latter is also the most favoured residential district, and at its extremity is semi-rural in character. Large masses of the population live beyond the city boundary and come to their daily avocations by train and tram. Such a population is rarely homogeneous and Manchester attracts citizens from every part of the globe; there are considerable numbers of German, Armenian and Jewish residents. The houses are for the most part of brick, the public buildings of stone, which is speedily blackened by the smoky atmosphere. Many of the warehouses are of considerable architectural merit, and in recent years the use of terra-cotta has become more common. It is only in the suburbs that gardens are possible; the air is laden with black dust, and the rivers, in spite of all efforts, are in the central part of the city mere dirty ditches. It is impossible to describe Manchester in general terms, for within the city boundaries the conditions vary from the most squalid of slums to suburban and almost rural beauty.

Churches.—Manchester is the seat of an Anglican bishopric, and the chief ecclesiastical building is the cathedral, which, however, was built simply as

a parish church, and, although a fine specimen of the Perpendicular period, is by no means what might be expected as the cathedral of an important and wealthy diocese. In the course of restoration a piece of Saxon sculpture came to light. This "Angel stone" represents a winged figure with a scroll inscribed *In manus tuas Domine* in characters of the 8th century. The bulk of the building belongs to the early part of the 15th century. The first warden was John Huntington, rector of Ashton, who built the choir. The building, which was noticed for its hard stone by Leland when he visited the town, did not stand time and weather well, and by 1845 some portions of it were rapidly decaying. This led to its restoration by James P. Holden. By 1868 the tower was almost completely renovated in a more durable stone. Further restoration was carried out by J. S. Crowther, and the addition of a porch and vestries was executed by Basil Champneys. The total length is 220 ft. and the breadth 112 ft. There are several stained-glass windows, including one to the memory of "Chinese Gordon." The recumbent statues of Bishop James Fraser and of Hugh Birley, M.P., should also be named. In the Ely chapel is the altar tomb of Bishop James Stanley. In the stalls there are some curious *miserere* carvings. The tower is 139 ft. high, and contains a peal of ten bells, chiefly from the foundry of the Rudhalls. There are two organs, one by Father Smith, and a modern one in an oak case designed by Sir G. Scott. The parish church was made collegiate in 1422, and when in 1847 the bishopric of Manchester was created the warden and fellows became dean and canons and the parish church became the cathedral. The first bishop was James Prince Lee, who died in 1869; the second was James Fraser, who died in 1885; the third was James Moorhouse, who resigned in 1903 and was succeeded by Edmund Arbuthnott Knox. The church endowments are considerable and have been the subject of a special act of parliament, known as the Manchester Rectory Division Act of 1845, which provides £1500 per annum for the dean and £600 to each of the four canons, and divides the residue among the incumbents of the new churches formed out of the old parish.


MANCHESTER
and Environs
Scale, 1:86,000
English Miles
Railways
Canals
1. Exchange Station
2. Victoria Station
3. London Road Station
4. Central Station
5. Cathedral
6. Town Hall
7. Royal Exchange
8. Assize Court
9. Art Gallery and Athenæum
10. Free Trade Hall
11. Post Office
12. Police Courts
13. Grammar School
14. Victoria University (Owens College)
15. Free Library
16. Technical Schools
17. Blind Asylum
18. Theatre Royal
LANCASHIRE
CHESHIRE
Manchester Ship Canal
Bridgewater Canal
Bolton & Bury Canal
R. Irwell
R. Mersey
R. Medlock
Prestwich
Clifton
Pendlebury
Swinton
Moorside
Dales Brow
Swinton Park
Irlams o'th' Height
Wardley
Rainsough
Sedgley Park
Heaton Park
Higher Blackley
Blackley
Crumpsall Green
Broughton Park
Cheetham Hill
Broughton
Higher Broughton
Charlestown
Lower Broughton
Cheetwood
Harpurhey
Moston
Chain Bar
Butler Green
Hollinwood
Failsworth
Street End
Newton Heath
Ashton Canal
Oldham
Eccles
Pendleton
Salford
Manchester
Clayton
Bradford
Openshaw
Fairfield
Gorton
Reddish
Levenshulme
Longsight
Dane Bank
Sandfold
Belle Vue
Zoological Gardens
Reservoirs
Hulme
Chorlton upon Medlock
Old Trafford
Moss Side
Victoria Park
Rusholme
Alexandra Park
Manley Park
Fallowfield
Withington
Lady Barn
Burnage
Green End
Lane End
Albert Park
Cemetery
Chorlton Brook
Stretford
Urmston
Ashton upon Mersey
Sale
Lostock
Crofts Bank
Barton upon Irwell
Trafford Park
Race Course
Salford Docks
Botanic Gardens
Wilderspool House
Ellesmere Park
Moston
Pendleton
Peel Park
Museum
Philip's Park
Queens Park
Hospital
Irwell Ho
Asylum
The Park
Rodeen Lane
Barnes Green
Collyhurst
Shudehill
Cemetery
Manchester South Jun. & Altrincham Railway
Cheshire Lines Railway
Midland Railway
Great Central Railway
L. & Y. R.
L. & N. W. R.
Information extracted from the Ordnance Survey, by permission of the Controller of H.M. Stationery Office.
Emery Walker

Of the Roman Catholic churches that of the Holy Name, which belongs to the Jesuits, is remarkable for its costly decoration. The Greek Church and most of the Nonconformist bodies have places of worship. There are twelve Jewish synagogues. The meeting-house of the Society of Friends is said to be the largest of the kind in the kingdom and will seat 1200 persons.

Public Buildings.—The Royal Infirmary, founded in 1752, having become inadequate for its purposes, a new building has been erected on the south side of the city near the university, from designs by Edwin T. Hall and John Brooke; it was opened in 1909 by king Edward VII. The central site in Piccadilly thus became available for other purposes, and the corporation gave instructions for plans to be made for a new library and art gallery. The art gallery already existing in 1909 was founded as the Royal Institution, but in 1882 passed under the control of the city council. The building was designed by Sir Charles Barry. The collection contains some fine paintings by Etty, Millais, Leighton and other artists. The sculpture includes casts of the Elgin marbles and a statue of Dr John Dalton by Chantrey. The most striking of the public buildings is the town hall, probably the largest municipal building in the country, but no longer entirely adequate to the increasing business of the city council. It was completed in 1877 from designs by Alfred Waterhouse, who selected as the style of architecture a form of Gothic, but treated it very freely as purposes of utility required. The edifice covers 8000 sq. yds., and includes more than two hundred and fifty rooms. The building consists of continuous lines of corridors surrounding a central courtyard and connected by bridges. The principal tower is 286 ft. high to the top of the ball, and affords a view which extends over a large part of south Lancashire and Cheshire and is bounded only by the hills of Derbyshire. The tower contains a remarkable peal of bells by Taylor of Loughborough, forming an almost perfect chromatic scale of twenty-one

bells; each bell has on it a line from canto 105 of Tennyson's *In Memoriam*. The great hall is 100 ft. long and 50 ft. wide, and contains a magnificent organ built by Cavaillé-Coll of Paris. The twelve panels of this room are filled with paintings by Ford Madox Brown, illustrating the history and progress of the city. The royal exchange is a fine specimen of Italian architecture and was erected in 1869; the great meeting-hall is one of the largest rooms in England, the ceiling having a clear area, without supports, of 120 ft. in width. The exchange is seen at its best on market days (Tuesday and Friday). The assize courts were built in 1864 from designs by Waterhouse. The style is a mixture of Early English and Decorative, and a large amount of decorative art has been expended on the building. The branch Bank of England is a Doric building designed by C. R. Cockerell. There are separate town-halls for the townships of Ardwick, Chorlton, Hulme, Cheetham, Broughton and Pendleton. The Free Trade hall is a fine structure in the Lombardo-Venetian style, and its great hall will accommodate about five thousand people. It is used for public meetings, concerts, &c., and was built by Edward Walters. The Athenaeum, designed by Barry, was founded by Richard Cobden and others associated with him for "the advancement and diffusion of knowledge." The institution has, perhaps, not developed exactly on the lines contemplated by its promoters, but it has been very useful. The advantages enjoyed by members of social clubs, with the addition of facilities for educational classes and the use of an excellent news-room and a well-selected library, are offered in return for a payment which does not amount to a penny a day. The mechanics' institution has developed into the school of Technology, which now forms a part of the university. The Portico is a good specimen of the older proprietary libraries and newsrooms. It dates from 1806, and has a library. The Memorial Hall was built to commemorate the memory of the ejected ministers of 1662; it is used for meetings, scientific, educational, musical and religious. The Whitworth Institute is governed by a corporate body originating from the liberal bequests of Sir Joseph Whitworth. The Institute contains a valuable

collection of works of art and stands in the centre of a woodland park. In the park, which has been transferred to the corporation, is a sculpture group of "Christ and the Children," executed by George Tinworth from the designs of R. D. Darbishire, by whom it was presented. The assize courts, built from designs by Waterhouse (1864), the post office (1887), and the police courts (1871) should also be named. Many fine structures suffer from being hemmed in by streets which prevent the proportions from being seen to advantage.

Monuments.—In Piccadilly are bronze statues of Wellington, Watt, Dalton, Peel and Queen Victoria. Another statue of the Queen, by the Princess Louise, is placed on the new porch of the cathedral. A bronze statue of Cobden occupies a prominent position in St Ann's Square. There also is the South African War Memorial of the Manchester Regiment. The marble statue of the Prince Consort, covered by a Gothic canopy of stone, is in front of the town hall, which dwarfs what would otherwise be a striking monument. In Albert Square there are also statues of Bishop Fraser, John Bright, Oliver Heywood and W. E. Gladstone. A statue of J. P. Joule is in the town hall, which also contains memorials of other worthies. The Queen's Park has a statue of Benjamin Brierley, a well-known writer in the Lancashire dialect. The most picturesque is Matthew Noble's bronze statue of Cromwell, placed on a huge block of rough granite as pedestal. It stands at the junction of Deansgate and Victoria Street, near the cathedral, and was presented to the town by Mrs E. S. Heywood.

Education.—There are many educational facilities. The oldest institution is the grammar school, which was founded in 1519 by Hugh Oldham, bishop of Exeter, a native of the town. The master and usher appointed by the bishop were to teach freely every child and scholar coming to the school, "without any money or reward taken"; and the bishop forbade the appointment of any member of the religious orders as head master. Some corn mills were devised for the maintenance of the school, which was further

endowed at both the universities by Sarah, duchess of Somerset, in 1692. The school has now two hundred and fifty free scholars, whilst other pupils are received on payment of fees. Among those educated at the grammar school were Thomas De Quincey, Harrison Ainsworth and Samuel Bamford the Radical. After the grammar school the oldest educational foundation is that of Humphrey Chetham, whose bluecoat school, founded in 1653, is housed in the building formerly occupied by the college of clergy. This also contains the public library founded by Chetham, and is the most interesting relic of antiquity in the city. The educational charity of William Hulme (1631-1691) is administered under a scheme drawn up in 1881. Its income is nearly £10,000 a year, and it supports a grammar school and aids education in other ways. There are three high schools for girls. The Nicholls hospital was founded in 1881 for the education of orphan boys. Manchester was one of the first places to adopt the powers given by Forster's Act of 1870, and on the abolition of school boards the educational supervision was transferred to a committee of the corporation strengthened by co-opted members. In addition to the elementary schools, the municipality provides a large and well-equipped school of technology, and a school of art to which is attached an arts and crafts museum. There are a pupil teachers' college, a school of domestic economy, special schools for feeble-minded children, and a Royal College of Music. The schools for the deaf and dumb are situated at Old Trafford, in a contiguous building of the same Gothic design as the blind asylum, to which Thomas Henshaw left a bequest of £20,000. There is also an adult deaf and dumb institution, containing a news-room, lecture hall, chapel, &c., for the use of deaf mutes.

The Victoria University of Manchester has developed from the college founded by John Owens, who in 1846 bequeathed nearly £100,000 to trustees for an institution in which should be taught "such branches of learning and science as were then or might be hereafter usually taught in English universities." It was opened in 1851 in a house which had formerly

been the residence of Cobden. In 1872 a new college building was erected on the south side of the town from designs by Waterhouse. In 1880 a university charter was granted, excluding the faculties of theology and medicine, and providing for the incorporation of University College, Liverpool, and the College of Science, Leeds. The federal institution thus created lasted until 1903, when the desire of Liverpool for a separate university of its own led to a reconstruction. Manchester University consists of one college—Owens College—in its greatly enlarged form. The buildings include the Whitworth Hall (the gift of the legatees of Sir Joseph Whitworth), the Manchester Museum and the Christie Library, which is a building for the university library given by R. C. Christie, who also bequeathed his own collection. Dr Lee, the first bishop of Manchester, left his library to Owens College, and the legatees of Sir Joseph Whitworth bought and presented E. A. Freeman's books. The library has received other important special collections. The benefactions to the university of Thomas Ashton are estimated at £80,000. There are in Manchester a number of denominational colleges, Wesleyan, Primitive Methodist, Unitarian, Baptist, &c., and many of the students preparing for the ministry receive their arts training at the university, the theological degrees of which are open to students irrespective of creed.

Libraries, Museums and Societies.—Manchester is well provided with libraries. The Chetham library, already named, contains some rare manuscripts, the gem of the collection being a copy of the historical compilation of Matthew Paris, with corrections in the author's handwriting. There is a large collection of matter relating to the history and archaeology of Lancashire and Cheshire, including the transcripts of Lancashire MSS. bequeathed by Canon F. R. Raines. The collections of broadsides formed by Mr J. O. Halliwell-Phillipps, and the library of John Byrom, rich in mystics and shorthand writers, should also be named. The Manchester Free Libraries were founded by Sir John Potter

in 1852. There is now a reference library containing about 170,000 volumes, including an extensive series of English historical works, a remarkable collection of books of political economy and trade, and special collections relating to local history, Dr Thomas Fuller, shorthand and the gipsies. The Henry Watson Music Library, and the Thomas Greenwood Library for librarians were presented to the reference library, and the Foreign Library was purchased. Affiliated to the reference library there are nineteen libraries, each of which includes a lending department and reading rooms. The municipal libraries contain in the aggregate over 366,000 vols. There are also libraries in connexion with the Athenaeum, the School of Technology, the Portico, and many other institutions. The most remarkable of the Manchester libraries is that founded by Mrs Enriqueta Rylands, and named the John Rylands Library in memory of her husband. The beautiful building was designed by Basil Champneys; the library includes the famous Althorp collection, which was bought from Earl Spencer. Mrs Rylands died in 1908, and by her will increased the endowment of the library so that it has an income of £13,000 yearly. She also bequeathed her own library.

Manchester possesses numerous literary and scientific associations. The oldest of these, the Literary and Philosophical Society, founded in 1781, has a high reputation, and has numbered among its working members John Dalton, Eaton Hodgkinson, William Fairbairn, J. P. Joule, H. E. Roscoe and many other famous men of science. It has published a series of memoirs and proceedings. The Manchester Statistical Society was the first society of the kind established in the kingdom, and has issued *Transactions* containing many important papers. The Field Naturalists' and Archaeologists' Society, the Microscopical Society, the Botanists' Association, and the Geological Society may also be named. Manchester is the headquarters of the Lancashire and Cheshire Antiquarian Society and of several printing

clubs, the Chetham, the Record, the Lancashire Parish Registers societies. Seven daily papers are published, and various weekly and other periodicals. The journalism of Manchester takes high rank, the *Manchester Guardian* (Liberal) being one of the best newspapers in the country, while the *Manchester Courier* (Unionist) has an important local influence. The *Manchester Quarterly* is issued by the Manchester Literary Club, which was founded in 1862. The success of the Art Treasures Exhibition in 1857 was repeated in the Jubilee Exhibition of 1887. The Manchester Academy of Fine Arts is a society of artists, and holds an annual exhibition in the city art gallery.

Parks and Open Spaces.—There are fifty-three parks and open spaces. The Queen's Park, at Harpurhey, is pleasantly situated, though surrounded by cottages and manufactories. Philips Park is also attractive, in spite of its close proximity to some of the most densely populated portions of the town. The Alexandra Park has very good ornamental grounds and a fine cactus house with a remarkable collection presented by Charles Darrah. Some of the open spaces are small; Boggart Hole Clough, where great efforts have been made to preserve the natural features, is 76 acres in extent, and was the largest until 1902, when Heaton Park, containing 692 acres, was purchased. It was formerly the seat of the earls of Wilton, and includes Heaton House, one of Wyatt's structures. In the Queen's Park there is a museum, and periodical exhibitions of works of art are held. The total area of the city parks is 1146 acres. The corporation are also responsible for four cemeteries, having a total area of 228 acres.

Recreation.—There are nine theatres, mostly large, and eight music halls. The Theatre Royal was established as a patent theatre. When the bill for it was before the House of Lords in 1775 it was advocated as an antidote to Methodism. The Bellevue Zoological Gardens is a favourite holiday place for working people. The Ancoats Recreation Committee

have since 1882 had Sunday lectures, and occasional exhibitions of pictures, window gardening, &c. The Ancoats Art Museum was founded to carry out the educational influences of art and culture generally. In addition to works of art, there are concerts, lectures, reading circles, &c. The museum is worked in connexion with a university settlement. The German element in the population has largely influenced the taste for music by which Manchester is distinguished, and the orchestral concerts (notably under Charles Hallé) are famous.

Population.—From a census taken in 1773 it appears that there were then in the township of Manchester and its out-townships 36,267 persons. The first decennial census, 1801, showed the population to be 75,275; in 1851 it was 303,382; in 1901, 606,824. It is not easy to make an exact comparison between different periods, because there have been successive enlargements of the boundaries. The population has overflowed into the surrounding districts, and if all that belongs to the urban area, of which it is the centre, were included, greater Manchester would probably rival London in the number of its inhabitants.

Manufactures and Commerce.—Manchester is the centre of the English cotton industry (for details see COTTON and COTTON MANUFACTURE), but owing to the enhanced value of land many mills and workshops have been removed to the outskirts and to neighbouring villages and towns, so that the centre of Manchester and an ever-widening circle around are now chiefly devoted not so much to production as to the various offices of distribution. It would be a mistake, however, to regard Manchester as solely dependent upon the industries connected with cotton. There are other important manufactures which in another community would be described as gigantic. Wool and silk are manufactured on a considerable scale, though the latter industry has for some years been on the decline. The miscellaneous articles grouped under the designation of small-wares occupy many hands. Machinery and tools are made in vast quantities; the chemical industries of

the city are also on a large scale. In short, there are but few important manufactures that are wholly unrepresented. The proximity of Manchester to the rich coal-fields of Lancashire has had a marked influence upon its prosperity; but for this, indeed, the rapid expansion of its industries would have been impossible.

The Manchester Bankers' Clearing House returns show an almost unbroken yearly increase. The amount in 1872 was £72,805,510; in 1907 it was £320,296,332; by the severe depression of 1908 it was reduced to £288,555,307. Another test of prosperity is the increase in rateable value. In 1839 it was £669,994; in 1871, £1,703,627; in 1881, £2,301,225; in 1891, £2,798,005; in 1901, £3,394,879; in 1907, £4,191,039; in 1909, £4,234,129.

The commercial institutions of Manchester are too numerous for detailed description; its chamber of commerce has for more than sixty years exercised much influence on the trade of the district and of the nation. Manchester is the headquarters of the Co-operative Wholesale Society, and indeed of the cooperative movement generally.

The most important event in the modern history of the district is the creation of the Manchester Ship Canal (*q.v.*), by which Manchester and Salford have a direct communication with the sea at Eastham, near Liverpool. The canal was opened for traffic in January 1894. The official opening ceremony was on the 21st of May 1894, when Queen Victoria visited Manchester. The total expenditure on capital account has been £16,567,881. The original share capital of £8,000,000 and £1,812,000, raised by debentures, having been exhausted, the corporation of Manchester advanced on loan a further sum of £5,000,000.

Municipality.—Manchester received a municipal charter in 1838, received the title of city in 1853, and became a county borough in 1889. The city is divided into 30 wards, and the corporation consists of 31 aldermen and 93 councillors. The mayor received the title of lord mayor in 1893. Unlike some

of the municipalities, that of Manchester makes no pecuniary allowance to its lord mayor, and the office is a costly one.

The water supply is controlled by the corporation. The works at Longdendale, begun in 1848, were completed, with extensions in 1884, at a cost of £3,147,893. The area supplied by Manchester waterworks was about 85 square miles, inhabited by a million people. The increase of trade and population led to the obtaining of a further supply from Lake Thirlmere, at the foot of Helvellyn and 96 miles from Manchester. The watershed is about 11,000 acres. The daily consumption is over 38 million gallons. Manchester supplies in bulk to many local authorities in the district between Thirlmere and the city. The corporation have also established works for the supply of hydraulic and electric power.

The gas lighting of Manchester has been in the hands of the corporation for many years, as also the supply of electricity both for lighting and energy. When the works are complete the electricity committee will supply an area of 45 sq. m.

Sanitary Condition.—Dr John Tatham constructed a Manchester life-table based on the vital statistics of the decennium 1881-1890, from which it appeared that, while in England and Wales of 1000 men aged 25 nearly 800 survived to be 45 and of 1000 aged 45, 569 survived to be 65, in Manchester the survivors were only 732 and 414 respectively. The expectation of life, at 25, was, for England and Wales 36.12 years, and for Manchester 30.69 years. But the death-rate has since rapidly decreased; in 1891 it was 26.0 per thousand living; in 1901 it was 21.6; in 1906 it was 19.0; in 1907 it was 17.9. The deaths of infants under one year old amounted to 169 per 1000. The reports of the medical officer show that whilst the density of the population, the impurity of the atmosphere, and the pollution of the streams are difficult elements in the sanitary problem, great efforts have been made towards improving the

health of the people. The birth-rate in 1907 was 28.4, but the population is augmented by immigration as well as by natural increase. The number of persons to the acre is 33.

Administration of Justice.—The city has a stipendiary magistrate who, in conjunction with lay magistrates, tries cases of summary jurisdiction in the police courts. There are also quarter sessions, presided over by a recorder. Separate sessions are held for the Salford hundred. Certain sittings of the Court of Chancery for the duchy of Lancaster are held in Manchester. In addition to the county court, there is an ancient civil court known as the Salford Hundred Court of Record. Assizes have been held since 1866.

Parliamentary Representation.—By the first Reform Bill Manchester received in 1832 two representatives. In 1868 this was increased to three, but each voter had only two votes. In 1885 the city was divided into six divisions, each returning one member. Owing to the extension of the city boundaries there are Manchester voters in the Stretford, Prestwich and Gorton parliamentary divisions.

History.—Very little is known with certainty of the early history of Manchester.[1] A Roman station of some importance existed at Castlefield, and a fragment of the wall still exists. Another, perhaps earlier, was at Hunt's Bank. In the 18th century considerable evidences of Roman occupation were still visible; and from time to time, in the course of excavation (especially during the making of the Bridgewater Canal), Roman remains have been found. The coins were chiefly those of Vespasian, Antoninus Pius, Trajan, Hadrian, Nero, Domitian, Vitellius and Constantine. Investigations by the Lancashire and Cheshire Antiquarian Society and the Classical Association have brought to light many relics, chiefly of pottery. The period succeeding the Roman occupation is for some time legendary. As late as the 17th century there was a tradition that Tarquin, an enemy of King Arthur, kept the

castle of Manchester, and was killed by Lancelot of the Lake. The references to the town in authentic annals are very few. It was probably one of the scenes of the missionary preaching of Paulinus; and it is said (though by a chronicler of comparatively late date) to have been the residence of Ina, king of Wessex, and his queen Ethelberga, after he had defeated Ivor, somewhere about the year 689. Almost the only point of certainty in its history before the Conquest is that it suffered greatly from the devastations of the Danes, and that in 923 Edward, who was then at Thelwall, near Warrington, sent a number of his Mercian troops to repair and garrison it. In Domesday Book Manchester, Salford, Rochdale and Radcliffe are the only places named in south-east Lancashire, a district now covered by populous towns. Large portions of it were then forest, wood and waste lands. Twenty-one thanes held the manor or hundred of Salford among them. The church of St Mary and the church of St Michael in Manchester are both named in Domesday, and some difficulty has arisen as to their proper identification. Some antiquaries consider that the passage refers to the town only, whilst others think it relates to the parish, and that, while St Mary's is the present cathedral, St Michael's would be the present parish church of Ashton-under-Lyne. In 1301 Manchester received a charter of manorial liberties and privileges from its baron, Thomas Gresley, a descendant of one to whom the manor had been given by Roger of Poictou, who was created by William the Conqueror lord of all the land between the rivers Mersey and Ribble. The Gresleys were succeeded by the De la Warrs, the last of whom was educated for the priesthood, and became rector of the town. To avoid the evil of a non-resident clergy, he made considerable additions to the lands of the church, in order that it might be endowed as a collegiate institution. A college of clergy was thus formed, whose fellows were bound to perform the necessary services at the parish church, and to whom the old baronial hall was granted as a place of residence. The manorial rights passed to Sir Reginald West, a descendant of Joan Gresley, who was summoned to parliament as Baron de la Warre. The West family, in 1579, sold the manorial rights for £3000 to

John Lacy, who, in 1596, resold them to Sir Nicholas Mosley, whose descendants enjoyed the emoluments derived from them until 1845, when they were purchased by the municipality of Manchester for a sum of £200,000. The lord of the manor had the right to tax and toll all articles brought for sale into the market of the town. But, though the inhabitants were thus to a large extent taxed for the benefit of one individual, they had a far greater amount of local self-government than might have been supposed, and the court leet, which was then the governing body of the town, had, though in a rudimentary form, nearly all the powers now possessed by municipal corporations. This court had not only control over the watching and warding of the town, the regulation of the water supply, and the cleaning of the streets, but also had power, which at times was used freely, of interfering with the private liberty of their fellow-citizens. Thus, no single woman was allowed to be a householder; no person might employ other than the town musicians; and the amount to be spent at wedding feasts and other festivities was carefully settled. Under the protection of the barons the town appears to have steadily increased in prosperity, and it early became an important seat of the textile manufactures. Fulling mills were at work in the district in the 13th century; and documentary evidence exists to show that woollen manufactures were carried on in Ancoats at that period. In 1538 Leland described it as “the fairest, best-builded, quickest, and most populous town in Lancashire.” The right of sanctuary granted to the town in 1540 was found so detrimental to its industrial pursuits that after very brief experience the privilege was taken away. The college of Manchester was dissolved in 1547, but was refounded in Mary’s reign. Under her successor the town became the headquarters of the commission for establishing the Reformed religion. In 1641 we hear of the Manchester people purchasing linen yarn from the Irish, weaving it, and returning it for sale in a finished state. They also brought cotton wool from Smyrna to work into fustians and dimities. An act passed in the reign of Edward VI. regulates the length of cottons called Manchester, Lancashire and Cheshire cottons. These, notwithstanding their

name, were probably all woollen textures. It is thought that some of the Flemish weavers who were introduced into England by Queen Philippa of Hainault were settled at Manchester; and Fuller has given an exceedingly quaint and picturesque description of the manner in which these artisans were welcomed by the inhabitants of the country they were about to enrich with a new industry. The Flemish weavers were in all probability reinforced by religious refugees from the Low Countries.

In the civil wars, the town was besieged by the Royalists under Lord Strange (better known as earl of Derby—"the great Stanley"); but was successfully defended by the inhabitants under the command of a German soldier of fortune, Colonel Rosworm, who complained with some bitterness of their ingratitude to him. An earlier affray between the Puritans and some of Lord Strange's followers is said to have occasioned the shedding of the first blood in the struggle between the king and parliament. The year 1694 witnessed the trial of those concerned in the so-called Lancashire plot, which ended in the triumphant acquittal of the supposed Jacobites. That the district really contained many ardent sympathizers with the Stuarts was, however, shown in the rising of 1715, when the clergy ranged themselves to a large extent on the side of the Pretender; and was still more clearly shown in the rebellion of 1745, when the town was occupied by Prince Charles Edward Stuart, and a regiment, known afterwards as the Manchester regiment, was formed and placed under the command of Colonel Francis Townley. In the fatal retreat of the Stuart troops the Manchester contingent was left to garrison Carlisle, and surrendered to the duke of Cumberland. The officers were taken to London, where they were tried for high treason and beheaded on Kennington Common.

The variations of political action in Manchester had been exceedingly marked. In the 16th century, although it produced both Roman Catholic and Protestant martyrs, it was earnestly in favour of the Reformed faith, and in the succeeding century it became indeed a stronghold of Puritanism. Yet the

successors of the Roundheads who defeated the army of Charles I. were Jacobite in their sympathies, and by the latter half of the 18th century had become imbued with the aggressive form of patriotic sentiment known as anti-Jacobinism, which showed itself chiefly in dislike of reform and reformers of every description. A change, however, was imminent. The distress caused by war and taxation, towards the end of the 18th and the beginning of the 19th century, led to bitter discontent, and the anomalies existing in the parliamentary system of representation afforded only too fair an object of attack. While single individuals in some portions of the country had the power to return members of parliament for their pocket boroughs, great towns like Manchester were entirely without representation. The popular discontent was met by a policy of repression, culminating in the affair of Peterloo, which may be regarded as the starting-point of the modern reform agitation. This was in 1819, when an immense crowd assembled on St Peter's Fields (now covered by the Free Trade Hall and warehouses) to petition parliament for a redress of their grievances. The Riot Act was read by a clerical magistrate; but in such a manner as to be quite unheard by the mass of the people; and drunken yeomanry cavalry were then turned loose upon the unresisting mass of spectators. The yeomanry appear to have used their sabres freely; several people killed and many more injured; and, although the magistrates received the thanks of the prince regent and the ministry, their conduct excited the deepest indignation throughout the entire country. Those who had organized the meeting, including "Orator" Hunt with Samuel Bamford and other working men, were imprisoned.

Naturally enough, the Manchester politicians took an important part in the Reform agitation; when the Act of 1832 was passed, the town sent as its representatives the Right Hon. C. P. Thomson, vice-president of the board of trade, and Mark Philips. With one notable exception, this was the first time that Manchester had been represented in parliament since its barons had seats in the House of Peers in the earlier centuries. In 1654 Charles Worsley

AUTHORITIES.—Although several excellent books have been written on subjects connected with the town, there is no adequate modern history. The *History of Manchester*, by the Rev. John Whitaker, appeared in 1771; it is a mere fragment, and, though containing much important matter, requires to be very discreetly used. The following may be recommended: John Reilly, *History of Manchester*, (1861); R. W. Procter, *Manchester in Holiday Dress* (1866), *Memorials of Manchester Streets* (1874), *Memorials of Byegone Manchester* (1880); Richard Buxton, *Botanical Guide to Manchester, &c.* (2nd ed., 1859); Leo Grindon, *Manchester Flora* (1859); Edward Baines, *History of Lancashire*, edited by Croston (1886-1893), 5 vols.; W. A. Shaw, *Manchester, Old and New* (1894); W. E. A. Axon, *Annals of Manchester* (1885), *Cobden as a Citizen* (1906); Harry Rawson, *Historical Record of some Recent Enterprises of the Corporation of Manchester* (1894); *Official Manual of Manchester and Salford* (1909); J. P. Earwaker, *Court Leet Records of Manchester, 1552-1686, 1731-1846* (1884-1890), 12 vols.; *Constable's Accounts, 1612-1647, 1743-1776* (1891-1892), 3 vols.; *Manchester Municipal Code* (1894-1899), 5 vols.; George Saintsbury, *Manchester* (1887); Thomas Swindells, *Manchester Streets and Manchester Men* (1906-1907), 3 vols.; James Tait, *Medieval Manchester* (1904); Charles Roeder, *Roman Manchester* (1900); Sir Bosdin Leech, *History of the Manchester Ship Canal* (1907), 2 vols.

(W. E. A. A.)

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1 In the *Antonine Itinerary* the name Mancunium (*q.v.*) or Mamucium is given. This is the origin of the modern name, and has supplied the adjective "Mancunian" (cf. "Old Mancunians" applied to old boys of Manchester Grammar School).

MANCHESTER (popularly Manchester-by-the-Sea), a township of Essex county, Massachusetts, U.S.A., about 25 m. N.E. of Boston, on Massachusetts Bay. Pop. (1900), 2522; (1905, state census), 2618; (1910), 2673. Area, 7.64 sq. m. It is served by the Boston & Maine railroad, and is connected with neighbouring towns and cities by electric lines. The township, heavily wooded in parts, and with picturesque shores alternating between rocky headlands and sandy beaches, stretches for several miles along the coast between Beverly on the west and Gloucester on the east. It is one of the most beautiful watering-places in America, and is the favourite summer residence of many of the foreign diplomats at Washington. The "singing beach" is a stretch of white sand, which, when trodden upon, emits a curious musical sound. Manchester, originally a part of Salem, was settled about 1630 and was at first known as Jeffrey's Creek. It was incorporated separately under its present name in 1645.

See *Manchester Town Records* (2 vols., Salem, 1889-1891), and D. F. Lamson, *History of the Town of Manchester, 1645-1895* (Manchester, 1895).

MANCHESTER, the largest city of New Hampshire, U.S.A., and one of the county-seats of Hillsboro county, on the Merrimac river, at the mouth of the Piscataquog river, (by rail) 18 m. S. of Concord and 57 m. N.N.W. of Boston. Pop. (1890), 44,126; (1900), 56,987; (1910 U.S. census) 70,063. Of the total population in 1900, 24,257 were foreign-born, including 13,429 French-Canadians; and 37,530 were of foreign parentage (both parents foreign-born), including 18,839 of French-Canadian parentage. Manchester is served by the Southern, the Western, the White Mountains, and the Worcester Nashua & Portland divisions of the Boston & Maine railroad, and by inter-urban electric lines. It is situated on a plain about 90 ft. above the Merrimac river (which is spanned here by three bridges), commands extensive views of the beautiful Merrimac valley, and covers a land area of about 33 sq. m. On the east side of the city are two connected lakes known as Lake Massabesic (30 m. in circumference). Manchester is known for the attractive appearance of the residence districts in which the factory operatives live, detached homes and "corporation boarding-houses," instead of tenement houses, being the rule. The Institute of Arts and Sciences (incorporated in 1898) provides lecture courses and classes in science, art and music. Among the other public buildings and institutions are the United States Government building, the city-hall, the county-court-house, the city library (1854; the outgrowth of the Manchester Athenaeum, established in 1844), St Anselm's College (R.C.), a Roman Catholic cathedral, four Roman Catholic convents, the Elliot hospital, the Sacred Heart hospital and the hospital of Notre Dame de Lourdes, the State industrial school, the State house of correction, the Gale home for aged women, an old ladies' home (R.C.), St Martha's home for working girls, the Manchester children's home and four orphan asylums. In the largest of five public squares is a soldiers' monument, consisting of a granite column 50 ft. high, surmounted by a statue of Victory. The city has two parks, and in one of them, overlooking the Merrimac, is a monument to the memory of General John Stark, who was born and was buried here. The water-supply is obtained from Lake Massabesic. Amoskeag Falls in the Merrimac are 55 ft. in height,

and by means of hydraulic canals Manchester is provided with a fine water-power. Steam power is also used, and the city is by far the most important manufacturing centre in the state. It is extensively engaged in the manufacture of cotton goods, boots and shoes, worsted goods, hosiery and other knit goods, and locomotives; among the other manufactures are linen goods, steam fire-engines, paper, edge tools, soap, leather, carriages and beer. The value of the city's factory products increased from $24,628,345 in 1900 to $30,696,926 in 1905, or 24.6%. In 1905 Manchester produced 24.8% of the total factory product of the state. Manchester ranks fifth among the cities of the United States in cotton manufacturing, and ninth among the cities of the country in the manufacture of boots and shoes.

On account of the abundance of fish in the river here, Amoskeag Falls and vicinity were a favourite resort of the Penacook Indians, and it is said that John Eliot, the "Apostle to the Indians," preached to them here in the summer of 1651. The first white settlement within the present limits of Manchester was made in 1722 by Scottish-Irish immigrants at Goffe's Falls, 5 m. below Amoskeag Falls. In 1723 a cabin was built by some of these immigrants at the greater falls, and gradually a small settlement grew up there. In 1735 Massachusetts granted to a body of men known as "Tyng's Snow-Shoe Scouts" and their descendants a tract of land 3 m. wide along the east bank of the Merrimac, designated as "Tyng's Township." The Scottish-Irish claimed this tract as part of their grant from New Hampshire, and there arose between the rival claimants a bitter controversy which lasted until May 1741, when the courts decided against the Massachusetts claimants. In 1751 the territory formerly known as "Tyng's Township," and sometimes called "Harrytown," with portions of Chester and Londonderry, was incorporated as a township under the name Derryfield; in 1810 the name was changed to Manchester, the change having been suggested by the town's manufacturing possibilities; and in 1846 Manchester was chartered as a city. The first sawmill was erected as early as 1736, and during the years from 1794 to 1807 a canal was constructed around the Amoskeag Falls through which to carry lumber. As late as 1830 the

town had a population of only 877, but in 1831 the Amoskeag Manufacturing Company was incorporated, the construction of hydraulic canals and the erection of cotton mills followed, the villages of Piscataquog and Amoskeag were annexed in 1853, and the population increased to 3235 in 1840, to 8841 in 1860, and to 33,592 in 1880.

Consult M. D. Clarke, *Manchester, A Brief Record of its Past and a Picture of its Present* (Manchester, 1875).

MANCHESTER, a former city of Chesterfield county, Virginia, U.S.A., (on the S. side of the James river), since 1910 a part of Richmond. Pop. (1900), 9715, of whom 3338 were negroes; (1906 estimate), 9997. It is served by the Atlantic Coast Line, the Seaboard Air Line, and the Southern railways, by electric lines to Richmond and Petersburg, and by numerous river boats. It is finely situated in a bend of the river, with about 2 m. of water front; on the heights above is Forest Hill park, a pleasure resort, and adjacent to it Woodland Heights, a beautiful residential district. From the surrounding country come much agricultural produce, coal, lumber, bricks and granite. There is a good harbour and excellent water power. Among the manufactures are paper, flour, cotton goods, leather, brick, railway supplies, &c. The value of the city's factory products increased from $1,621,358 in 1900 to $3,226,268 in 1905, or 99%.

MANCHESTER SHIP CANAL. The advantage of a waterway for the conveyance of goods between eastern Lancashire and the sea is so obvious that so far back as the year 1721 Thomas Steers designed a plan for continuing to Manchester the barge navigation which then existed between Liverpool and Warrington. Parliamentary powers were then obtained to improve the rivers Mersey and Irwell from Warrington to Manchester by means of locks and weirs. This work was successfully carried out, and proved of great benefit to the trade of the district. The duke of Bridgewater, who had made a canal from his collieries at Worsley to Manchester, afterwards continued the canal to the Mersey at Runcorn; this extension was opened in 1722 and competed with the Mersey and Irwell navigation, both routes being navigated by barges carrying about fifty tons of cargo. The Liverpool & Manchester railway at a later date afforded further facilities for conveyance of goods, but the high rates of carriage, added to heavy charges at the Liverpool docks, prejudiced trade, and the question was mooted of a ship canal to bring cotton, timber, grain and other goods direct to Manchester without transshipment. The first plan was made by William Chapman in 1825, and was followed by one designed by Henry Palmer in 1840, but it was not until the year 1882 that the movement was originated that culminated in the opening of the Manchester Ship Canal by Queen Victoria on the 21st of May 1894.

In determining the plan of the canal the main point which arose was whether it should be made with locks or whether it should be on the sea-level throughout, and therefore tidal. The advantage of a still waterway in navigating large steamers, and the facilities afforded by one constant

water-level for works on the banks and the quick discharge of goods at the terminal docks at Manchester, secured the adoption of the plans for a canal with locks as designed by Sir E. Leader Williams. The fresh-water portion of the canal extended between Manchester and Runcorn, while from the latter place to Garston it was proposed to improve the upper Mersey estuary by constructing training walls and dredging to form a deep central channel. Parliamentary powers to construct the canal were sought in the session of 1883, when the bill passed the committee of the House of Commons but was rejected by the committee of the House of Lords. Brought forward again the next year, it was passed by the Lords but thrown out by the Commons. The opposition from Liverpool and the railway companies was very strong; to meet to some extent that of the former, a continuation of the canal was proposed from Runcorn to Eastham along the Cheshire side of the Mersey, instead of a trained channel in the estuary, and in this form the bill was again introduced in the session of 1885, and, notwithstanding strong opposition, was passed by both houses of parliament. The cost of this contest to promoters and opponents exceeded £400,000, the various committees on the bill having sat over 175 days. Owing to difficulties in raising the capital the works were not begun until November 1887.

The total length of the canal is 35½ m. and it may be regarded as divided into three sections. From Eastham to Runcorn it is near or through the Mersey estuary for 12¾ m., and thence to Latchford near Warrington, 8¼ m., it is inland; both these sections have the same water-level, which is raised by high tides. At Latchford the locks stop tidal action, and the canal is fed by the waters of the rivers Mersey and Irwell from that point to Manchester, 14½ m. from Latchford. The canal begins on the Cheshire side of the Mersey at Eastham, about 6 m. above Liverpool. The entrance is well sheltered and adjoins a good low-water channel communicating with the Sloyne deep at Liverpool. Three entrance locks have been provided close to and parallel with each other, their length and width

being 600 by 80, 350 by 50, and 150 by 30 ft. These locks maintain the water-level in the canal nearly to mean high-water level (14 ft. 2 in. above the Liverpool datum); when the tide rises above that height the lock gates are opened and the tide flows up to Latchford, giving on high spring tides an additional depth of water of about 7 ft. On the ebb tide this water is returned to the Mersey through large sluices at Randles Creek and at the junction of the river Weaver with the canal, the level of the canal thus being reduced to its normal height. The canal throughout to Manchester has a minimum depth of 28 ft.; the depth originally was 26 ft., but the lock sills were placed 2 ft. lower to allow of the channel being dredged to 28 ft. when necessary. The minimum width at bottom is 120 ft., allowing large vessels to pass each other at any point on the canal; this width is considerably increased at the locks and other parts. The slopes are generally about 1½ to 1, but are flatter through some portions; in rock-cutting the sides are nearly vertical. From Eastham to Runcorn the canal is alternately inland and on the foreshore of the estuary, on which embankments were constructed to act as dams and keep out the tide during the excavation of the canal, and afterwards to maintain the water-level at low water in the estuary; both sides are faced with heavy coursed stone. The material for the embankments was principally clay excavated from the cuttings. In some places, where the foundation was of a porous nature, sheeting piles of timber had to be used. At Ellesmere Port, where the embankment is 6200 ft. long on sand, 13,000 whole timber sheeting piles 35 ft. long were driven, to secure the base of the embankment on each side; water jets under pressure through 1½ in. wrought-iron pipes were used at the foot of each pile to assist the sinking, which was found most difficult by ordinary means. At the river Weaver ten Stoney roller sluices are built, each 30 ft. span, with heavy stone and concrete piers and foundations; at Runcorn, where the river Mersey is narrow, a concrete sea-wall 4300 ft. long was substituted for the embankment. At various points under the canal cast-iron siphon pipes were laid to carry off any land drainage which was at a lower level than the canal; the largest of these

siphons were constructed to allow the tidal and fresh water of the river Gowy to pass under the canal at Stanlow Point, between Eastham and Ellesmere Port. Two 12-ft. siphons are there placed close together, built of cast-iron segments; they are each 400 ft. long, and were laid on concrete 4 ft. below the bottom of the canal. From Runcorn to Latchford the canal is nearly straight, the depth of cutting varying from 35 to 70 ft., partly in rock, but generally in alluvial deposit. The whole length of the canal passes through the New Red Sandstone formation, with its overlying beds of gravel, clay, sand and silt, which gave much trouble during the progress of the work; retaining walls of stone and brickwork had to be built in these places to maintain the sides of the canal from slips and injury from the wash of steamers.

The canal from Latchford to Manchester is in heavy cutting through the valleys of the rivers Mersey and Irwell. As these rivers are circuitous in course, only very small portions could be utilized in forming the canal; a line as nearly straight as possible was therefore adopted, and involved many crossings of the river channels. During the whole progress of the work these had to be kept open for the discharge of floods and land water, and in some places temporary cuts of considerable length had to be made for the same object. In November 1890 and December 1891 high winter floods covered the whole of the river valleys, filling many miles of the unfinished canal and causing great damage to the slopes. Altogether 23 m. of canal had to be pumped out to enable the work to be completed. After the cuttings between the river channels were finished, the end dams were removed, and the rivers Irwell and Mersey were turned into the new channel now forming the upper portion of the ship canal. The total rise to the level of the docks at Manchester from the ordinary level of the water in the tidal portion of the canal below Latchford locks is 60 ft. 6 in.; this is obtained by an average rise of about 15 ft. at each of the sets of locks at Latchford, Irlam (7½ m. nearer Manchester), Barton (2 m. farther) and Mode Wheel (3½ m. above Barton locks at the entrance to the Manchester

docks). For the greater part of this last length the canal is widened at bottom from 120 ft., its normal width, to 170 ft., to enable vessels to lie at timber and other wharves without interfering with the passage of large vessels to or from the docks. The locks are in duplicate, one being 600 ft. long by 65 ft. wide, the other 350 ft. long by 45 ft. wide, with Stoney's sluices adjacent. They are filled or emptied in five minutes by large culverts on each side with side openings into the lock. Concrete with facings of blue Staffordshire brick is largely used, and the copings, sills, hollow quoins and fender courses are of Cornish granite. The lock gates are constructed of greenheart timber. The sluices near the locks take the place of the weirs used in the old Mersey and Irwell navigation; they are 30 ft. span each, four being generally used at each set of locks. In ordinary seasons any water not used for lockage purposes passes over the tops of the sluices, which are kept closed; in flood times the sluices are raised to a height which will pass off floods with a comparatively small rise in the canal. There are eight hydraulic installations on the canal, each having duplicate steam-engines and boilers; the mains exceed 7 m. in length, the pressure being 700 ℔ to the inch. They work the cranes, lifts and capstans at the docks, lock gates and culvert sluices, coal tips, swing bridges and aqueduct.

At Barton, near Manchester, the Bridgewater canal crosses the river Irwell on the first navigable aqueduct constructed in England. It was the work of James Brindley, and since it was built at only sufficient height to allow of barges passing under it, means had to be found to allow of this important canal being maintained, and yet to permit steamers to use the ship canal below it. Brindley's canal is on one level throughout its whole length, and as its water supply is only sufficient for the flight of locks by which it descends at Runcorn to the Mersey, locks down to the ship canal would have involved the waste of a lock of water on each side and caused serious delay to the traffic. Sir E. Leader Williams surmounted the difficulty by means of a swing aqueduct for the Bridgewater canal, which

when closed enables the traffic to pass as before, while it is opened to allow of ships crossing it on the lower level of the ship canal. The water in the swing portions of the aqueduct when opened is retained by closing gates at each end, similar gates being shut at the same time across the fixed portion of the aqueduct. The swing portion is a large steel trough carried by side girders, 234 ft. long and 33 ft. high in the centre, tapering 4 ft. to the ends; the waterway is 19 ft. wide and 6 ft. deep. The whole works on a central pier with similar arrangements to the largest swing bridges on the canal; it has two spans over the ship canal of 90 ft. each. It is somewhat singular that the first fixed canal aqueduct in England should, after the lapse of 136 years, be replaced by the first swing aqueduct ever constructed. The swing aqueduct is moved by hydraulic power, and has never given any trouble in working, even in times of severe frost. The weight of the movable portion, including the water, is 1600 tons.

The manner of dealing with the five lines of railways that were cut through by the canal was one of importance, both in the interests of the travelling public and the trade on the canal; they are all lines with a heavy traffic, including the main line of the London & North Western railway near Warrington, with its important route to Scotland. Swing bridges, although in use on some lines to cross navigations, are dangerous and inconvenient, and high-level deviation lines were adopted for each railway crossing the canal. No such alteration of a railway had been previously sanctioned by parliament, and it was only the importance of a ship canal to Manchester that secured the requisite powers against the strong opposition of the railway companies. Embankments were made close to and parallel with the old lines, beginning about a mile and a quarter from the canal on each side, the canal itself being crossed by viaducts which give a clear headway of 75 ft. at ordinary water-level. Vessels with high masts trading on the canal are provided with telescopic or sliding top-masts. The gradients on the railways rising up to the viaducts are 1 in 135. The span of the viaducts is so arranged as to maintain the full width of the

canal for navigation; and as the railways generally cross the canal on the skew, this necessitated girders in some cases of 300 ft. span. There are nine main roads requiring swing bridges across the canal; all below Barton have a span giving a clear waterway of 120 ft. The width of these bridges varies with the importance of the roads from 20 to 36 ft., and they are constructed of steel, their weight ranging from 500 to 1000 tons each. They work on a live ring of conical cast-iron rollers and are moved by hydraulic power supplied by steam, gas or oil engines. The Trafford Road bridge at the docks at Manchester is the heaviest swing bridge on the canal; being of extra width, it weighs 1800 tons.

The canal being virtually one long dock, wharves at various points have been erected to enable chemical or manufacturing works to be carried on, widenings being provided where necessary. At Ellesmere Port coal tips and sheds have been erected, and the canal is in direct communication with the docks there as well as at Weston Point and Runcorn, where a large trade is carried on with the Staffordshire Potteries and the Cheshire salt districts. At Partington branches from the railways connect the canal with the Yorkshire and Lancashire coal-fields, and the canal is widened out 65 ft. on each side for six hydraulic coal tips. At Mode Wheel there are extensive abattoirs and lairages, erected by the Manchester Corporation; also large petroleum oil tanks, graving dock and pontoons, cold-air meat stores and other accommodation for traffic. At Manchester the area of the docks is 104 acres, with 152 acres of quay space, having over 5 m. of frontage to the docks, which are provided with a number of three-storey transit sheds, thirteen seven-storey and seven four-storey warehouses, and a large grain silo. The London & North Western and Lancashire & Yorkshire railway companies and the Cheshire Lines Committee have made branch lines to the docks, the railways and sidings at which are over 30 miles in length. Much traffic is also carted, or dealt with by inland canals in direct communication with the docks. The substitution of a wide and deep canal, nearly straight, for comparatively

shallow and narrow winding rivers, and the use of large sluices in place of fixed weirs to carry off the river water, have been of great advantage to the district in greatly reducing the height of floods.

The total amount of excavation in the canal, docks and subsidiary work amounted to over 54 million cub. yds., nearly one-fourth of which was sandstone rock; the excavated material was used in forming the railway deviation embankments, filling up the old beds of the rivers and raising low lands near the canal. As many men were employed on the works as could be obtained, but the number never exceeded 17,000, and the greater part of the excavation was done by about eighty steam navvies and land dredgers. For the conveyance of excavation and materials, 228 miles of temporary railway lines were laid, and 173 locomotives, 6300 wagons and trucks, and 316 fixed and portable steam-engines and cranes were employed, the total cost of the plant being nearly £1,000,000. The expenditure on the works, including plant and equipment, to the 1st of January 1900, was £10,327,666. The purchase of the Mersey and Irwell and Bridgewater navigations (£1,786,651), land and compensation (£1,223,809), interest on capital during constructions (£1,170,733), and parliamentary, superintendence and general expenses brought up the total amount to £15,248,437.

The traffic on the canal gradually increased from 925,659 tons in 1894 to 2,778,108 tons in 1899 and 5,210,759 tons in 1907. After its opening considerable reductions were made in the railway rates of carriage and the charges at the Liverpool docks in order to meet the lower cost of conveyance by shipping passing up it. The result has been of great advantage to the trade of Lancashire and the surrounding districts, and the saving in the cost of carriage, estimated at £700,000 a year, assists manufacturers to meet the competition of their foreign opponents who have the advantage of low rates of carriage on the improved waterways of America, Germany, France and Belgium. Before the construction of the canal, large manufacturers had left Manchester to establish their works at

ports like Glasgow, where they could save the cost of inland carriage. Since its opening, new industries have been started at Manchester and along its banks, warehouses and mills that were formerly empty are now occupied, while nearly 10,000 new houses have been built for the accommodation of the workpeople required to meet the enlarged trade of the city.

For further details see Sir Bosdin Leech, *History of the Manchester Ship Canal* (Manchester, 1907). (E. L. W.)

MANCHURIA, the name by which the territory in the east of Asia occupied by the Manchus is known in Europe. By the Chinese it is called the country of the Manchus, an epithet meaning "pure," chosen by the founder of the dynasty which now rules over Manchuria and China as an appropriate designation for his family. Manchuria lies in a north-westerly and south-easterly direction between 39° and 53° N. and between 116° and 134° E., and is wedged in between China and Mongolia on the west and north-west, and Korea and the Russian territory on the Amur on the east and north. More definitely, it is bounded N. by the Amur, E. by the Usuri, S. by the Gulf of Liao-tung, the Yellow Sea and Korea, and W. by Chih-li and Mongolia. The territory thus defined is about 800 m. in length and 500 m. in width, and contains about 390,000 sq. m. It is divided into three provinces, viz. Hei-lung-kiang or Northern Manchuria, Kirin or Central Manchuria, and Shēng-king or Southern Manchuria. Physically the country is divided into two regions, the one a series of mountain ranges occupying the northern and eastern portions of

the kingdom, and the other a plain which stretches southwards from Mukden, the capital, to the Gulf of Liao-tung.

A system of parallel ranges of mountains, culminating in the Chinese Ch'ang pai Shan, "the long white mountains," on the Korean frontier, runs in a north-easterly direction from the shores of the Gulf of Liao-tung. In its course through Eastern Manchuria it forms the watershed of the Sungari, Usuri and other rivers, and in the south that of the Ya-lu and many smaller streams. It also forms the eastern boundary of the great plain of Liao-tung. The mountains of this system reach their greatest height on the south-east of Kirin, where their snow-capped peaks rise to the elevation of 8000 ft. The scenery among them is justly celebrated, more especially in the neighbourhood of Haich'ēng, Siu-yen and the Korean Gate.

The three principal rivers of Manchuria are the Sungari, Mutan-kiang and Usuri already mentioned. Of these the Sungari, which is the largest, rises on the northern slopes of the Ch'ang pai Shan range, and runs in a north-westerly direction to its junction with the Nonni, from which point it turns north-east until it empties itself into the Amur. It is navigable by native junks above Kirin, which city may also be reached by steamer. In its long course it varies greatly both in depth and width, in some parts being only a few feet deep and spreading out to a width of more than a mile, while in other and mountainous portions of its course its channel is narrowed to 300 or 400 ft., and its depth is increased in inverse ratio. The Usuri rises in about 44° N. and 131° E., and after running a north-easterly course for nearly 500 m. it also joins the Amur. The Mutan-kiang takes its rise, like the Sungari, on the northern slopes of the Ch'ang pai Shan range, and not far from the sources of that river. It takes a north-easterly course as far as the city of Ninguta, at which point it turns northward, and so continues until it joins the Sungari at San-sing. It is navigable by junks between that city and Ninguta, though the torrents in its course make the voyage backwards and forwards one of considerable difficulty. Next in importance to these rivers are the Liao and Ya-lu, the former of which rises in Mongolia, and after running in an easterly direction for about

400 m. enters Manchuria in about 43° N., and turning southward empties itself into the Gulf of Liao-tung. The Ya-lu rises in Korea, and is the frontier river of that country.

Provinces and Towns.—Mukden, or as it is called by the Chinese Shēng-king, the capital city of Manchuria, is situated in the province of Shēng-king, occupies a fine position on the river Hun-ho, an affluent of the Liao, and is a city of considerable pretensions. Liao-yang, which was once the capital of the country, is also in the province of Shēng-king. The other cities in the province are Kin-chow-fu on the west of the Gulf of Liao-tung; Kin-chow, on the western extremity of the Liao-tung peninsula; Kai-ping, on the north-western shore of the same peninsula; Hai-chēng, on the road from Niu-chwang to Mukden; Ki-yuen, a populous and prosperous city in the north of the province; and Sing-king, east of Mukden, the original seat of the founders of the present dynasty. The most important commercial place, however, is the treaty port of Niu-chwang, at the head of the Gulf of Liao-tung. According to the custom-house returns the value of the foreign imports and exports in the year 1880 was £691,954 and £1,117,790 respectively, besides a large native trade carried on in junks. In 1904 the value of foreign imports had risen to £2,757,962, but the exports amounted to £1,742,859 only, the comparatively low figure being accounted for by the Russo-Japanese war.

The province of Kirin, or Central Manchuria, is bounded on the N. and N.W. by the Sungari, on the S. by Shēng-king and Korea, on the W. by Mongolia, and on the E. by the Usuri and the maritime Russian province. It contains an area of about 90,000 sq. m., and is entirely mountainous with the exception of a stretch of plain country in its north-western corner. This plain produces large quantities of indigo and opium, and is physically remarkable for the number of isolated conical hills which dot its surface. These sometimes occur in a direct line at intervals of 15 or 20 m., and elsewhere are scattered about “like dish-covers on a table.” Kirin, the capital of the province, occupies a magnificent position, being surrounded on the north, west and south by a semicircular range of mountains with the broad stream of the Sungari flowing across the

front. The local trade is considerable. A-She-ho, on the Ashe, with a population of 60,000; Petuna (Chinese, Sing-chung), on the Sungari, population 30,000; San-sing, near the junction of the Sungari and Mutan-kiang; La-lin, 120 m. to the north of Kirin, population 20,000; Harbin or Kharbin and Ninguta are the other principal cities in the province.

Hei-lung-kiang, or Northern Manchuria, which contains about 195,000 sq. m., is bounded on the N. and N.E. by the Amur, on the S. by the Sungari, and on the W. by the Nonni and Mongolia. It is traversed by the Great and Lesser Khingan mountains and their offshoots. This province is thinly populated, and is cultivated only along the lines of its rivers. The only towns of any importance are Tsitsihar and Mergen, both situated on the Nonni and Khailar in the west.

Climate, Flora, Fauna.—The climate over the greater part of the country varies between extremes of heat and cold, the thermometer ranging between 90° F. in the summer and 10° below zero in the winter. As in the north of China, the rivers are frozen up during the four winter months. After a short spring the heat of summer succeeds, which in its turn is followed by an autumn of six weeks' duration. The great plain in Shēng-king is in many parts swampy, and in the neighbourhood of the sea, where the soil emits a saline exudation such as is also common in the north of China, it is perfectly sterile. In other parts fine crops of millet and various kinds of grain are grown, and on it trees flourish abundantly. The trees and plants are much the same as those common in England, and severe as the weather is in winter the less elevated mountains are covered to their summits with trees. The wild animals also are those known in Europe, with the addition of tigers and panthers. Bears, wild boars, hares, wolves, foxes and wild cats are very common, and in the north sables are found in great numbers. One of the most noticeable of the birds is the Mongolian lark (*Melanocorypha mongolica*), which is found in a wild state both in Manchuria and in the desert of Mongolia. This bird is exported in large numbers to northern China, where it is much prized on

account of its extraordinary power of imitation. The Manchurian crane is common, as also are eagles, cuckoos, laughing doves, &c. Insects abound, owing to the swampy nature of much of the country. The rivers are well stocked with fish, especially with salmon, which forms a common article of food. In such immense shoals do these fish appear in some of the smaller streams that numbers are squeezed out on to the banks and there perish.

Products and Industries.—In minerals Manchuria is very rich: coal, gold, iron (as well as magnetic iron ore), and precious stones are found in large quantities. Gold mines are worked at several places in the northern part of Manchuria, of which the principal are on the Muho river, an affluent of the Amur, and near the Russian frontier. Mines are also worked at Kwanyin-shan, opposite the Russian frontier town of Radevska, and at Chia-pi-kou, on an affluent of the upper Sungari. Indigo and opium are the most lucrative crops. The indigo plant is grown in large quantities in the plain country to the north of Mukden, and is transported thence to the coast in carts, each of which carries rather more than a ton weight of the dye. The poppy is cultivated wherever it will grow, the crop being far more profitable than that of any other product. Cotton, tobacco, pulse, millet, wheat and barley are also grown.

Population.—The population is estimated as follows for each of the three divisions:—

Province of Shēng-king (Fēng T'ien)	4,000,000
Province of Kirin	6,500,000
Province of Hei-lung-kiang	2,000,000
Total	12,500,000

Communications.—Four principal highways traverse Manchuria. The first runs from Peking to Kirin via Mukden, where it sends off a branch to Korea. At Kirin it bifurcates, one branch going to San-sing, the extreme north-eastern town of the province of Kirin, and the other to Possiet Bay on the coast via Ninguta. The second road runs from the treaty port of Niu-chwang through Mukden to Petuna in the north-western corner of the Kirin province, and thence to Tsitsihar, Mergen and the Amur. The third also starts from Niu-chwang, and strikes southward to Kin-chow at the extremity of the Liao-tung peninsula. The fourth connects Niu-chwang with the Gate of Korea.

MANCHURIA
Scale, 1:11,500,000
English Miles
0 50 100 200
Railways
Capital
Provincial Capitals
116° A 120° B 124° C 128° D 132° E
Longitude East 124° of Greenwich
Amur
Stretensk
Nerchinsk
Manchuria
Khailar
Kulun-nor
Buir-nor
Tsi-tsi-har
Aigun
Blagovyeshchensk
Khabarovsk
Mergen
Hulan
Harbin
Petuna (Sing-chung)
Kirin
Ninguta
Nikolsk
Vladivostok
Mukden
Sheng-king
Kin-chow
Yung-ping Fu
Taku
Gulf of Chih-li
Port Arthur (to Japan)
Str. of Chih-li
Port Adams
Korea Bay
Phyöng-yang
Wiju
Ham-heung
Broughton Bay or Gulf of Koreg
Port Lazarev
C. Durach
Kyöng-söng
C. Kosakou
Kil-ju
Song-chin
Port Shestakov
Gulf of Liao-tung
Liao-yang
Chang-chun
Kwang-cheng-tsze
Tarkha-chang
Tsitsihar
Khingan Mts.
Little Khingan Mts.
Hei-lung-kiang
Mongolia
Eastern Gobi
Manchuria
Chihli
Korea
Sea of Japan
Amur
Ussuri
Sungari
Nonni
Hulan
Tambol
Tola
Gobi
Khingan
Emery Walk

Manchurian Railways.

The original Manchurian railway was constructed under an agreement made in 1896 between the Chinese government and the Russo-Chinese bank, an institution founded in 1895 to develop Russian interests in the East. The Chinese Eastern Railway Company was formed by the bank under this agreement, to construct and work the line, and surveys were made in 1897, the town of Harbin being founded as headquarters for the work. The line, which affords through communication from Europe by way of the Trans-Siberian system, enters Manchuria near a station of that name in the north-west corner of the country, passes Khailar, and runs south-east, near Tsitsihar, to Harbin. Thence the main line continues in the same general direction to the eastern frontier of Manchuria, and so to Vladivostok. In 1898 Russia obtained a lease of the Liao-tung peninsula, and a clause of this contract empowered her to connect Port Arthur and Dalny (now Tairen) with the main Manchurian railway by a branch southward from Harbin. In spite of interruption caused by the Boxer outbreak, through communication was established in 1901. Under the Russo-Japanese treaty of August 1905, after the war, supplemented by a convention between Japan and China concluded in December of the same year, Japan took over the line from Port Arthur as far as Kwang-chēng-tsze, now known as the Southern Manchurian railway (508 m.). Branches were promoted (*a*) from Mukden to Antung on the Ya-lu, to connect with the Korean system, and (*b*) from Kwang-chēng-tsze to Kirin. The rest of the original Manchurian system (1088 miles) remains under Russian control. In the south-west of Manchuria a line of the imperial railways of Northern China gives connexion from Peking, and Branches at Kou-pang-tsze to Sin-min-ting and to Niu-chwang, and the link between Sin-min-ting and Mukden is also under Chinese control. The lines now under Russian control were laid down, and remain, on the 5 ft. gauge which is

the Russian standard; but after the Russian control of the southern lines was lost the gauge was altered from that standard.

History.—Manchu, as has been said, is not the name of the country but of the people who inhabit it. The name was adopted by a ruler who rose to power in the beginning of the 13th century. Before that time the Manchus were more or less a shifting population, and, being broken up into a number of tribes, they went mainly under the distinctive name of those clans which exercised lordship over them. Thus under the Cbow dynasty (1122-225 B.C.) they were known as Sewshin, and at subsequent periods as Yih-low, Wuh-keih, Moh-hoh, Pohai, Nüchih and according to the Chinese historians also as Khitan. Throughout their history they appear as a rude people, the tribute they brought to the Chinese court consisting of stone arrow-heads, hawks, gold, and latterly ginseng. Assuming that, as the Chinese say, the Khitans were Manchus, the first appearance of the Manchus, as a people, in China dates from the beginning of the 10th century, when the Khitans, having first conquered the kingdom of Pohai, crossed the frontier into China and established the Liao or Iron dynasty in the northern portion of the empire. These invaders were in their turn overthrown two centuries later by another invasion from Manchuria. These new conquerors were Nüchihs, and therefore direct ancestors of the Manchus. On assuming the imperial yellow in China their chief adopted the title of Kin or "Golden" for his dynasty. "Iron" (Liao), he said, "rusts, but gold always keeps its purity and colour, therefore my dynasty shall be called Kin." In a little more than a century, however, the Kins were driven out of China by the Mongols under Jenghiz Khan. But before the close of their rule a miraculous event occurred on the Chang-pai-Shan mountains which is popularly believed to have laid the seeds of the greatness of the present rulers of the empire. Three heaven-born maidens, so runs the legend, were bathing one day in a lake under the Chang-pai-Shan mountains when a passing magpie dropped a ripe red fruit into the lap of one of them. The maiden ate the fruit, and in due course a child was born to her, whom she named Aisin Gioro, or the Golden. When quite a lad Aisin Gioro was elected chief over three contending

clans, and established his capital at Otoli near the Chang-pai-Shan mountains. His reign, however, was brief, for his subjects rose and murdered him, with all his sons except the youngest, Fancha, who, like the infant Haitu in Mongolian history, was miraculously saved. Nothing is recorded of the facts of Aisin Gioro's reign except that he named the people over whom he reigned Manchu, or "Pure." His descendants, through the rescued Fancha, fell into complete obscurity until about the middle of the 16th century, when one of them, Nurhachu by name, a chieftain of a small tribe, rose to power. Nurhachu played with skill and daring the rôle which had been played by Jenghiz Khan more than three centuries before in Mongolia. With even greater success than his Mongolian counterpart, Nurhachu drew tribe after tribe under his sway, and after numerous wars with Korea and Mongolia he established his rule over the whole of Manchuria. Being thus the sovereign of an empire, he, again like Jenghiz Khan, adopted for himself the title of Ying-ming, "Brave and Illustrious," and took for his reign the title of T'ien-ming. Thirteen years later, in 1617, after numerous border fights with the Chinese, Nurhachu drew up a list of "seven hates," or indictments, against his southern neighbours, and, not getting the satisfaction he demanded, declared war against them. The progress of this war, the peace hastily patched up, the equally hasty alliance and its consequences, being matters of Chinese history, are treated in the article CHINA.

Manchuria was claimed by Russia as her particular sphere of interest towards the close of the 19th century, and in the course of the disturbances of 1900 Russian troops occupied various parts of the country. Eventually a Manchurian convention was arranged between China and Russia, by which Russia was to evacuate the province; but no actual ratification of this convention was made by Russia. The Anglo-German agreement of October 1900, to which Japan also became a party, and by which it was agreed to "maintain undiminished the territorial condition of the Chinese empire," was considered by Great Britain and Japan not to exclude Manchuria; but Germany, on the other hand, declared that Manchuria was of no interest to her. The

Anglo-Japanese treaty of 1902, however, was ostensibly directed towards the preservation of Manchuria in Chinese hands. British capital has been invested in the extension of the Chinese Northern railway to Niu-chwang, and the fact was officially recognized by an agreement between Great Britain and Russia in 1899. One result of the Russo-Japanese War was the evacuation of Manchuria by the Russians, which, after the conclusion of peace in 1905, was handed over by Japan to China.

See H. E. M. James, *The Long White Mountain* (London, 1888); D. Christie, *Ten Years in Manchuria* (Paisley, 1895); F. E. Younghusband, *The Heart of a Continent: a Narrative of Travels in Manchuria* (London, 1896); P. H. Kent, *Railway Enterprise in China* (London, 1907).

(R. K. D.)

MANCINI, PASQUALE STANISLAO

(1817-1888), Italian jurist and statesman, was born at Castel Baronia, in the province of Avellino, on the 17th of March 1817. At Naples, where he studied law and displayed great literary activity, he rapidly acquired a prominent position, and in 1848 was instrumental in persuading Ferdinand II. to participate in the war against Austria. Twice he declined the offer of a portfolio in the Neapolitan cabinet, and upon the triumph of the reactionary party undertook the defence of the Liberal political prisoners. Threatened with imprisonment in his turn, he fled to Piedmont, where he obtained a university professorship and became preceptor of the crown prince Humbert. In 1860 he prepared the legislative unification of Italy, opposed the idea of an alliance between Piedmont and Naples, and, after the fall of the Bourbons, was sent to Naples as administrator of justice, in

which capacity he suppressed the religious orders, revoked the Concordat, proclaimed the right of the state to Church property, and unified civil and commercial jurisprudence. In 1862 he became minister of public instruction in the Rattazzi cabinet, and induced the Chamber to abolish capital punishment. Thereafter, for fourteen years, he devoted himself chiefly to questions of international law and arbitration, but in 1876, upon the advent of the Left to power, became minister of justice in the Depretis cabinet. His Liberalism found expression in the extension of press freedom, the repeal of imprisonment for debt, and the abolition of ecclesiastical tithes. During the Conclave of 1878 he succeeded, by negotiations with Cardinal Pecci (afterwards Leo XIII.), in inducing the Sacred College to remain in Rome, and, after the election of the new pope, arranged for his temporary absence from the Vatican for the purpose of settling private business. Resigning office in March 1878, he resumed the practice of law, and secured the annulment of Garibaldi's marriage. The fall of Cairoli led to Mancini's appointment (1881) to the ministry of foreign affairs in the Depretis administration. The growing desire in Italy for alliance with Austria and Germany did not at first secure his approval; nevertheless he accompanied King Humbert to Vienna and conducted the negotiations which led to the informal acceptance of the Triple Alliance. His desire to retain French confidence was the chief motive of his refusal in July 1882 to share in the British expedition to Egypt, but, finding his efforts fruitless when the existence of the Triple Alliance came to be known, he veered to the English interest and obtained assent in London to the Italian expedition to Massawa. An indiscreet announcement of the limitations of the Triple Alliance contributed to his fall in June 1885, when he was succeeded by Count di Robilant. He died in Rome on the 26th of December 1888.

MANCIPLE, the official title of the caterer at a college, an inn of court, or other institution. Sometimes also the chief cook. The medieval Latin *manceps*, formed from *mancipium*, acquisition by purchase (see ROMAN LAW), meant a purchaser of stores, and *mancipium* became used of his office. It is from the latter word that the O. Fr. *manciple* is taken.

MANCUNIUM, the name often (though perhaps incorrectly) given as the Romano-British name of Manchester. Here, close to the Medlock, in the district still called Castlefield near Knott Mill, stood in Roman days a fort garrisoned by a cohort of Roman auxiliary soldiers. The site is now obscured by houses, railways and the Rochdale canal, but vestiges of Roman ramparts can still be seen, and other remains were found in 1907 and previous years. Traces of Romano-British inhabitation have been noted elsewhere in Manchester, especially near the cathedral. But there was no town here; we can trace nothing more than a fort guarding the roads running north through Lancashire and east into Yorkshire, and the dwellings of women-folk and traders which would naturally spring up outside such a fort. The ancient name

is unknown. Our Roman authorities give both Mancunium and Mamucium, but it is not clear that either form is correct.

See W. T. Watkin's *Roman Lancashire*; C. Roeder's *Roman Manchester*, and the account edited by F. Bruton of the excavations in 1907.

(F. J. H.)

MANDAEANS, also known as Sabians, Nasoraeans, or St John's Christians,[1] an Oriental sect of great antiquity, interesting to the theologian as almost the only surviving example of a religion compounded of Christian, heathen and Jewish elements on a type which is essentially that of ancient Gnosticism.

The Mandaeans are found in the marshy lands of South Babylonia (al-baṭāiḥ), particularly in the neighbourhood of Basra (or Bussorah), and in Khūzistān (Disful, Shuster).[2] They speak the languages of the localities in which they are settled (Arabic or Persian), but the language of their sacred books is an Aramaic dialect, which has its closest affinities with that of the Babylonian Talmud, written in a peculiar character suggestive of the old Palmyrene.[3] The existence of the Mandaeans has been known since the middle of the 17th century, when the first Christian missionaries, Ignatius a Jesu[4] and Angelus a Sancto, began to labour among them at Basra; further information was gathered at a somewhat later date by Pietro della Valle[5] and Jean de Thévenot[6] (1633-1667), and in the following century by Engelbrecht Kaempfer (1651-1716), Jean Chardin (1643-1713) and Carsten Niebuhr. In

recent times they have been visited by A. H. Petermann[7] and Albrecht Socin, and Siouffi[8] published in 1880 a full and accurate account of their manners and customs, taken from the lips of a converted Mandaean. For our knowledge of their doctrinal system, however, we still depend chiefly upon the sacred books already mentioned, consisting of fragments of very various antiquity derived from an older literature.[9] Of these the largest and most important is the *Sidrā rabbā* ("Great Book"), known also as *Ginzā* ("Treasure"), consisting of two unequal parts, of which the larger is called *yamīnā* (to the right hand) and the smaller *s'mala* (to the left hand), because of the manner in which they are bound together. The former is intended for the living; the latter consists chiefly of prayers to be read at the burial of priests. As regards doctrine, the work is exhaustive; but it is diffuse, obscure, and occasionally self-contradictory, as might be expected in a work which consists of a number of unconnected paragraphs of various authorship and date. The last section of the "right-hand" part (the "Book of Kings") is one of the older portions, and from its allusion to "the Persian and Arabian kings" may be dated somewhere between A.D. 700 and 900. Many of the doctrinal portions may in substance well be still older, and date from the time of the Sassanids. None of the MSS., however, is older than the 16th century.[10]

The following sketch represents, as far as can be gathered from these heterogeneous sources, the principal features of the Mandaean system. The ground and origin of all things is *Pīrā*, or more correctly *Pērā rabbā* ("the great abyss," or from פער, "to split," cf. the Gnostic βυθός, or more probably cf. Heb. *perī*, "the great fruit"), associated with whom, and forming a triad with him, are the primal aeons *Ayar zīvā rabbā*, "the great shining aether," and *Mānā rabbā d'eḳārā*, "the great spirit of glory," usually called simply *Mānā rabbā*. The last-named, the most prominent of the three, is the king of light properly so called, from whom the development of all things begins. From him emanates *Yardĕnā rabbā*, "the great Jordan," which, as the higher-world soul, permeates the whole aether, the domain of Ayar. Alongside of *Mānā rabbā* frequent mention is made of *D'mūthā*, his "image," as a female power; the

name “image of the father” arises out of the same conception as that which gives rise to the name of ἔννοια among the Greek Gnostics. *Mānā rabbā* called into being the highest of the aeons properly so called, *Hayyē Kadmāyē*, “Primal Life,” and then withdrew into deepest secrecy, visible indeed to the highest but not to the lowest aeons (cf. Σοφία and Προπάτωρ), yet manifesting himself also to the souls of the more pious of the Mandaeans after their separation from the body. Primal Life, who is properly speaking the Mandaean god, has the same predicates as the primal spirit, and every prayer, as well as every section of the sacred books, begins by invoking him.[11] The extremely fantastic delineation of the world of light by which *Hayyē Kadmāyē* is surrounded (see for example the beginning of *Sidrā rabbā*) corresponds very closely with the Manichaean description of the abode of the “king of the paradise of light.” The king of light “sits in the far north in might and glory.” The Primal Light unfolds himself by five great branches, viz. “the highest purest light, the gentle wind, the harmony of sounds, the voice of all the aeons, and the beauty of their forms,” all these being treated as abstractions and personified. Out of the further development and combination of these primary manifestations arise numerous aeons (*‘Uthrē*, “splendours,” from עתר, “is rich”), of which the number is often stated to be three hundred and sixty. They are divided into a number of classes (kings, hypostases, forms, &c.); the proper names by which they are invoked are many, and for the most part obscure, borrowed doubtless, to some extent, from the Parsee angelology. From the First Life proceeds as a principal emanation the “Second Life,” *Hayyē Tinyānē*, generally called *Yōshamīn*. This last name is evidently meant to be Hebrew, “Yahweh of the heavens,” the God of the Jews being of a secondary rank in the usual Gnostic style. The next emanation after *Yōshamīn* is “the messenger of life” (*Mandā d’hayyē*, literally γνῶσις τῆς ζωῆς), the most important figure in the entire system, the mediator and redeemer, the λόγος and the Christ of the Mandaeans, from whom, as already stated, they take their name. He belongs to the heathen Gnosis, and is in his essence the same as the Babylonian Marduk. *Yōshamīn* desired to raise himself above the Primal Light, but failed in the attempt, and was punished by removal out of the pure aetherial

world into that of inferior light. Mandā, on the other hand, continues with the First Life and *Mānā rabbā*, and is called his "beloved son," the "first born," "high priest" and "word of life." The "Life" calls into existence in the visible world a series of three great Helpers, Hibil, Shithil and Anōsh (late Judaeo-Babylonian transformations of the well-known names of the book of Genesis), the guardians of souls. The last son of the Second Life is *Hayyē t'līthayē*, the "Third Life," usually called father of the Uthrē (*Abā d' 'Uthrē*, *Abāthūr*). His usual epithet is "the Ancient" (*'Aṭīqā*), and he is also called "the deeply hidden and guarded." He stands on the borderland between the here and the hereafter, like the mysterious πρεσβύτης τρίτος or *senex tertius* of Mani, whose becoming visible will betoken the end of the world. Abāthūr sits on the farthest verge of the world of light that lies towards the lower regions, and weighs in his balance the deeds of the departed spirits who ascend to him. Beneath him was originally nothing but a huge void with muddy black water at the bottom, in which his image was reflected, becoming ultimately solidified into P'tāhīl, his son, who now partakes of the nature of matter. The demiurge of the Mandaeans, and corresponding to the Ialdabaoth of the Ophites, he at the instance of his father frames the earth and men—according to some passages in conjunction with the seven bad planetary spirits. He created Adam and Eve, but was unable to make them stand upright, whereupon Hibil, Shithil and Anōsh were sent by the First Life to infuse into their forms spirit from *Mānā rabbā* himself. Hibil, at the instance of the supreme God, also taught men about the world of light and the aeons, and especially gave them to know that not P'tāhīl but another was their creator and supreme God, who as "the great king of light, without number, without limit," stands far above him. At the same time he enjoined the pair to marry and people the world. P'tāhīl had now lost his power over men, and was driven by his father out of the world of light into a place beneath it, whence he shall at the day of judgment be raised, and after receiving baptism be made king of the 'Uthrē with divine honours.

The underworld is made up of four vestibules and three hells properly so called. The vestibules have each two rulers, Zartay and Zartanay, Hag and

Mag, Gaf and Gafan, Anatan and Kin. In the highest hell rules alone the grisly king Sh'dūm, "the warrior"; in the storey immediately beneath is Giv, "the great"; and in the lowest is Krūn or Karkūm, the oldest and most powerful of all, commonly called "the great mountain of flesh" (*Tūrā rabbā d'besrā*), but also "the first-born of darkness." In the vestibules dirty water is still to be met with, but the hells are full of scorching consuming fire, except Krūn's domain, where is nought but dust, ashes and vacancy. Into these regions descended Hibil the brilliant, in the power of *Mānā rabbā*, just as in the Manichaean mythology the "primal man," armed with the elements of the king of light, descends to a contest with the primal devil. Hibil lingers, gradually unfolding his power, in each of the vestibules, and finally passing from hell to hell reaches Karkūm. Hibil allows himself to be half swallowed by the monster, but is unhurt, and compels his antagonist to recognize the superiority of *Mānā rabbā*, the God of light, and to divulge his profoundest secret, the hidden name of darkness. Armed with this he returns through the successive hells, compelling the disclosure of every secret, depriving the rulers of their power, and barring the doors of the several regions. From the fourth vestibule he brought the female devil Rūhā, daughter of Kin, and set her over the whole four. This Rūhā, the mother of falsehood and lies, of poisoning and fornication is an anti-Christian parody of the Rūhā d'Qudshā (Holy Spirit) of the Syriac Church. She is the mother of Ur, the personified fire of hell, who in anger and pride made a violent onset on the world of light (compare the similar occurrence in the Manichaean mythology), but was mastered by Hibil and thrown in chains down to the "black water," and imprisoned within seven iron and seven golden walls. By Ur, Rūhā, while P'tāhīl was engaged in his work of creation, became mother of three sets of seven, twelve and five sons respectively; all were translated by P'tāhīl to the heavenly firmament (like the Archons of Mani), the first group forming the planets and the next the signs of the zodiac, while the third is as yet undetermined. Of the names of the planets Estera (Ishtar Venus, also called Rūhā d'Qudshā, "holy spirit"), Enba (Nebo, Mercury), Sīn (moon), Kēwān (Saturn), Bīl (Jupiter), and Nirīg (Nirgal, Mars) reveal their Babylonian origin; Il or Il Il, the sun, is also known as Ḳādūsh and

Adūnay (the Adonai of the Old Testament); as lord of the planetary spirits his place is in the midst of them; they are the source of all temptation and evil amongst men. The houses of the planets, as well as the earth and a second world immediately to the north of it, rest upon anvils laid by Hibil on the belly of Ur.

In the Mandaean representation the sky is an ocean of water, pure and clear, but of more than adamantine solidity, upon which the stars and planets sail. Its transparency allows us to see even to the pole star, who is the central sun around whom all the heavenly bodies move. Wearing a jewelled crown, he stands before Abāthūr's door at the gate of the world of light; the Mandaeans accordingly invariably pray with their faces turned northward. The earth is conceived of as a round disk, slightly sloping towards the south, surrounded on three sides by the sea, but on the north by a high mountain of turquoises; behind this is the abode of the blest, a sort of inferior paradise, inhabited by the Egyptians who were saved from drowning with Pharaoh in the Red Sea, and whom the Mandaeans look upon as their ancestors, Pharaoh himself having been their first high priest and king. The total duration of the earth they fix at four hundred and eighty thousand years, divided into seven epochs, in each of which one of the planets rules. The *Sidrā Rabbā* knows of three total destructions of the human race by fire and water, pestilence and sword, a single pair alone surviving in each case. In the Mandaean view the Old Testament saints are false prophets; such as Abraham, who arose six thousand years after Nū(Noah) during the reign of the sun, Mīshā (Moses), in whose time the true religion was professed by the Egyptians, and Shlīmūn (Solomon) bar Davith, the lord of the demons. Another false prophet and magician was Yishu M'shīhā, who was in fact a manifestation of the planet Mercury. Forty-two years before his day, under King Pontius Pilate, there had appeared the true prophet Yahyā or John son of Zechariah, an incarnation of Hibil, of whose birth and childhood fantastic stories are told. Yahyā by a mistake gave baptism to the false Messiah, who had feigned humility; on the completion of his mission, after undergoing a seeming execution, he returned clothed with light

into the kingdom of light. As a contemporary of Yahyā and the false Messiah Hibil's younger brother Anōsh 'Uthrā came down from heaven, caused himself to be baptized by Yahyā, wrought miracles of healing and of raising the dead, and brought about the crucifixion of the false Messiah. He preached the true religion, destroyed Jerusalem ("Urashlam," *i.e.* "the devil finished it"), which had been built by Adūnay, dispersed over the world the Jews who had put Yahyā to death, and previous to his return into the worlds of light sent forth three hundred and sixty prophets for the diffusion of the true religion. All this speaks of intense hatred alike of Jews and Christians; the fasts, celibacy and monastic and anchoret life of the latter are peculiarly objectionable to the Mandaeans. Two hundred and forty years after the appearing of the false Messiah there came to the world sixty thousand saints out of Pharaoh's world to take the place of the Mandaeans, who had been completely extirpated; their high priest had his residence in Damascus. The last false prophet was M'hammad or Ahmat bar Bisbat (Mahomet), but Anōsh, who remained close beside him and his immediate successors, prevented hostilities against the true believers, who claim to have had in Babylonia, under the Abbasids, four hundred places of worship. Subsequent persecutions compelled their withdrawal to 'Ammāra in the neighbourhood of Wāsit, and ultimately to Khūzistān. At the end of the world the devil Ur will swallow up the earth and the other intermediate higher worlds, and thereupon will burst and fall into the abyss of darkness where, along with all the worlds and powers of darkness, he will ultimately cease to be, so that thenceforward the universe will consist of but one everlasting world of light.

The chief depositaries of these Mandaean mysteries are the priests, who enjoy a high degree of power and social regard. The priesthood has three grades: (1) the *Sh'kandā* or deacon is generally chosen from episcopal or priestly families, and must be without bodily blemish. The candidate for orders must be at least nineteen years old and have undergone twelve years' preparation; he is then qualified to assist the priesthood in the ceremonies of religion. (2) The *Tarmīdā* (*i.e.* "Talmīdā," "initiated") or

priest is ordained by a bishop and two priests or by four priests after a long and extremely painful period of preparation. (3) The *Ganzivrā* ("treasurer") or bishop, the highest dignitary, is chosen from the whole body of the Tarmīdās after a variety of tests, and possesses unlimited authority over the clergy. A supreme priestly rank, that of *Rīsh ʿammā*, or "head of the people," is recognized, but only in theory; since the time of Pharaoh this sovereign pontificate has only once been filled. Women are admitted to priestly offices as well as men. The priestly dress, which is all white, consists of drawers, an upper garment, and a girdle with the so-called *tāgā* ("crown"); in all ceremonies the celebrants must be barefoot. By far the most frequent and important of the religious ceremonies is that of baptism (*maṣbūthā*), which is called for in a great variety of cases, not only for children but for adults, where consecration or purification is required, as for example on all Sundays and feast days, after contact with a dead body, after return from abroad, after neglect of any formality on the part of a priest in the discharge of his functions. In all these cases baptism is performed by total immersion in running water, but during the five days' baptismal festival the rite is observed wholesale by mere sprinkling of large masses of the faithful at once. The Mandaeans observe also with the elements of bread (*pehtā*) and wine (*mambūhā*, lit. "fountain") a sort of eucharist, which has a special sanctifying efficacy, and is usually dispensed at festivals, but only to baptized persons of good repute who have never willingly denied the Mandaean faith. In receiving it the communicant must not touch the host with his finger; otherwise it loses its virtue. The hosts are made by the priests from unleavened fine flour. The Mandaean places of worship, being designed only for the priests and their assistants (the worshippers remaining in the forecourt), are excessively small, and very simply furnished; two windows, a door that opens towards the south so that those who enter have their faces turned towards the pole star, a few boards in the corner, and a gabled roof complete the whole structure; there is neither altar nor decoration of any kind. The neighbourhood of running water (for baptisms) is essential. At the

consecration of a church the sacrifice of a dove (the bird of Ishtar) has place among the ceremonies. Besides Sundays there are six great feasts: (1) that of the New Year (*Naurūz rabbā*), on the first day of the first month of winter; (2) *Dehwā h'nīnā*, the anniversary of the happy return of *Hibil Zīvā* from the kingdom of darkness into that of light, lasting five days, beginning with the 18th of the first month of spring; (3) the *Marwānā*, in commemoration of the drowned Egyptians, on the first day of the second month of spring; (4) the great five days' baptismal festival (*pantshā*), the chief feast, kept on the five intercalary days at the end of the second month of summer—during its continuance every Mandaean, male and female, must dress in white and bathe thrice daily; (5) *Dehwā d'daimānā*, in honour of one of the three hundred and sixty 'Uthras, on the first day of the second month of autumn; (6) *Kanshe Zahlā*, the preparation feast, held on the last day of the year. There are also fast days called m'battal (Arab.), on which it is forbidden to kill any living thing or eat flesh. These, however, are really "rest-days," as fasting is forbidden in Mandaeism. The year is solar, and has twelve months of thirty days each, with five intercalary days between the eighth and the ninth month. Of the seven days of the week, next to Sunday (habshaba) Thursday has a special sacredness as the day of *Hibil Zīvā*. As regards secular occupation, the present Mandaeans are goldsmiths, ironworkers, and house and ship carpenters. The *Sidrā Rabbā* lays great stress upon the duty of procreation, and marriage is a duty. In the 17th century, according to the old travellers, they numbered about 20,000 families, but at the present day they hardly number more than 1200 souls. In external appearance the Mandaean is distinguished from the Moslem only by a brown coat and a parti-coloured headcloth with a cord twisted round it. They have some peculiar deathbed rites: a deacon with some attendants waits upon the dying, and as death approaches administers a bath first of warm and afterwards of cold water; a holy dress, consisting of seven pieces (rastā), is then put on; the feet are directed towards the north and the head turned

to the south, so that the body faces the pole star. After the burial a funeral feast is held in the house of mourning.

The Mandaeans are strictly reticent about their theological dogmas in the presence of strangers; and the knowledge they actually possess of these is extremely small. The foundation of the system is obviously to be sought in Gnosticism, and more particularly in the older type of that doctrine (known from the serpent symbol as Ophite or Naassene) which obtained in Mesopotamia and Further Asia generally. But it is equally plain that the Ophite nucleus has from time to time received very numerous and often curiously perverted accretions from Babylonian Judaism, Oriental Christianity and Parsism, exhibiting a striking example of religious syncretism. In the Gnostic basis itself it is not difficult to recognize the general features of the religion of ancient Babylonia, and thus we are brought nearer a solution of the problem as to the origin of Gnosticism in general. It is certain that Babylonia, the seat of the present Mandaeans, must be regarded also as the cradle in which their system was reared; it is impossible to think of them as coming from Palestine, or to attribute to their doctrines a Jewish or Christian origin. They do not spring historically from the disciples of John the Baptist (Acts xviii. 25; xix. 3 seq.; *Recog. Clem.* i. 54); the tradition in which he and the Jordan figure so largely is not original, and is therefore worthless; at the same time it is true that their baptismal praxis and its interpretation place them in the same religious group with the Hemerobaptists of Eusebius (*H. E.* iv. 22) and Epiphanius (*Haer.*, xvii.), or with the sect of disciples of John who remained apart from Christianity. Their reverence for John is of a piece with their whole syncretizing attitude towards the New Testament. Indeed, as has been seen, they appropriate the entire personale of the Bible from Adam, Seth, Abel, Enos and Pharaoh to Jesus and John, a phenomenon which bears witness to the close relations of the Mandaean doctrine both with Judaism and Christianity—not the less close because they were relations of hostility. The history of religion presents other examples of

the degradation of holy to demonic figures on occasion of religious schism. The use of the word "Jordan," even in the plural, for "sacred water," is precisely similar to that by the Naassenes described in the *Philosophumena* (v. 7); there ὁ μέγας Ἰορδάνης denotes the spiritualizing sanctifying fluid which pervades the world of light. The notions of the Egyptians and the Red Sea, according to the same work (v. 16), are used by the Peratae much as by the Mandaeans. And the position assigned by the Sethians (Σηθιανοί) to Seth is precisely similar to that given by the Mandaeans to Abel. Both alike are merely old Babylonian divinities in a new Biblical garb. The genesis of Mandaeism and the older gnosis from the old and elaborate Babylonio-Chaldaean religion is clearly seen also in the fact that the names of the old pantheon (as for example those of the planetary divinities) are retained, but their holders degraded to the position of demons—a conclusion confirmed by the fact that the Mandaeans, like the allied Ophites, Peratae and Manichaeans, certainly have their original seat in Mesopotamia and Babylonia. It seems clear that the trinity of Anu, Bel, and Ea in the old Babylonian religion has its counterpart in the Mandaean Pīrā, Ayar, and Mānā rabbā. The D'mūthā of Mānā is the Damkina, the wife of Ea, mentioned by Damascius as Δαύκη, wife of Ἀός. Mandā d'hayyē and his image Hibil Zīvā with his incarnations clearly correspond to the old Babylonian Marduk, Merodach, the "first-born" son of Ea, with his incarnations, the chief divinity of the city of Babylon, the mediator and redeemer in the old religion. Hibil's contest with darkness has its prototype in Marduk's battle with chaos, the dragon Tiamat, which (another striking parallel) partially swallows Marduk, just as is related of Hibil and the Manichaean primal man. Other features are borrowed by the Mandaean mythology under this head from the well-known epos of Istar's *descensus ad inferos*. The sanctity with which water is invested by the Mandaeans is to be explained by the fact that Ea has his seat "in the depths of the world sea."

Cf. K. Kessler's article, "Mandäer," in Herzog-Hauck's *Realencyklopädie*, and the same author's paper, "Ueber Gnosis u. altbabylonische Religion," in the *Abhandh. d. fünften internationalen Orientalisten-congresses zu Berlin* (Berlin, 1882); also W. Brandt's *Mandäische Religion* (Leipzig, 1889), and M. N. Siouffi's *Études sur la religion des Soubbas* (Paris, 1880). (K. K.; G. W. T.)

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1 The first of these names (not Mendaeans or Mandaites) is that given by themselves, and means γνωστικοί, followers of Gnosis (מאנדאייא, from מאנדא, Hebr. מדע). The Gnosis of which they profess themselves adherents is a *personification*, the æon and mediator "knowledge of life" (see below). The title Nasoraeans (Nāṣōrāyē), according to Petermann, they give only to those among themselves who are most distinguished for knowledge and character. Like the Arabic Naṣāra, it is originally identical with the name of the half heathen half Jewish-Christian Ναζωραῖοι, and indicates an early connexion with that sect. The inappropriate designation of St John's Christians arises from the early and imperfect acquaintance of Christian missionaries, who had regard merely to the reverence in which the name of the Baptist is held among them, and their frequent baptisms. In their dealings with members of other communions the designation they take is Sabians, in Arabic Ṣābi'ūna, from צבע = צבא, to baptize, thus claiming the toleration extended by the Koran (Sur, 5,.73; 22, 17; 2, 59) to those of that name.

2 In 1882 they were said to have shrunk to 200 families, and to be seeking a new settlement on the Tigris, to escape the persecutions to which they are exposed.

3 See T. Nöldeke's admirable *Mandäische Grammatik* (Halle, 1875).

4 *Narratio originis, rituum, et errorum Christianorum S. Joannis* (Rome, 1652).

5 *Reisebeschreibung*, part iv. (Geneva, 1674).

6 *Voyage au Levant* (Paris, 1664).

7 *Reisen im Orient*, ii. 447 seq.

8 M. M. Siouffi, *Études sur la religion ... des Soubbas* (Paris, 1880).

9 Mandaean MSS. occur in the British Museum, the Bodleian Library, the Bibliothèque Nationale of France, and also in Rome, Weimar and Berlin. A number of Mandaean inscriptions relating to popular beliefs and superstitions have been published by H. Pognon, *Inscriptions mandaites* (2 vols., Paris, 1898-1899), also by M. Lidzbarski in his *Ephemeris* (Giessen, 1900 seq.).

10 The first printed edition and translation of the *Sidra rabba*, by Matth. Norberg (*Codex Nazaraeus, liber Adami appellatus*, 3 vols., Copenhagen, 1815-1816, followed by a lexicon in 1816, and an onomasticon in 1817), is so defective as to be quite useless; even the name Book

of Adam is unknown to the Mandaeans. Petermann's *Thesaurus s. Liber magnus, vulgo "Liber Adami" appellatus, opus Mandaeorum summi panderis* (2 vols., Berlin and Leipzig, 1867), is an excellent metallographic reproduction of the Paris MS. A German translation of about a quarter of this work has been published in W. Brandt's *Mandäische Schriften*, with notes (Göttingen, 1893). A critical edition still remains a desideratum. Next in importance to the *Sidrā rābbā* is the *Sidrā d'Yahyā*, or "Book of John," otherwise known as the *D'rāschē d'Malkē*, "Discourses of the Kings," which has not as yet been printed as a whole, although portions nave been published by Lorsbach and Tychsen (see *Museum f. bibl. u. orient. Lit.* (1807), and Stäudlin's *Beitr. z. Phil. u. Gesch. d. Relig. u. Sittenlehre* 1796 seq.). The *Kolāstā* (Ar. *Khulāṣa*, "Quintessence"), or according to its fuller title *'Enyānē uderāshē d'maṣbūthā umasseḳthā* ("Songs and Discourses of Baptism and the Ascent," viz. of the soul after death), has been admirably lithographed by Euting (Stuttgart, 1867). It is also known as *Sidrā d'neshmātha*, "Book of Souls," and besides hymns and doctrinal discourses contains prayers to be offered by the priests at sacrifice and at meals, as well as other liturgical matter. The Mandaean marriage service occurs both in Paris and in Oxford as an independent MS. The *Dīwān*, hitherto unpublished, contains the ritual for atonement. The *Asfar malwāshē*, or "Book of the Zodiac," is astrological. Of smaller pieces many are magical and used as amulets.

11 The use of the word "life" in a personal sense is usual in Gnosticism; compare the Ζωὴ of Valentin and *el-ḥayāt el-muallama*, "the dark life," of Mani in the *Fihirst*.

MANDALAY, formerly the capital of independent Burma, now the headquarters of the Mandalay division and district, as well as the chief town in Upper Burma, stands on the left bank of the Irrawaddy, in 21° 59′ N. and 96° 8′ E. Its height above mean sea-level is 315 ft. Mandalay was built in 1856-1857 by King Mindōn. It is now divided into the municipal area and the cantonment. The town covers an area of 6 m. from north to south and 3 from east to west, and has well-metalled roads lined with avenues of trees and regularly lighted and watered. The cantonment consists of the area inside the old city walls, and is now called Fort Dufferin. In the centre stands the palace, a group of wooden buildings, many of them highly carved and gilt, resting on a brick platform 900

ft. by 500 ft., and 6 ft. high. The greater part of it is now utilized for military and other offices. The garrison consists of a brigade belonging to the Burma command of the Indian army. There are many fine pagodas and monastic buildings in the town. The population in 1901 was 183,816, showing a decrease of 3% in the decade. The population is very mixed. Besides Burmese there are Zerbadis (the offspring of a Mahommedan with a Burman wife), Mahommedans, Hindus, Jews, Chinese, Shans and Manipuris (called Kathe), Kachins and Palaungs. Trains run from Mandalay to Rangoon, Myit-kyina, and up the Mandalay-Kunlong railway. The steamers of the Irrawaddy Flotilla Company also ply in all directions. There are twenty bazaars, the chief of which, the Zegyo, was burnt in 1897, and again in 1906, but rebuilt.

The MANDALAY DISTRICT has an area of 2117 sq. m. and a population (1901) of 366,507, giving a density of 177 inhabitants to the square mile. About 600 sq. m. along the Irrawaddy river are flat land, nearly all cultivated. In the north and east there are some 1500 sq. m. of high hills and table-lands, forming geographically a portion of the Shan table-land. Here the fall to the plains averages 3000 to 4000 ft. in a distance of 10 m. This part of the district is well wooded and watered. The Maymyo subdivision has very fine plateaus of 3000 to 3600 ft. in height. The highest peaks are between 4000 and 5000 ft. above sea-level. The Irrawaddy, the Myit-ngè and the Madaya are the chief rivers. The last two come from the Shan States, and are navigable for between 20 and 30 m. There are many canals, most of which have fallen greatly into disrepair, and the Aungbinle, Nanda and Shwepyi lakes also supply water for cultivation. A systematic irrigation scheme has been undertaken by the government. The Sagyin hills near Madaya are noted for their alabaster; rubies are also found in small quantities. There are 335 sq. m. of forest reserves in the district, but there is little teak. The climate is dry and healthy. During May and June and till August strong winds prevail. The thermometer rises to about 107° in the shade in the hot weather, and the minimum in the month of December is about 55°. The rainfall is light, the average being under 30 in.

The DIVISION includes the districts of Mandalay, Bhamo, Myit-kyina, Katha and Ruby Mines, with a total area of 29,373 sq. m., and a population (1901) of 777,338, giving an average density of 30 inhabitants to the square mile.

(J. G. SC.)

MANDAMUS, WRIT OF, in English law, a high prerogative writ issuing from the High Court of Justice (named from the first word in the Latin form of the writ) containing a command in the name of the king, directed to inferior courts, corporations, or individuals, ordering them to do a specific act within the duty of their office, or which they are bound by statute to do, and performance whereof the applicant for the writ has a specific legal right to enforce. Direct orders from the sovereign to subjects commanding the performance of particular acts were common in early times, and to this class of orders *mandamus* originally belonged. It became customary for the court of king's bench, in cases where a legal duty was established but no sufficient means existed for enforcing it, to order performance by this writ. Under the Judicature Acts and the *Crown Office Rules*, 1906 (r. 49), the powers of the court of king's bench as to the grant of the prerogative writ of mandamus are exercisable only in the king's bench division of the High Court.

The writ though of right is not of course: *i.e.* the applicant cannot have it merely for the asking, but must satisfy the High Court that circumstances exist calling for its issue. The procedure regulating the grant and enforcement of the writ is determined by the *Crown Office Rules*, 1906 (rr. 49-68, 125).

Mandamus has always been regarded as an exceptional remedy to supplement the deficiencies of the common law, or defects of justice.

Where another legal or equitable remedy exists, equally appropriate, convenient, speedy, beneficial and effectual, the writ will as a rule be refused. It is occasionally granted even when a remedy by indictment is available: but is not issued unless the existence of the duty and refusal to perform it are clearly established, nor where performance in fact has become impossible. The writ is used to compel inferior courts to hear and determine according to law cases within their jurisdiction, *e.g.* where a county court or justices in petty or quarter sessions refuse to assume a jurisdiction which they possess to deal with a matter brought before them. It has in recent years been employed to compel municipal bodies to discharge their duties as to providing proper sewerage for their districts and to compel anti-vaccinationist guardians of the poor to appoint officers for the execution of the Vaccination Acts; and it is also employed to compel the promoters of railway and similar undertakings to discharge duties imposed upon them towards the public by their special acts, *e.g.* with reference to highways, &c., affected by their railways or other undertakings. The courts do not prescribe the specific manner in which the duty is to be discharged, but do not stay their hands until substantial compliance is established.

Besides the prerogative common-law writ there are a number of orders, made by the High Court under statutory authority, and described as or as being in the nature of mandamus, *e.g.* mandamus to proceed to the election of a corporate officer of a municipal corporation (Municipal Corporations Act 1882, s. 225); orders in the nature of mandamus to justices to hear and determine a matter within their jurisdiction, or to state and sign a case under the enactments relating to special cases.

At common law mandamus lies only for the performance of acts of a public or official character. The enforcement of merely private obligations, such as those arising from contracts, is not within its scope. By s. 68 of the Common Law Procedure Act 1854, the plaintiff in any action other than replevin and ejectment was empowered to claim a writ

of mandamus to compel the defendant to fulfil any duty in the fulfilment of which the plaintiff was personally interested. By s. 25 (8) of the Judicature Act 1873 a mandamus may be granted by an interlocutory order of the High Court in all cases in which it shall appear to the court just or convenient that such an order should be made. This enactment does not deal with the prerogative mandamus but empowers the king's bench and the chancery divisions to grant an interlocutory mandamus in any pending cause or matter by an order other than the final judgment and even by an order made after the judgment. S. 68 of the act of 1854 has been repealed and replaced by Order LIII. of the *Rules of the Supreme Court*. The remedy thus created is an attempt to engraft upon the old common law remedy by damages a right in the nature of specific performance of the duty in question. It is not limited to cases in which the prerogative writ would be granted; but mandamus is not granted when the result desired can be obtained by some remedy equally convenient, beneficial and effective, or a particular and different remedy is provided by statute. An action for mandamus does not lie against judicial officers such as justices. The mandamus issued in the action is no longer a writ of mandamus, but a judgment or order having effect equivalent to the writ formerly used.

Mandatory Injunction.—The High Court has a jurisdiction derived from the court of chancery to grant injunctions at the suit of the attorney-general or of private persons. Ordinarily these injunctions are in the form of prohibition or restraint and not of command. But occasionally mandatory injunctions are granted in the form of a direct command by the court.

Specific Performance.—The jurisdiction of the High Court, derived from the court of chancery, to decree specific performance of contracts has some resemblance to mandamus in the domains of public or quasi-public law.

Ireland.—The law of Ireland as to mandamus is derived from that of England, and differs therefrom only in minor details.

British Possessions.—In a British possession the power to issue the prerogative writ is usually vested in the Supreme Court by its charter or by local legislation.

United States.—The writ has passed into the law of the United States. "There is in the federal judiciary an employment of the writ substantially as the old prerogative writ in the king's bench practice, also as a mode of exercising appellate jurisdiction, also as a proceeding ancillary to a judgment previously rendered, in exercise of original jurisdiction, as when a circuit court having rendered a judgment against a county issues a mandamus requiring its officers to levy a tax to provide for the payment of the judgment." And in the various states mandamus is used under varying regulations, mandate being in some cases substituted as the name of the proceeding.

MANDAN, a tribe of North American Indians of Siouan stock. When first met they were living on the Missouri at the mouth of the Heart river. At the beginning of the 19th century they were driven up the Missouri by the Sioux. In 1845 they joined the Gros Ventres and later the Arikaras, and settled in their present position at Fort Berthold reservation, North Dakota. The Mandans have always been agricultural; they are noted for their ceremonies, and from the tattooing on face and breast were described in the sign language as "the tattooed people."

MANDARIN, the common name for all public officials in China, the Chinese name for whom is *kwan* or *kwūn*. The word comes through the Portuguese from Malay *mantri*, a counsellor or minister of state. The ultimate origin of this word is the Sanskrit root *man-*, meaning to "think," seen in "man," "mind," &c. The term "mandarin" is not, in its western usage, applied indiscriminately to all civil and military officials, but only to those who are entitled to wear a "button," which is a spherical knob, about an inch in diameter, affixed to the top of the official cap or hat. These officials, civil and military alike, are divided into nine grades or classes, each grade being distinguished by a button of a particular colour. The grade to which an official belongs is not necessarily related to the office he holds. The button which distinguishes the first grade is a transparent red stone; the second grade, a red coral button; the third, a sapphire; the fourth, a blue opaque stone; the fifth, a crystal button; the sixth, an opaque white shell button; the seventh, a plain gold button; the eighth, a worked gold button; and the ninth, a worked silver button. The mandarins also wear certain insignia embroidered on their official robes, and have girdle clasps of different material. The first grade have, for civilians an embroidered Manchurian crane on the breast and back, for the military an embroidered unicorn with a girdle clasp of jade set in rubies. The second grade, for civilians an embroidered golden pheasant, for the military a lion with a girdle clasp of gold set in rubies. The third grade, for civilians a peacock, for the military a leopard with a clasp of worked gold. The fourth grade, for civilians a wild goose, for the military a tiger, and a clasp of worked gold with a silver button. The fifth grade, for civilians a silver pheasant, for the military a bear and a clasp of plain gold with a silver button. The sixth grade,

for civilians an egret, for the military a tiger-cat with a mother-of-pearl clasp. The seventh grade, for civilians a mandarin duck, for the military a mottled bear with a silver clasp. The eighth grade, for civilians a quail, for the military a seal with a clear horn clasp. The ninth grade, for civilians a long-tailed jay, for the military a rhinoceros with a buffalo-horn clasp.

The "mandarin language" is the Chinese, which is spoken in official and legal circles; it is also spoken over a considerable portion of the country, particularly the northern and central parts, though not perhaps with the same purity. Mandarin duck (*anas galericulata*) and Mandarin orange (*citrus nobilis*) possibly derive their names, by analogy, from the sense of superiority implied in the title "mandarin."

See *Society in China*, by Sir R. K. Douglas; *L'Empire du milieu*, by E. and O. Reclus.

MANDASOR, or MANDSAUR, a town of Central India, in the native state of Gwalior, on the Rajputana railway, 31 m. S. of Neemuch. Pop. (1901), 20,936. It gave its name to the treaty with Holkar, which concluded the Mahratta-Pindari War in 1818. It is a centre of the Malwa opium trade.

Mandasor and its neighbourhood are full of archaeological interest. An inscription discovered near the town indicated the erection of a temple of the sun in 437, and at Sondani are two great monolith pillars recording a victory of Yasodharma, king of Malwa, in 528. The fort dates from the 14th and 15th

centuries. Hindu and Jain remains are numerous, though the town is now entirely Mahommedan.

MANDATE (*Mandatum*), a contract in Roman law constituted by one person (the *mandatarius*) promising to do something gratuitously at the request of another (the *mandator*), who undertakes to indemnify him against loss. The jurist distinguished the different cases of mandatum according as the object of the contract was the benefit of the mandator or a third person singly, or the mandator and a third person, the mandator and the mandatarius, or the mandatarius and a third person together. When the benefit was that of the mandatarius alone, the obligations of the contract were held not to arise, although the form of the contract might exist, the commission being held to be merely advice tendered to the mandatarius, and acted on by him at his own risk. Mandatum was classified as one of the contracts established by consent of the parties alone; but, as there was really no obligation of any kind until the mandatarius had acted on the mandate, it has with more propriety been referred to the contracts created by the supply of some fact (*re*). The obligations of the mandatarius under the contract were, briefly, to do what he had promised according to his instructions, observing ordinary diligence in taking care of any property entrusted to him, and handing over to his principal the results of his action, including the right to sue in his name. On the other hand, the principal was bound to recoup him his expenses and indemnify him against loss through obligations he might have incurred.

The essentials and the terminology of the contract are preserved in most modern systems of law. But in English law mandate, under that name, can

hardly be said to exist as a separate form of contract. To some extent the law of mandatum corresponds partly to the law of principal and agent, partly to that of principal and surety. "Mandate" is retained to signify the contract more generally known as gratuitous bailment. It is restricted to personal property, and it implies the delivery of something to the bailee, both of which conditions are unknown in the mandatum of the civil law (see BAILMENT).

MANDAUE, a town of the province of Cebú, island of Cebú, Philippine Islands, on the E. coast and E. coast road, about 4 m. N.E. of the town of Cebú, the capital. Pop. (1903), 11,078; in the same year the town of Consolación (pop. 5511) was merged with Mandaue. Its climate is very hot, but healthy. The principal industries are the raising of Indian corn and sugar-cane and the manufacture of salt from sea-water. Cebú-Visayan is the language.

MANDELIC ACID (Phenylglycollic Acid), $C_8H_8O_3$ or $C_6H_5 \cdot CH(OH) \cdot COOH$, an isomer of the cresotinic and the oxymethylbenzoic acids. Since the molecule contains an asymmetric carbon atom, the acid exists

in three forms, one being an inactive “racemic” mixture, and the other two being optically active forms. The inactive variety is known as *paramandelic acid*. It may be prepared by the action of hydrochloric acid on the addition compound of benzaldehyde and hydrocyanic acid:—

$$C_6H_5CHO + HCN + HCl + 2H_2O = C_6H_5 \cdot CHOH \cdot COOH + NH_4Cl,$$

(F. L. Winckler, *Ann.*, 1836, 18, 310), by boiling phenylchlor-acetic acid with alkalis (A. Spiegel, *Ber.*, 1881, 14, 239), by heating benzoylformaldehyde with alkalis (H. v. Pechmann, *Ber.*, 1887, 20, 2905), and by the action of dilute alkalies on ω-dibromacetophenone (C. Engler, *Ber.*, 1887, 20, 2202):—

$$C_6H_5COCHBr_2 + 3KHO = 2KBr + H_2O + C_6H_5 \cdot CHOH \cdot CO_2K.$$

It crystallizes from water in large rhombic crystals, which melt at 118° C. Oxidizing agents convert it into benzaldehyde. When heated with hydriodic acid and phosphorus it forms phenylacetic acid; whilst concentrated hydrobromic acid and hydrochloric acid at moderate temperatures convert it into phenylbrom- and phenylchlor-acetic acids. The inactive mixture may be resolved into its active components by fractional crystallization of the cinchonine salt, when the salt of the *dextro* modification separates first; or the ammonium salt may be fermented by *Penicillium glaucum*, when the *laevo* form is destroyed and the *dextro* form remains untouched; on the other hand, *Saccharomyces ellipsoïdeus* destroys the *dextro* form, but does not touch the *laevo* form. A mixture of the two forms in equivalent quantities produces the inactive variety, which is also obtained when either form is heated for some hours to 160° C.

MANDER, CAREL VAN (1548-1606), Dutch painter, poet and biographer, was born of a noble family at Meulebeke. He studied under Lucas de Heere at Ghent, and in 1568-1569 under Pieter Vlerick at Kortryck. The next five years he devoted to the writing of religious plays for which he also painted the scenery. Then followed three years in Rome (1574-1577), where he is said to have been the first to discover the catacombs. On his return journey he passed through Vienna, where, together with the sculptor Hans Mont, he made the triumphal arch for the entry of the emperor Rudolph. After many vicissitudes caused by war, loss of fortune and plague, he settled at Haarlem where, in conjunction with Goltzius and Cornelisz, he founded a successful academy of painting. His fame is, however, principally based upon a voluminous biographical work on the paintings of various epochs—a book that has become for the northern countries what Vasari's *Lives of the Painters* became for Italy. It was completed in 1603 and published in 1604, in which year Van Mander removed to Amsterdam, where he died in 1606.

MANDEVILLE, BERNARD DE (1670-1733), English philosopher and satirist, was born at Dordrecht, where his father practised as a physician. On leaving the Erasmus school at Rotterdam he gave proof of his ability by an *Oratio scholastica de medicina* (1685), and at Leiden University in 1689 he maintained a thesis *De brutorum operationibus*, in which he advocated the Cartesian theory of automatism among animals. In 1691 he took his medical degree, pronouncing an "inaugural disputation," *De chylosi vitiata*. Afterwards he came to England "to learn the language," and succeeded so remarkably that many refused to believe he was a foreigner. As a physician he

seems to have done little, and lived poorly on a pension given him by some Dutch merchants and money which he earned from distillers for advocating the use of spirits. His conversational abilities won him the friendship of Lord Macclesfield (chief justice 1710-1718) who introduced him to Addison, described by Mandeville as "a parson in a tye-wig." He died in January (19th or 21st) 1733/4 at Hackney.

The work by which he is known is the *Fable of the Bees*, published first in 1705 under the title of *The Grumbling Hive, or Knaves Turn'd Honest* (two hundred doggerel couplets). In 1714 it was republished anonymously with *Remarks* and *An Enquiry into the Origin of Moral Virtue*. In 1723 a later edition appeared, including *An Essay on Charity and Charity Schools*, and *A Search into the Nature of Society*. The book was primarily written as a political satire on the state of England in 1705, when the Tories were accusing Marlborough and the ministry of advocating the French War for personal reasons. The edition of 1723 was presented as a nuisance by the Grand Jury of Middlesex, was denounced in the *London Journal* by "Theophilus Philo-Britannus," and attacked by many writers, notably by Archibald Campbell (1691-1756) in his *Aretelogia* (published as his own by Alexander Innes in 1728; afterwards by Campbell, under his own name, in 1733, as *Enquiry into the Original of Moral Virtue*). The *Fable* was reprinted in 1729, a ninth edition appeared in 1755, and it has often been reprinted in more recent times. Berkeley attacked it in the second dialogue of the *Alciphron* (1732) and John Brown criticized him in his *Essay upon Shaftesbury's Characteristics* (1751).

Mandeville's philosophy gave great offence at the time, and has always been stigmatized as false, cynical and degrading. His main thesis is that the actions of men cannot be divided into lower and higher. The higher life of man is merely a fiction introduced by philosophers and rulers to simplify government and the relations of society. In fact, virtue (which he defined as "every performance by which man, contrary to the impulse of nature, should endeavour the benefit of others, or the conquest of his own passions, out of a rational ambition of being good") is actually detrimental to the state in its

commercial and intellectual progress, for it is the vices (*i.e.* the self-regarding actions of men) which alone, by means of inventions and the circulation of capital in connexion with luxurious living, stimulate society into action and progress. In the *Fable* he shows a society possessed of all the virtues "blest with content and honesty," falling into apathy and utterly paralyzed. The absence of self-love (cf. Hobbes) is the death of progress. The so-called higher virtues are mere hypocrisy, and arise from the selfish desire to be superior to the brutes. "The moral virtues are the political offspring which flattery begot upon pride." Similarly he arrives at the great paradox that "private vices are public benefits." But his best work and that in which he approximates most nearly to modern views is his account of the origin of society. His *a priori* theories should be compared with Maine's historical inquiries (*Ancient Law*, c. V.). He endeavours to show that all social laws are the crystallized results of selfish aggrandizement and protective alliances among the weak. Denying any form of moral sense or conscience, he regards all the social virtues as evolved from the instinct for self-preservation, the give-and-take arrangements between the partners in a defensive and offensive alliance, and the feelings of pride and vanity artificially fed by politicians, as an antidote to dissension and chaos. Mandeville's ironical paradoxes are interesting mainly as a criticism of the "amiable" idealism of Shaftesbury, and in comparison with the serious egoistic systems of Hobbes and Helvetius. It is mere prejudice to deny that Mandeville had considerable philosophic insight; at the same time he was mainly negative or critical, and, as he himself said, he was writing for "the entertainment of people of knowledge and education." He may be said to have cleared the ground for the coming utilitarianism.

WORKS.—*Typhon: a Burlesque Poem* (1704); *Aesop Dress'd, or a Collection of Fables writ in Familiar Verse* (1704); *The Planter's Charity* (1704); *The Virgin Unmasked* (1709, 1724, 1731, 1742), a work in which the coarser side of his nature is prominent; *Treatise of the Hypochondriack and Hysterick Passions* (1711, 1715, 1730) admired by Johnson (Mandeville here protests against merely speculative therapeutics, and

advances fanciful theories of his own about animal spirits in connexion with "stomachic ferment": he shows a knowledge of Locke's methods, and an admiration for Sydenham); *Free Thoughts on Religion* (1720); *A Conference about Whoring* (1725); *An Enquiry into the Causes of the Frequent Executions at Tyburn* (1725); *The Origin of Honour and the Usefulness of Christianity in War* (1732). Other works attributed, wrongly, to him are *A Modest Defence of Public Stews* (1724); *The World Unmasked* (1736) and *Zoologia medicinalis hibernica* (1744).

See Hill's *Boswell*, iii. 291-293; L. Stephen's *English Thought in the Eighteenth Century*, A. Bain's *Moral Science* (593-598); Windelband's *History of Ethics* (Eng. trans. Tufts); J. M. Robertson, *Pioneer Humanists* (1907); P. Sakmann, *Bernard de Mandeville und die Bienenfabel-Controverse* (Freiburg i/Br., 1897), and compare articles ETHICS, SHAFTESBURY, HOBBES.

(J. M. M.)

MANDEVILLE, GEOFFREY DE (d. 1144), earl of Essex, succeeded his father, William, as constable of the Tower of London in or shortly before 1130. Though a great Essex landowner, he played no conspicuous part in history till 1140, when Stephen created him earl of Essex in reward for his services against the empress Matilda. After the defeat and capture of Stephen at Lincoln (1141) the earl deserted to Matilda, but before the end of the year, learning that Stephen's release was imminent, returned to his original allegiance. In 1142 he was again intriguing with the empress; but before he could openly join her cause he was detected and deprived of his castles by the king. In 1143-1144 Geoffrey maintained himself as a rebel and a

bandit in the fen-country, using the Isle of Ely and Ramsey Abbey as his headquarters. He was besieged by Stephen in the fens, and met his death in September 1144 in consequence of a wound received in a skirmish. His career is interesting for two reasons. The charters which he extorted from Stephen and Matilda illustrate the peculiar form taken by the ambitions of English feudatories. The most important concessions are grants of offices and jurisdictions which had the effect of making Mandeville a viceroy with full powers in Essex, Middlesex and London, and Hertfordshire. His career as an outlaw exemplifies the worst excesses of the anarchy which prevailed in some parts of England during the civil wars of 1140-1147, and it is probable that the deeds of Mandeville inspired the rhetorical description, in the Peterborough Chronicle of this period, when "men said openly that Christ and his saints were asleep."

See J. H. Round, *Geoffrey de Mandeville, a Study of the Anarchy* (London, 1892).

(H. W. C. D.)

MANDEVILLE, JEHAN DE ("Sir John Mandeville"), the name claimed by the compiler of a singular book of travels, written in French, and published between 1357 and 1371. By aid of translations into many other languages it acquired extraordinary popularity, while a few interpolated words in a particular edition of an English version gained for Mandeville in modern times the spurious credit of being "the father of English prose."

In his preface the compiler calls himself a knight, and states that he was born and bred in England, of the town of St Albans; had crossed the sea on

Michaelmas Day 1322; had travelled by way of Turkey (Asia Minor), Armenia the little (Cilicia) and the great, Tartary, Persia, Syria, Arabia, Egypt upper and lower, Libya, great part of Ethiopia, Chaldaea, Amazonia, India the less, the greater and the middle, and many countries about India; had often been to Jerusalem, and had written in Romance as more generally understood than Latin. In the body of the work we hear that he had been at Paris and Constantinople; had served the sultan of Egypt a long time in his wars against the Bedawin, had been vainly offered by him a princely marriage and a great estate on condition of renouncing Christianity, and had left Egypt under sultan Melech Madabron, *i.e.* Muzaffar or Mudhaffar[1] (who reigned in 1346-1347); had been at Mount Sinai, and had visited the Holy Land with letters under the great seal of the sultan, which gave him extraordinary facilities; had been in Russia, Livonia, Cracow, Lithuania, "en roialme daresten" (? de Daresten or Silistria), and many other parts near Tartary, but not in Tartary itself; had drunk of the well of youth at Polombe (Quilon on the Malabar coast), and still seemed to feel the better; had taken astronomical observations on the way to Lamory (Sumatra), as well as in Brabant, Germany, Bohemia and still farther north; had been at an isle called Pathen in the Indian Ocean; had been at Cansay (Hangchow-fu) in China, and had served the emperor of China fifteen months against the king of Manzi; had been among rocks of adamant in the Indian Ocean; had been through a haunted valley, which he places near "Milstorak" (*i.e.* Malasgird in Armenia); had been driven home against his will in 1357 by arthritic gout; and had written his book as a consolation for his "wretched rest." The paragraph which states that he had had his book confirmed at Rome by the pope is an interpolation of the English version.

Part at least of the personal history of Mandeville is mere invention. Nor is any contemporary corroboration of the existence of such a Jehan de Mandeville known. Some French MSS., not contemporary, give a Latin letter of presentation from him to Edward III., but so vague that it might have been penned by any writer on any subject. It is in fact beyond reasonable doubt that

the travels were in large part compiled by a Liége physician, known as Johains à le Barbe or Jehan à la Barbe, otherwise Jehan de Bourgogne.

The evidence of this is in a modernized extract quoted by the Liége herald, Louis Abry[2] (1643-1720), from the lost fourth book of the *Myreur des Hystors* of Johans des Preis, styled d'Oultremouse. In this "Jean de Bourgogne, dit à la Barbe," is said to have revealed himself on his deathbed to d'Oultremouse, whom he made his executor, and to have described himself in his will as "messire Jean de Mandeville, chevalier, comte de Montfort en Angleterre et seigneur de l'isle de Campdi et du château Pérouse." It is added that, having had the misfortune to kill an unnamed count in his own country, he engaged himself to travel through the three parts of the world, arrived at Liége in 1343, was a great naturalist, profound philosopher and astrologer, and had a remarkable knowledge of physic. And the identification is confirmed by the fact that in the now destroyed church of the Guillelmins was a tombstone of Mandeville, with a Latin inscription stating that he was otherwise named "ad Barbam," was a professor of medicine, and died at Liége on the 17th of November 1372: this inscription is quoted as far back as 1462.

Even before his death the Liége physician seems to have confessed to a share in the composition of the work. In the common Latin abridged version of it, at the end of c. vii., the author says that when stopping in the sultan's court at Cairo he met a venerable and expert physician of "our" parts, that they rarely came into conversation because their duties were of a different kind, but that long afterwards at Liége he composed this treatise at the exhortation and with the help (*hortatu et adiutorio*) of the same venerable man, as he will narrate at the end of it. And in the last chapter he says that in 1355, in returning home, he came to Liége, and being laid up with old age and arthritic gout in the street called Bassesauenyr, *i.e.* Basse Savenir, consulted the physicians. That one came in who was more venerable than the others by reason of his age and white hairs, was evidently expert in his art, and was commonly called Magister Iohannes ad Barbam. That a chance remark of the latter caused the

renewal of their old Cairo acquaintance, and that Ad Barbam, after showing his medical skill on Mandeville, urgently begged him to write his travels; "and so at length, by his advice and help, *monitu et adiutorio*, was composed this treatise, of which I had certainly proposed to write nothing until at least I had reached my own parts in England." He goes on to speak of himself as being now lodged in Liége, "which is only two days distant from the sea of England"; and it is stated in the colophon (and in the MSS.) that the book was first published in French by Mandeville, its author, in 1355, at Liége, and soon after in the same city translated into "the said" Latin form. Moreover, a MS. of the French text extant at Liége about 1860[3] contained a similar statement, and added that the author lodged at a hostel called "al hoste Henkin Levo": this MS. gave the physician's name as "Johains de Bourgogne dit ale barbe," which doubtless conveys its local form.

There is no contemporary English mention of any English knight named Jehan de Mandeville, nor are the arms said to have been on the Liége tomb like any known Mandeville arms. But Dr G. F. Warner has ingeniously suggested that de Bourgogne may be a certain Johan de Bourgoyne, who was pardoned by parliament on the 20th of August 1321 for having taken part in the attack on the Despensers, but whose pardon was revoked in May 1322, the year in which "Mandeville" professes to have left England. And it should now be added that among the persons similarly pardoned *on the recommendation of the same nobleman* was a Johan Mangevilayn, whose name appears closely related to that of "de Mandeville"[4]—which is merely a later form of "de Magneville."

Mangeuilain occurs in Yorkshire as early as 16 Hen. I. (*Pipe Roll Soc.*, xv. 40), but is very rare, and (failing evidence of any place named Mangeville) seems to be merely a variant spelling of Magnevillain. The meaning may be simply "of Magneville," *de* Magneville; but the family of a 14th century bishop of Nevers were called both "Mandevilain" and "de Mandevilain"—where Mandevilain seems a derivative place-name, meaning the Magneville or Mandeville district. In any case it is clear that the name "de Mandeville" might

be suggested to de Bourgogne by that of his fellow-culprit Mangevilayn, and it is even possible that the two fled to England together, were in Egypt together, met again at Liége, and shared in the compilation of the *Travels*.

Whether after the appearance of the *Travels* either de Bourgogne or "Mangevilayn" visited England is very doubtful. St Albans Abbey had a sapphire ring, and Canterbury a crystal orb, said to have been given by Mandeville; but these might have been sent from Liége, and it will appear later that the Liége physician possessed and wrote about precious stones. St Albans also had a legend that a ruined marble tomb of Mandeville (represented cross-legged and in armour, with sword and shield) once stood in the abbey; this may be true of "Mangevilayn" or it may be a mere myth.

It is a little curious that the name preceding Mangevilayn in the list of persons pardoned is "Johan le Barber." Did this suggest to de Bourgogne the *alias* "à le Barbe," or was that only a Liége nickname? Note also that the arms on Mandeville's tomb were borne by the Tyrrells of Hertfordshire (the county in which St Albans lies); for of course the crescent on the lion's breast is only the "difference" indicating a second son.

Leaving this question, there remains the equally complex one whether the book contains any facts and knowledge acquired by actual travels and residence in the East. Possibly it may, but only as a small portion of the section which treats of the Holy Land and the ways of getting thither, of Egypt, and in general of the Levant. The prologue, indeed, points almost exclusively to the Holy Land as the subject of the work. The mention of more distant regions comes in only towards the end of this prologue, and (in a manner) as an afterthought.

By far the greater part of these more distant travels, extending in fact from Trebizond to Hormuz, India, the Malay Archipelago, and China, and back again to western Asia, has been appropriated from the narrative of Friar Odoric (written in 1330). These passages, as served up by Mandeville, are almost

always, indeed, swollen with interpolated particulars, usually of an extravagant kind, whilst in no few cases the writer has failed to understand the passages which he adopts from Odoric and professes to give as his own experiences. Thus (p. 209),[5] where Odoric has given a most curious and veracious account of the Chinese custom of employing tame cormorants to catch fish, the cormorants are converted by Mandeville into "little beasts called *loyres* (*layre*, B), which are taught to go into the water" (the word *loyre* being apparently used here for "otter," *lutra*, for which the Provençal is *luria* or *loiria*).

At a very early date the coincidence of Mandeville's stories with those of Odoric was recognized, insomuch that a MS. of Odoric which is or was in the chapter library at Mainz begins with the words: *Incipit Itinerarius fidelis fratris Odorici socii Militis Mendavil per Indian; licet hic* [read *ille*] *prius el alter posterius peregrinationem suam descripsit.* At a later day Sir T. Herbert calls Odoric "travelling companion of our Sir John"; and Purchas, with most perverse injustice, whilst calling Mandeville, next to Polo, "if next ... the greatest Asian traveller that ever the world had," insinuates that Odoric's story was stolen from Mandeville's. Mandeville himself is crafty enough, at least in one passage, to anticipate criticism by suggesting the probability of his having travelled with Odoric (see p. 282 and below).

Much, again, of Mandeville's matter, particularly in Asiatic geography and history, is taken bodily from the *Historiae Orientis* of Hetoum, an Armenian of princely family, who became a monk of the Praemonstrant order, and in 1307 dictated this work on the East, in the French tongue at Poitiers, out of his own extraordinary acquaintance with Asia and its history in his own time.

It is curious that no passage in Mandeville can be plausibly traced to Marco Polo, with one exception. This is (p. 163) where he states that at Hormuz the people during the great heat lie in water—a circumstance mentioned by Polo, though not by Odoric. We should suppose it most likely that this fact had been interpolated in the copy of Odoric used by Mandeville, for if he had borrowed it direct from Polo he would have borrowed more.

A good deal about the manners and customs of the Tatars is demonstrably derived from the famous work of the Franciscan Ioannes de Plano Carpini, who went as the pope's ambassador to the Tatars in 1245-1247; but Dr Warner considers that the immediate source for Mandeville was the *Speculum historiale* of Vincent de Beauvais. Though the passages in question are all to be found in Plano Carpini more or less exactly, the expression is condensed and the order changed. For examples compare Mandeville, p. 250, on the tasks done by Tatar women, with Plano Carpini, p. 643;[6] Mandeville, p. 250, on Tatar habits of eating, with Plano Carpini, pp. 639-640; Mandeville, p. 231, on the titles borne on the seals of the Great Khan, with Plano Carpini, p. 715, &c.

The account of Prester John is taken from the famous *Epistle* of that imaginary potentate, which was so widely diffused in the 13th century, and created that renown which made it incumbent on every traveller in Asia to find some new tale to tell of him. Many fabulous stories, again, of monsters, such as cyclopes, sciapodes, hippopodes, monoscelides, anthropophagi, and men whose heads did grow beneath their shoulders, of the phoenix and the weeping crocodile, such as Pliny has collected, are introduced here and there, derived no doubt from him, Solinus, the bestiaries, or the *Speculum naturale* of Vincent de Beauvais. And interspersed, especially in the chapters about the Levant, are the stories and legends that were retailed to every pilgrim, such as the legend of Seth and the grains of paradise from which grew the wood of the cross, that of the shooting of old Cain by Lamech, that of the castle of the sparrow-hawk (which appears in the tale of Melusina), those of the origin of the balsam plants at Maṭarīya, of the dragon of Cos, of the river Sabbation, &c.

Even in that part of the book which might be supposed to represent some genuine experience there are the plainest traces that another work has been made use of, more or less—we might almost say as a framework to fill up. This is the itinerary of the German knight Wilhelm von Boldensele, written in 1336 at the desire of Cardinal Talleyrand de Perigord.[7] A cursory comparison of this with Mandeville leaves no doubt that the latter has followed its thread,

though digressing on every side, and too often eliminating the singular good sense of the German traveller. We may indicate as examples Boldensele's account of Cyprus (Mandeville, p. 28 and p. 10), of Tyre and the coast of Palestine (Mandeville, 29, 30, 33, 34), of the journey from Gaza to Egypt (34), passages about Babylon of Egypt (40), about Mecca (42), the general account of Egypt (45), the pyramids (52), some of the wonders of Cairo, such as the slave-market, the chicken-hatching stoves, and the apples of paradise, *i.e.* plantains (49), the Red Sea (57), the convent on Sinai (58, 60), the account of the church of the Holy Sepulchre (74-76), &c. There is, indeed, only a small residuum of the book to which genuine character, as containing the experiences of the author, can possibly be attributed. Yet, as has been intimated, the borrowed stories are frequently claimed as such experiences. In addition to those already mentioned, he alleges that he had witnessed the curious exhibition of the garden of transmigrated souls (described by Odoric) at Cansay, *i.e.* Hangchow-fu (211). He and his fellows with their valets had remained fifteen months in service with the emperor of Cathay in his wars against the king of Manzi—Manzi, or Southern China, having ceased to be a separate kingdom some seventy years before the time referred to. But the most notable of these false statements occurs in his adoption from Odoric of the story of the Valley Perilous (282). This is, in its original form, apparently founded on real experiences of Odoric viewed through a haze of excitement and superstition. Mandeville, whilst swelling the wonders of the tale with a variety of extravagant touches, appears to safeguard himself from the reader's possible discovery that it was stolen by the interpolation: "And some of our fellows accorded to enter, and some not. So there were with us two worthy men, Friars Minor, that were of Lombardy, who said that if any man would enter they would go in with us. And when they had said so, upon the gracious trust of God and of them, we caused mass to be sung, and made every man to be shriven and houselled; and then we entered, fourteen persons; but at our going out we were but nine," &c.

In referring to this passage it is only fair to recognize that the description (though the suggestion of the greatest part exists in Odoric) displays a good deal of imaginative power; and there is much in the account of Christian's passage through the Valley of the Shadow of Death, in Bunyan's famous allegory, which indicates a possibility that John Bunyan may have read and remembered this episode either in Mandeville or in Hakluyt's Odoric.

Nor does it follow that the whole work is borrowed or fictitious. Even the great Moorish traveller Ibn Batuta, accurate and veracious in the main, seems —in one part at least of his narrative—to invent experiences; and in such works as those of Jan van Hees and Arnold von Harff we have examples of pilgrims to the Holy Land whose narratives begin apparently in sober truth, and gradually pass into flourishes of fiction and extravagance. So in Mandeville also we find particulars not yet traced to other writers, and which may therefore be provisionally assigned either to the writer's own experience or to knowledge acquired by colloquial intercourse in the East.

It is difficult to decide on the character of his statements as to recent Egyptian history. In his account of that country (pp. 37, 38) though the series of the Comanian (*i.e.* of the Bahri Mameluke) sultans is borrowed from Hetoum down to the accession of *Melechnasser*, *i.e.* Malik al-Nāṣir (Nāṣir ud-din Mahommed), who came first to the throne in 1293, Mandeville appears to speak from his own knowledge when he adds that this "*Melechnasser* reigned long and governed wisely." In fact, though twice displaced in the early part of his life, Malik Nāṣir reigned till 1341, a duration unparalleled in Mahommedan Egypt, whilst we are told that during the last thirty years of his reign Egypt rose to a high pitch of wealth and prosperity. Mandeville, however, then goes on to say that his eldest son, *Melechemader*, was chosen to succeed; but this prince was caused privily to be slain by his brother, who took the kingdom under the name of *Melechmadabron*. "And he was Soldan when I departed from those countries." Now Malik Nāṣir Mahommed was followed in succession by no less than eight of his sons in thirteen years, the first three of whom reigned in aggregate only a few months. The names mentioned by

Mandeville appear to represent those of the fourth and sixth of the eight, viz. Ṣaliḥ ‘Imād ud-din Ismā’īl, and Moẓaffar (Saif ud-din Ḥajjī); and these the statements of Mandeville do not fit.

On several occasions Arabic words are given, but are not always recognizable, owing perhaps to the carelessness of copyists in such matters. Thus, we find (p. 50) the names (not satisfactorily identified) of the wood, fruit and sap of the balsam plant; (p. 99) of bitumen, “alkatran” (*al-Kāṭrān*); (p. 168) of the three different kinds of pepper (long pepper, black pepper and white pepper) as *sorbotin*, *fulful* and *bano* or *bauo* (*fulful* is the common Arabic word for pepper; the others have not been satisfactorily explained). But these, and the particulars of his narrative for which no literary sources have yet been found, are too few to constitute a proof of personal experience.

Mandeville, again, in some passages shows a correct idea of the form of the earth, and of position in latitude ascertained by observation of the pole star; he knows that there are antipodes, and that if ships were sent on voyages of discovery they might sail round the world. And he tells a curious story, which he had heard in his youth, how a worthy man did travel ever eastward until he came to his own country again (p. 183). But he repeatedly asserts the old belief that Jerusalem was in the centre of the world (79, 183), and maintains in proof of this that at the equinox a spear planted erect in Jerusalem casts no shadow at noon, which, if true, would equally consist with the sphericity of the earth, provided that the city were on the equator.

The sources of the book, which include various authors besides those whom we have specified, have been laboriously investigated by Dr Albert Bovenschen[8] and Dr G. F. Warner,[9] and to them the reader must be referred for more detailed information on the subject.

The oldest known MS. of the original—once Barrois’s, afterwards the earl of Ashburnham’s, now Nouv. Acq. Franç. 4515 in the Bibliothèque Nationale, Paris—is dated 1371, but is nevertheless very inaccurate in

proper names. An early printed Latin translation made from the French has been already quoted, but four others, unprinted, have been discovered by Dr J. Vogels.[10] They exist in eight MSS., of which seven are in Great Britain, while the eighth was copied by a monk of Abingdon; probably, therefore, all these unprinted translations were executed in this country. From one of them, according to Dr Vogels,[11] an English version was made which has never been printed and is now extant only in free abbreviations, contained in two 15th century MSS. in the Bodleian Library, Oxford—MS. e Museo 116, and MS. Rawlinson D. 99: the former, which is the better, is in Midland dialect, and may possibly have belonged to the Augustinian priory of St Osyth in Essex, while the latter is in Southern dialect.

The first English translation direct from the French was made (at least as early as the beginning of the 15th century) from a MS. of which many pages were lost.[12] Writing of the name Califfes (Khalif), the author says (*Roxburghe Club ed.*, p. 18) that it is *tant a dire come roi(s). Il y soleit auoir v. soudans*—"as much as to say king. There used to be 5 sultans." In the defective French MS. a page ended with *Il y so*; then came a gap, and the next page went on with part of the description of Mount Sinai, *Et est celle vallee mult froide* (ibid. p. 32). Consequently the corresponding English version has "That ys to say amonge hem *Roys Ils* and this vale ys ful colde"! All English printed texts before 1725, and Ashton's 1887 edition, follow these defective copies, and in only two known MSS. has the lacuna been detected and filled up.

One of them is the British Museum MS. Egerton 1982 (Northern dialect, about 1410-1420?), in which, according to Dr Vogels, the corresponding portion has been borrowed from that English version which had already been made from the Latin. The other is in the British Museum MS. Cotton Titus C. xvi. (Midland dialect, about 1410-1420?), representing a text completed, and revised throughout, from the French,

though not by a competent hand. The Egerton text, edited by Dr G. F. Warner, has been printed by the Roxburghe Club, while the Cotton text, first printed in 1725 and 1727, is in modern reprints the current English version.

That none of the forms of the English version can be from the same hand which wrote the original is made patent by their glaring errors of translation, but the Cotton text asserts in the preface that it was made by Mandeville himself, and this assertion was till lately taken on trust by almost all modern historians of English literature. The words of the original "je eusse cest livret mis en latin ... mais ... je l'ay mis en rōmant" were mistranslated as if "je eusse" meant "I had" instead of "I should have," and then (whether of fraudulent intent or by the error of a copyist thinking to supply an accidental omission) the words were added "and translated it agen out of Frensche into Englyssche." Mātzner (*Altenglische Sprachproben*, I., ii., 154-155) seems to have been the first to show that the current English text cannot possibly have been made by Mandeville himself. Of the original French there is no satisfactory edition, but Dr Vogels has undertaken a critical text, and Dr Warner has added to his Egerton English text the French of a British Museum MS. with variants from three others.

It remains to mention certain other works bearing the name of Mandeville or de Bourgogne.

MS. Add. C. 280 in the Bodleian appends to the "Travels" a short French life of St Alban of *Germany*, the author of which calls himself Johan Mandivill[e], knight, formerly of the town of St Alban, and says he writes to correct an impression prevalent among his countrymen that there was no other saint of the name: this life is followed by part of a French herbal.

To Mandeville (by whom de Bourgogne is clearly meant) d'Oultremouse[13] ascribes a Latin "lappidaire selon l'oppinion des Indois," from which he quotes twelve passages, stating that the author (whom he calls knight, lord of Montfort, of Castelperouse, and of the isle of Campdi) had been "baillez en Alexandrie" seven years, and had been presented by a Saracen friend with some fine jewels which had passed into d'Oultremouse's own possession: of this *Lapidaire*, a French version, which seems to have been completed after 1479, has been several times printed.[14] A MS. of Mandeville's travels offered for sale in 1862[15] is said to have been divided into five books: (1) the travels, (2) *de là forme de la terre et comment et par quelle manière elle fut faite*, (3) *de la forme del ciel*, (4) *des herbes selon les yndois et les philosophes par de là*, and (5) *ly lapidaire*—while the cataloguer supposed Mandeville to have been the author of a concluding piece entitled *La Venianche de nostre Signeur Ihesu-Crist fayte par Vespasian fil del empereur de Romme et comment Iozeph daramathye fu deliures de la prizon*. From the treatise on herbs a passage is quoted asserting it to have been composed in 1357 in honour of the author's natural lord, Edward, king of England. This date is corroborated by the title of king of Scotland given to Edward, who had received from Baliol the surrender of the crown and kingly dignity on the 20th of January 1356, but on the 3rd of October 1357 released King David and made peace with Scotland: unfortunately we are not told whether the treatise contains the author's name, and, if so, *what* name. Tanner (*Bibliotheca*) alleges that Mandeville wrote several books on medicine, and among the Ashmolean MSS. in the Bodleian are a medical receipt by John de Magna Villa (No. 1479), an alchemical receipt by him (No. 1407), and another alchemical receipt by Johannes de Villa Magna (No. 1441).

Finally, de Bourgogne wrote under his own name a treatise on the plague,[16] extant in Latin, French and English texts, and in Latin and English abridgments. Herein he describes himself as Johannes de Burgundia, otherwise called *cum Barba*, citizen of Liége and professor of

1 The *on* in Madabron apparently represents the Arabic nunation, though its use in such a case is very odd.

2 Quoted again from him by the contemporary Liége herald, Lefort, and from Lefort in 1866 by Dr S. Bormans. Dr J. Vogels communicated it in 1884 to Mr E. W. B. Nicholson, who wrote on it in the *Academy* of April 12, 1884.

3 See Dr G. F. Warner's edition (Roxburghe Club), p. 38. In the *Bull. de l'Institut archéologique Liégeois*, iv. (1860), p. 171, M. Ferd. Henaux quotes the passage from "MSS. de la Bibliothèque publique de Liége, à l'Université, no. 360, fol. 118," but the MS. is not in the 1875 printed catalogue of the University Library, which has no Old French MS. of Mandeville at present. It was probably lent out and not returned.

4 The de Mandevilles, earls of Essex, were originally styled de Magneville, and Leland, in his *Comm. de Script. Britt.* (CDV), calls our Mandeville himself "Joannes Magnovillanus, alias Mandeville."

5 Page indications like this refer to passages in the 1866 reissue of Halliwell's edition, as being probably the most ready of access. But all these passages have also been verified as substantially occurring in Barrois's French MS. Nouv. Acq. Franç. 4515 in the Bibliothèque Nationale, Paris, mentioned below (of A.D. 1371), cited B, and in that numbered xxxix. of the Grenville collection (British Museum), which dates probably from the early part of the 15th century, cited G.

6 Viz. in D'Avezac's ed. in tom. iv. of *Rec. de voyages et de mémoires* pub. by the Soc. de Géog., 1839.

7 It is found in the *Thesaurus* of Canisius (1604), v. pt. ii. p. 95, and in the ed. of the same by Basnage (1725), iv. 337.

8 *Die Quellen für die Reisebeschreibung des Johann von Mandeville, Inaugural-Dissertation ... Leipzig* (Berlin, 1888). This was revised and enlarged as "Untersuchungen über Johann von Mandeville und die Quellen seiner Reisebeschreibung," in the *Zeitschrift der Gesellschaft für Erdkunde zu Berlin*, Bd. 23, Heft 3 u. 4 (No. 135, 136).

9 In his edition (Roxburghe Club).

10 *Die ungedruckten lateinischen Versionen Mandeville's* (Crefeld, 1886).

11 *Handschriftliche Untersuchungen über die englische Version Mandeville's* (Crefeld, 1891), p. 46.

12 Dr Vogels controverts these positions, arguing that the first English version from the French was the complete Cotton text, and that the defective English copies were made from

a defective English MS. His supposed evidences of the priority of the Cotton text equally consist with its being a later revision, and for *Roys Ils* in the defective English MSS. he has only offered a laboured and improbable explanation.

13 Stanislas Bormans, Introduction to d'Oultremouse's Chronicle, pp. lxxxix., xc.; see also Warner's edition of the Travels, p. xxxv. The ascription is on ff. 5 and 6 of *Le Tresorier de philosophie naturele des pierres precieuses*, an unprinted work by d'Oultremouse in MS. Fonds français 12326 of the Bibliothèque Nationale, Paris. The passage about Alexandria is on f. 81.

14 See L. Pannier, *Les Lapidaires français*, pp. 189-204: not knowing d'Oultremouse's evidence, he has discredited the attribution to Mandeville and doubted the existence of a Latin original.

15 *Description ... d'une collection ... d'anciens manuscrits ... réunis par les soins de M. J. Techener*, pt. i. (Paris, 1862), p. 159 (referred to by Pannier, pp. 193-194).

16 Respecting this, see David Murray, *The Black Book of Paisley*, &c. (1885), and *John de Burdeus*, &c. (1891).

MANDHATA, a village with temples in India, in Nimar district of the Central Provinces, on the south bank of the Narbada. Pop. (1901), 832. It is a famous place of Hindu pilgrimage, as containing one of the twelve great *lingas* of Siva; and as late as the beginning of the 19th century it was the scene of the self-immolation of devotees who threw themselves from the cliffs into the river.

MANDI, a native state of India, within the Punjab. It ranks as the most important of the hill states to which British influence extended in 1846 after the first Sikh War. The territory lies among the lower ranges of the Himalaya, between Kangra and Kulu. The country is mountainous, being intersected by two great parallel ranges, reaching to an average height of 5000 to 7000 ft. above sea-level. The valleys between the hill ranges are fertile, and produce all the ordinary grains, besides more valuable crops of rice, maize, sugar-cane, poppy and tobacco. Iron is found in places, and also gold in small quantities. Area, 1200 sq. m.; pop. (1901), 174,045; estimated revenue, £28,000; tribute, £6666. The chief, whose title is raja, is a Rajput of old family. Considerable sums have been expended on roads and bridges. An important product of the state is salt, which is mined in two places.

The town of Mandi is on the Beas, which is here a mountain torrent, crossed by a fine iron bridge; 2991 ft. above sea-level; 88 m. from Simla. Pop. (1901), 8144. It was founded in 1527, and contains a palace of the 17th century and other buildings of interest. It is a mart for transfrontier trade with Tibet and Yarkand.

See *Mandi State Gazetteer* (Lahore, 1908).

MANDINGO, the name currently given to a very important division of negro peoples in West Africa. It is seemingly a corruption of a term applied to an important section of this group, the Mande-nka or Mande-nga. The present writer has usually heard this word pronounced by the Mandingo themselves "Mandiña," or even "Madiña." It seems to be derived from the racial name *Mande*, coupled with the suffix *nka* or *nke*, meaning "people," the people of Mande. Then again this word Mande seems to take the varying forms of *Male*, *Meli*, *Mane*, *Madi*, and, according to such authorities as Binger, Delafosse and Desplagnes, it is connected with a word *Mali*, which means "hippopotamus" or else "manati"—probably the latter. According to Desplagnes, the word is further divisible into *ma*, which would have meant "fish," and *nde*, a syllable to which he ascribes the meaning of "father." In no Mandingo dialect known to the present writer (or in any other known African language) does the vocable *ma* apply to "fish," and in only one very doubtful far eastern Mandingo dialect is the root *nde* or any other similar sound applied to "father." This etymology must be abandoned, probably in favour of *Mani*, *Mali*, *Madi*, *Mande*, meaning "hippopotamus," and in some cases the other big water mammal, the manati.[1]

The West African tribes speaking Mandingo languages vary very much in outward appearance. Some of them may be West African negroes of the forest type with little or no intermixture with the Caucasian; others, such as the typical Mandingos or the Susus, obviously contain a non-negro element

in their physique. This last type resembles very strongly the Swahilis of the Zanzibar littoral or other crosses between the Arab and the negro; and though nearly always black-skinned, often has a well-shaped nose and a fairly full beard. The tribes dwelling in the West African forest, but speaking languages of Mandingo type, do not perhaps exhibit the very prognathous, short-limbed, "ugly" development of West African negro, but are of rather a refined type, and some of them are lighter in skin colour than the more Arab-looking Mandingos of the north. But in these forest Mandingos the beard is scanty. Occasionally the Mandingo physical type appears in eastern Liberia and on the Ivory Coast amongst people speaking Kru languages. In other cases it is associated with the Senufo speech-family.

Delafosse divides the Mandingo group linguistically into three main sections: (1) the *Mande-tamu*, (2) the *Mande-fu*, and (3) the *Mande-tã*, according as they use for the numeral 10 the root *tamu*, *tã* or *fu*. Of the first group are the important tribes of the Soni-nké (called Sarakulle by the Fula, and Sarakolé by the French); the Swaninki people of Azer, and the oases of Tishitt, Wadan and Walata in the south-west Sahara; and the Bozo, who are the fishermen along the banks of the Upper Niger and the Bani from Jenné to Timbuktu. The Soni-nké are also known as Marka, and they include (according to Binger) the Samogho and even the Kurtei along the banks of the Niger east of Timbuktu as far as Say.

The group of Mande-tã would include the Bamana (incorrectly called Bambara) of the upper Senegal and of Segu on the Upper Niger, the Toronke, the Mandenga, the Numu of the district west of the Black Volta, the Vai of south-western Liberia, and the Dyula or Gyula of the region at the back of the Ivory Coast.

The group of the Mande-fu includes a great many different languages and dialects, chiefly in the forest region of Sierra Leone and Liberia, and also

the dialects of the celebrated Susu or Soso tribe, and the Mandingo tribes of Futa Jallon, of the Grand Scarcies River and of the interior of the Ivory Coast, and of the regions between the eastern affluents of the Upper Niger and the Black Volta. To this group Delafosse joins the Boko dialect spoken by people dwelling to the west of the Lower Niger at Bussa—between Bussa and Borgu. If this hypothesis be correct it gives a curious eastern extension to the range of the Mandingo family at the present day; or it may be a vestige left by the Mandingo invasion which, according to legend, came in prehistoric times from the Hausa countries across the Niger to Senegambia. It is remarkable that this Boko dialect as recorded by the missionary Koelle most resembles certain dialects in central Liberia and in the Ivory Coast hinterland.

The Mandingos, coming from the East and riding on horses (according to tradition), seem to have invaded western Nigeria about A.D. 1000 (if not earlier), and to have gradually displaced and absorbed the Songhai or Fula (in other words, Negroid, "White") rulers of the countries in the basin of the Upper Niger or along its navigable course as far as the Bussa Rapids and the forest region. On the ruins of these Songhai, Berber, or Fula kingdoms rose the empire of Mali (Melle). Considerable sections of the Mandingo invaders had adopted Mahommedanism, and extended a great Mahommedan empire of western Nigeria far northwards into the Sahara Desert. In the 16th century the Songhai regained supreme power. See *infra*, § *The Melle Empire*.

Although the Mandingos, and especially the Susu section, may have come as conquerors, they devoted themselves through the succeeding centuries more and more to commerce. They became to the extreme west of Africa what the Hausa are in the west-central regions. Some of the Mandingo invasions, especially in the forest region, left little more than the imposition of their language; but where there was any element of Caucasian

blood (for the original Mandingo invaders were evidently dashed with the Caucasian by intermingling with some of the negroid races of north-central Africa), they imposed a degree of civilization which excluded cannibalism (still rampant in much of the forest region of West Africa), introduced working in leather and in metals, and was everywhere signalized by a passionate love of music, a characteristic of all true Mandingo tribes at the present day. It is noteworthy that many of the instruments affected by the Mandingos are found again in the more civilized regions of Bantu Africa, as well as in the central Sudan. Many of these types of musical instruments can also be traced originally to ancient Egypt. The Mandingos also seem to have brought with them in their westward march the Egyptian type of ox, with the long, erect horns. It would almost seem as if this breed had been preceded by the zebu or humped ox; though these two types are evidently of common origin so far as derivation from one wild species is concerned. The Mandingos maintain the system of totems or clans, and each section or tribe identifies itself with a symbol, which is usually an animal or a plant. The Mandenga are supposed to have either the manati or the hippopotamus as *tanna*. (Binger states that the manati was the totem of the Mande group, to which perhaps belonged originally the Susu and the Dyula.) The Bamana are the people of the crocodile; the Samanke are the people of the elephant; the Samokho of the snake. Other totems or symbols of special families or castes are the dog, the calabash or gourd, the lion, the green monkey, the leopard, the monitor lizard, a certain spice called bandugu, certain rats, the python, the puff-adder, &c.

AUTHORITIES.—The bibliography dealing with the Mandingo peoples is very extensive, but only the following works need be cited: Captain L. G. Binger, *Du Niger au Golfe de Guinée*, &c. (1892); Maurice Delafosse, *Vocabulaires comparatifs de plus de 60 langues et dialectes parlés à la Côte d'Ivoire*, &c. (1904); Lieut. Desplagnes, *Le Plateau central nigérien* (1907); Lady Lugard, *A Tropical Dependency*

(1905); Sir Harry Johnston, *Liberia* (1906). Most of these works contain extensive bibliographies. (H. H. J.)

The Melle Empire.—The tradition which ascribes the arrival of the Mandingo in the western Sudan to the 10th or 11th century is referred to in the previous section. It is not known by whom the Melle (Mali) state was founded. Neither is there certainty as to the site of the capital, also called Melle. Idrisi in the 12th century describes the Wangara (a Hausa name for the Mandingo) as a powerful people, and El Bakri writes in similar terms. But the first king whose name is preserved was Baramindana, believed to have reigned from 1213 to 1235. His territory lay south of that of Jenné, partly within the bend of the Niger and partly west of that river. The people were already Moslem, and the capital was a rendezvous for merchants from all parts of the western Sudan and the Barbary States. Mari Jatah (or Diara), Baramindana's successor, about the middle of the 13th century conquered the Susu, then masters of Ghanata (Ghana). Early in the 14th century Mansa, *i.e.* Sultan, Kunkur Musa, extended the empire, known as the Mellistine, to its greatest limits, making himself master of Timbuktu, Gao and all the Songhoi dominions. His authority extended northward over the Sahara to the Tuat oases. Mansa Suleiman was on the throne when in 1352-1353 Melle was visited by Ibn Batuta. By this monarch the empire was divided into three great provinces, ruled by viceroys. For a century afterwards Melle appears to have been the dominant Sudan state west of the Lower Niger, but it had to meet the hostility of the growing power of the pagan Mossi, of the Tuareg in the north and of the Songhoi, who under Sunni Ali (*c.* 1325) had already regained a measure of independence. Cadamosto nevertheless describes Melle in 1454 as being still the most powerful of the negro-land kingdoms and the most important for its traffic in gold and slaves. The Songhoi sovereign Askia is said to have completed the conquest of Melle at the beginning of the 16th century. It nevertheless retained some sort of national existence—though with the advent of the

Moors in the Niger countries (end of the 16th century) native civilization suffered a blow from which it never recovered. Civil war is said to have finally wrought the ruin of Melle about the middle of the 17th century.[2] The Portuguese, from their first appearance on the Senegal and Gambia, entered into friendly relations with the rulers of Melle. Barros relates (*Da Asia*, Decade I.) that John II. of Portugal sent embassies to the court of Melle by way of the Gambia (end of the 15th century). At that time the authority of Melle was said to extend westward to the coast. The king, pressed by the Mossi, the Songhoi and the Fula, solicited the help of his "friends and allies" the Portuguese—with what result does not appear; but in 1534 Barros himself despatched an ambassador to the king of Melle concerning the trade of the Gambia. By way of that river the Portuguese themselves penetrated as far as Bambuk, a country conquered by the Mandingo in the 12th century. By Barros the name of the Melle ruler is given as Mandi Mansa, which may be the native form for "Sultan of the Mandi" (Mandingo).

See further TIMBUKTU and the authorities there cited; cf. also L. Marc, *Le Pays Mossi* (Paris, 1909). Lists of Mandingo sovereigns are given in Stokvis, *Manuel d'histoire*, vol. i. (Leiden, 1888).

(F. R. C.)

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1 Indeed it is possible that the European name for this Sirenian—manati—derived from the West Indies, is the corruption of a West African word *manti*, applied very naturally to the animal by the West African slaves, who at once recognized it as similar to the creature found on the West African coast in their own rivers, and also on the Upper Niger.

2 On the ruins of the old Melle dominions arose five smaller kingdoms, representing different sections of the Mandingo peoples.

MANDLA, a town and district of British India, in the Jubbulpore division of the Central Provinces. The town is on the river Nerbudda, 1787 ft. above the sea. It has a manufacture of bell-metal vessels. Pop. (1901), 5054. The district of Mandla, among the Satpura hills, has an area of 5054 sq. m. It consists of a wild highland region, broken up by the valleys of numerous rivers and streams. The Nerbudda flows through the centre of the district, receiving several tributaries which take their rise in the Maikal hills, a range densely clothed with *sāl* forest, and forming part of the great watershed between eastern and western India. The loftiest mountain is Chauradadar, about 3400 ft. high. Tigers abound, and the proportion of deaths caused by wild animals is greater than in any other district of the Central Provinces. The magnificent *sāl* forests which formerly clothed the highlands have suffered greatly from the nomadic system of cultivation practised by the hill tribes, who burned the wood and sowed their crops in the ashes; but measures have been taken to prevent further damage. The population in 1901 was 318,400, showing a decrease of 6.5% in the decade, due to famine. The aboriginal or hill tribes are more numerous in Mandla than in any other district of the Central Provinces, particularly the Gonds. The principal crops are rice, wheat, other food grains, pulse and oilseeds. There is a little manufacture of country cloth. A branch of the Bengal-Nagpur railway touches the south-western border of the district. Mandla suffered most severely from the famine of 1896-1897, partly owing to its

inaccessibility, and partly from the shy habits of the aboriginal tribes. The registered death-rate in 1907 was as high as 96 per thousand.

MANDOLINE (Fr. *mandoline*; Ger. *Mandoline*; It. *mandolina*), the treble member of the lute family, and therefore a stringed instrument of great antiquity. The mandoline is classified amongst the stringed instruments having a vaulted back, which is more accentuated than even that of the lute. The mandoline is strung with steel and brass wire strings. There are two varieties of mandolines, both Italian: (1) the *Neapolitan*, 2 ft. long, which is the best known, and has four courses of pairs of unisons tuned like the violin in fifths; (2) the *Milanese*, which is slightly larger and has five or six courses of pairs of unisons. The neck is covered by a finger-board, on which are distributed the twelve or more frets which form nuts at the correct points under the strings on which the fingers must press to obtain the chromatic semitones of the scale. The strings are twanged by means of a plectrum or pick, held between the thumb and first finger of the right hand. In order to strike a string the pick is given a gliding motion over the string combined with a *down* or an *up* movement, respectively indicated by signs over the notes. In order to sustain notes on the mandoline the effect known as *tremolo* is employed; it is produced by means of a double movement of the pick up and down over a pair of strings.

The mandoline is a derivative of the mandola or mandore, which was smaller than the lute but larger than either of the mandolines

described above. It had from four to eight courses of strings, the *chanterelle* or melody string being single and the others in pairs of unisons. The mandore is mentioned in Robert de Calenson (12th cent.), and elsewhere; it may be identified with the pandura.

The Neapolitan mandoline was scored for by Mozart as an accompaniment to the celebrated serenade in *Don Juan*. Beethoven wrote for it a *Sonatina per il mandolino*, dedicated to his friend Krumpholz. Grétry and Paisiello also introduced it into their operas as an accompaniment to serenades.

The earliest method for the mandoline was published by Fouchette in Paris in 1770. The earliest mention of the instrument in England, in 1707, is quoted in Ashton's *Social Life in the Reign of Queen Anne*: "Signior Conti will play ... on the mandoline, an instrument not known yet."

(K. S.)

MANDRAKE (*Mandragora officinarum*), a plant of the potato family, order Solanaceae, a native of the Mediterranean region. It has a short stem bearing a tuft of ovate leaves, with a thick fleshy and often forked root. The flowers are solitary, with a purple bell-shaped corolla; the fruit is a fleshy orange-coloured berry. The mandrake has been long known for its poisonous properties and supposed virtues. It acts as an emetic, purgative and narcotic, and was much esteemed in old times; but, except in Africa and the East, where it is used as a narcotic and anti-spasmodic, it has

fallen into well-earned disrepute. In ancient times, according to Isidorus and Serapion, it was used as a narcotic to diminish sensibility under surgical operations, and the same use is mentioned by Kazwīnī, i. 297, *s.v.* "Luffāḥ" Shakespeare more than once alludes to this plant, as in *Antony and Cleopatra*: "Give me to drink mandragora." The notion that the plant shrieked when touched is alluded to in *Romeo and Juliet*: "And shrieks like mandrakes torn out of the earth, that living mortals, hearing them, run mad." The mandrake, often growing like the lower limbs of a man, was supposed to have other virtues, and was much used for love philtres, while the fruit was supposed, and in the East is still supposed, to facilitate pregnancy (Aug., *C. Faust*. xxii. 56; cf. Gen. xxx. 14, where the Hebrew דדראמ is undoubtedly the mandrake). Like the mallow, the mandrake was potent in all kinds of enchantment (see Maimonides in Chwolson, *Ssabier*, ii. 459). Dioscorides identifies it with the κιρκαία, the root named after the enchantress Circe. To it appears to apply the fable of the magical herb Baaras, which cured demoniacs, and was procured at great risk or by the death of a dog employed to drag it up, in Josephus (*B. J.* vii. 6, § 3). The German name of the plant (*Alraune*; O. H. G. *Alrûna*) indicates the prophetic power supposed to be in little images (homunculi, Goldmännchen, Galgenmännchen) made of this root which were cherished as oracles. The possession of such roots was thought to ensure prosperity. (See Du Cange, *s.vv.* "Mandragora" and Littré.)

Gerard in 1597 (*Herball*, p. 280) described male and female mandrakes, and Dioscorides also recognizes two such plants corresponding to the spring and autumn species (*M. vernalis* and *M. officinarum* respectively), differing in the colour of the foliage and shape of fruit.

MANDRILL (a name formed by the prefix “man” to the word “drill,” which was used in ancient literature to denote an ape, and is probably of West African origin), the common title of the most hideous and most brilliantly coloured of all the African monkeys collectively denominated baboons and constituting the genus *Papio*. Together with the *drill* (*q.v.*), the mandrill, *Papio maimon*, constitutes the subgenus *Maimon*, which is exclusively West African in distribution, and characterized, among other peculiarities, by the extreme shortness of the tail, and the great development of the longitudinal bony swellings, covered during life with naked skin, on the sides of the muzzle. As a whole, the mandrill is characterized by heaviness of body, stoutness and strength of limb, and exceeding shortness of tail, which is a mere stump, not 2 in. long, and usually carried erect. It is, moreover, remarkable for the prominence of its brow-ridges, beneath which the small and closely approximated eyes are deeply sunk; the immense size of the canine teeth; and more especially for the extraordinarily vivid colouring of some parts of the skin. The body generally is covered with soft hair—light olive-brown above and silvery grey beneath—and the chin is furnished underneath with a small pointed yellow beard. The hair of the forehead and temples is directed upwards so as to meet in a point on the crown, which gives the head a triangular appearance. The ears are naked, and bluish black. The hands and feet are naked, and black. A large space around the greatly developed callosities on the buttocks, as well as the upper part of the insides of the thighs, is naked

and of a crimson colour, shading off on the sides to lilac or blue, which, depending upon injection of the superficial blood-vessels, varies in intensity according to the condition of the animal—increasing under excitement, fading during sickness, and disappearing after death. It is, however, in the face that the most remarkable disposition of vivid hues occurs, more resembling those of a brilliantly coloured flower than what might be expected in a mammal. The cheek-prominences are of an intense blue, the effect of which is heightened by deeply sunk longitudinal furrows of a darker tint, while the central line and termination of the nose are bright scarlet. It is only to fully adult males that this description applies. The female is of much smaller size, and more slender; and, though the general tone of the hairy parts of the body is the same, the prominences, furrows, and colouring of the face are much less marked. The young males have black faces.

Old males are remarkable for the ferocity of their disposition, as well as for other disagreeable qualities; but when young they can easily be tamed. Like baboons, mandrills appear to be indiscriminate eaters, feeding on fruit, roots, reptiles, insects, scorpions, &c., and inhabit open rocky ground rather than forests. Not much is known of the mandrill's habits in the wild state, nor of the exact limits of its geographical distribution; the specimens brought to Europe coming from the west coast of tropical Africa, from Guinea to the Gaboon. (See also PRIMATES.)

(W. H. F.; R. L.*)

MANDU, or MANDOGARH, a ruined city in the Dhar state of Central India, the ancient capital of the Mahommedan kingdom of Malwa. The city is situated at an elevation of 2079 ft. and extends for 8 m. along the crest of the Vindhyan mountains. It reached its greatest splendour in the 15th century under Hoshang Shah (1405-1434). The circuit of the battlemented wall is nearly 23 m., enclosing a large number of palaces, mosques and other buildings. The oldest mosque dates from 1405; the finest is the Jama Masjid or great mosque, a notable example of Pathan architecture, founded by Hoshang Shah. The marble-domed tomb of this ruler is also magnificent.

For a description and history of Mandu, see Sir James Campbell's *Gazetteer of Bombay*, vol. i. part ii. (1896), and *Journal of the Bombay Asiatic Society* (vol. xxi.).

MANDURIA, a city of Apulia, Italy, in the province of Lecce, from which it is 27 m. W. by road (22 m. E. of Taranto), 270 ft. above sea-level, and 8 m. N. of the coast. Pop. (1901), 12,199 (town); 13,190 (commune). It is close to the site of the ancient Manduria, considerable remains of the defences of which can still be seen; they consisted of a double line of wall built of rectangular blocks of stone, without mortar, and with a broad ditch in front. Some tombs with gold ornaments were found in 1886 (L. Viola in *Notizie degli Scavi*, 1886, 100). It was an important stronghold of the Messapii against Tarentum, and Archidamus III., king of Sparta, fell beneath its walls in 338 B.C., while leading the army of the latter (Plut.,

Agis, 3, calls the place Mandonion: see s.v. ARCHIDAMUS). It revolted to Hannibal, but was stormed by the Romans in 209 B.C. Pliny mentions a spring here which never changed its level, and may still be seen. The town was destroyed by the Saracens in the 10th century; the inhabitants settled themselves on the site of the present town, at first called Casalnuovo, which resumed the old name in 1700.

(T. As.)

MANDVI, a seaport of India, in the native state of Cutch, within the Gujarat province of Bombay, 36 m. from Bhuj, and 182 m. by sea from Karachi. Pop. (1901), 24,683. It is a weekly port of call for steamers of the British India line, vessels of 70 tons cannot come nearer than 500 yards. The pilots and sailors of Mandvi have a high reputation.

MANES, in Roman mythology, the disembodied and immortal spirits of the dead. The word is an old adjective—*manis*, *manus*, meaning "good," the opposite of which is *immanis*; hence the Manes, clearly a euphemistic term, are the "good people." They were looked upon as gods; hence the

dedication, of great antiquity and frequent occurrence, *Divis* or *Dis Manibus* in sepulchral inscriptions, used even in Christian times. When a body was consumed on the funeral pyre, relations and friends invoked the deceased as a divinity, and the law of the Twelve Tables prescribed that the rights of the divine Manes should be respected, and that each man should regard the dead members of his family as gods. Their home was in the bowels of the earth, from which they only emerged at certain times. It was an old Italian custom—especially at the foundation of cities—to dig a pit in the form of an inverted sky (hence called *mundus*), the lower part of which was supposed to be sacred to the gods of the underworld, including the Manes. Such a pit existed on the Palatine at Rome. It was covered by a stone called *lapis manalis*, representing the entrance to the lower world, which was removed three times in the year (Aug. 24, Oct. 5, Nov. 8). The Manes were then believed to issue forth, and these days were regarded as *religiosi*—that is, all important business in public and private life was suspended. Offerings were made to propitiate the dead: libations of water, wine, warm milk, honey, oil, and the blood of sacrificial victims—black sheep, pigs and oxen (*suovetaurilia*)—was poured upon the graves; ointment and incense were offered, lamps were lighted, and the grave was adorned with garlands of flowers, especially roses and violets. Beans, eggs, lentils, salt, bread and wine, placed on the grave, formed the chief part of a meal partaken of by the mourners. There was also a public state festival in honour of the dead, called Parentalia, held from the 13th to the 21st of February, the last month of the old Roman year, the last day of the festival being called Feralia. During its continuance all the temples were shut, marriages were forbidden, and the magistrates had to appear without the insignia of their office.

There was considerable analogy between the Manes and the received idea of “souls”—and there was a corresponding idea that they could be conjured up and appear as ghosts. They were also supposed to have the

power of sending dreams. It is to be noticed that, unlike the Lares, the Manes are never spoken of singly.

For authorities, see LARES and PENATES.

MANET, ÉDOUARD (1832-1883), French painter, regarded as the most important master of Impressionism (*q.v.*), was born in Paris on the 23rd of January 1832. After spending some time under the tuition of the Abbé Poiloup, he entered the Collège Rollin, where his passion for drawing led him to neglect all his other lessons. His studies finished in 1848, he was placed on board the ship *Guadeloupe*, voyaging to Rio de Janeiro. On his return he first studied in Couture's studio (1851), where his independence often infuriated his master. For six years he was an intermittent visitor to the studio, constantly taking leave to travel, and going first to Cassel, Dresden, Vienna and Munich, and afterwards to Florence, Rome and Venice, where he made some stay. Some important drawings date from this period, and one picture, "A Nymph Surprised." Then, after imitating Couture, more or less, in "The Absinthe-drinker" (1866), and Courbet in "The Old Musician," he devoted himself almost exclusively to the study of the Spanish masters in the Louvre. A group was already gathering round him—Whistler, Legros, and Fantin-Latour haunted his studio in the Rue Guyot. His "Spaniard playing the Guitar," in the Salon of 1861, excited much animadversion. Delacroix alone defended Manet, but, this notwithstanding, his "Fifer of the Guard" and "Breakfast on the Grass"

were refused by the jury. Then the “Exhibition of the Rejected” was opened, and round Manet a group was formed, including Bracquemond, Legros, Jongkind, Whistler, Harpignies and Fantin-Latour, the writers Zola, Duranty and Duret, and Astruc the sculptor. In 1863, when an amateur, M. Martinet, lent an exhibition-room to Manet, the painter exhibited fourteen pictures; and then, in 1864, contributed again to the Salon “The Angels at the Tomb” and “A Bullfight.” Of this picture he afterwards kept nothing but the toreador in the foreground, and it is now known as “The Dead Man.” In 1865 he sent to the Salon “Christ reviled by the Soldiers” and the famous “Olympia,” which was hailed with mockery and laughter. It represents a nude woman reclining on a couch, behind which is seen the head of a negress who carries a bunch of flowers. A black cat at her feet emphasizes the whiteness of the sheet on which the woman lies. This work (now in the Louvre) was presented to the Luxembourg by a subscription started by Claude Monet (1890). It was hung in 1897 among the Caillebotte collection, which included the “Balcony,” and a study of a female head called “Angelina.” This production, of a highly independent individuality, secured Manet’s exclusion from the Salon of 1866, so that he determined to exhibit his pictures in a place apart during the Great Exhibition of 1867. In a large gallery in the Avenue de l’Alma, half of which was occupied by Courbet, he hung no fewer than fifty paintings. Only one important picture was absent, “The Execution of the Emperor Maximilian”; its exhibition was prohibited by the authorities. From that time, in spite of the fierce hostility of some adversaries, Manet’s energy and that of his supporters began to gain the day. His “Young Girl” (Salon of 1868) was justly appreciated, as well as the portrait of Lola; but the “Balcony” and the “Breakfast” (1869) were as severely handled as the “Olympia” had been. In 1870 he exhibited “The Music Lesson” and a portrait of Mlle E. Gonzales. Not long before the Franco-Prussian War, Manet, finding himself in the country with a friend, for the first time discovered the true value of open air to the effects of

painting in his picture “The Garden,” which gave rise to the “open air” or *plein air* school. After fighting as a gunner, he returned to his family in the Pyrenees, where he painted “The Battle of the *Kearsarge* and the *Alabama*.” His “Bon Bock” (1873) created a *furore*. But in 1875, as in 1869, there was a fresh outburst of abuse, this time of the “Railroad,” “Polichinelle,” and “Argenteuil,” and the jury excluded the artist, who for the second time arranged an exhibition in his studio. In 1877 his “Hamlet” was admitted to the Salon, but “Nana” was rejected. The following works were exhibited at the Salon of 1881: “In the Conservatory,” “In a Boat,” and the portraits of Rochefort and Proust; and the Cross of the Legion of Honour was conferred on the painter on the 31st of December in that year. Manet died in Paris on the 20th of April 1883. He left, besides his pictures, a number of pastels and engravings. He illustrated *Les Chats* by Champfleury, and Edgar Allan Poe’s *The Raven*.

See Zola, *Manet* (Paris, 1867); E. Bazire, *Manet* (Paris, 1884); G. Geffroy, *La Vie artistique* (1893).

(H. Fr.)

MANETENERIS, a tribe of South American Indians of the upper Purus river, and between it and the Jurua, north-western Brazil. They manufacture cotton cloth, and have iron axes and fish hooks. The men wear long ponchos, the women sacks open at the bottom. The Maneteneris are essentially a waterside people. Their cedarwood canoes are very long and beautifully made.

MANETHO (Μανέθων in an inscription of Carthage; Μανεθὼς in a papyrus), Egyptian priest and annalist, was a native of Sebennytus in the Delta. The name which he bears has a good Egyptian appearance, and has been found on a contemporary papyrus probably referring to the man himself. The evidence of Plutarch and other indications connect him with the reigns of Ptolemy I. and II. His most important work was an Egyptian history in Greek, for which he translated the native records. It is now only known by some fragments of narrative in Josephus's treatise *Against Apion*, and by tables of dynasties and kings with lengths of reigns, divided into three books, in the works of Christian chronographers. The earliest and best of the latter is Julius Africanus, besides whom Eusebius and some falsifying apologists offer the same materials; the chief text is that preserved in the *Chronographia* of Georgius Syncellus. It is difficult to judge the value of the original from these extracts: it is clear from the different versions of the lists that they have been corrupted. Manetho's work was probably based on native lists like that of the Turin Papyrus of Kings: even his division into dynasties may have been derived from such. The fragments of narrative give a very confused idea of Egyptian history in the time of the Hyksos and the XVIIIth Dynasty. The royal lists, too, are crowded with errors of detail, both in the names and order of the kings, and in the lengths attributed to the reigns. The brief notes attached to some of the names may be derived from Manetho's narrative, but they are chiefly references to kings mentioned by Herodotus or to marvels that were supposed to have occurred: they certainly

possess little historical value. A puzzling annotation to the name of Bocchoris, "in whose time a lamb spake 990 years," has been well explained by Krall's reading of a demotic story written in the twenty-third year of Augustus. According to this a lamb prophesied that after Bocchoris's reign Egypt should be in the hands of the oppressor 900 years; in Africanus's day it was necessary to lengthen the period in order to keep up the spirits of the patriots after the stated term had expired. This is evidently not from the pure text of Manetho. Notwithstanding all their defects, the fragments of Manetho have provided the accepted scheme of Egyptian dynasties and have been of great service to scholars ever since the first months of Champollion's decipherment.

See C. Müller, *Fragmenta historicorum graecorum*, ii. 511-616; A. Wiedemann, *Aegyptische Geschichte* (Gotha, 1884), pp. 121 et sqq.; J. Krall in *Festgaben für Büdinger* (Innsbruck, 1898); Grenfell and Hunt, *El Hibeh Papyri*, i. 223; also the section on chronology in EGYPT, and generally books on Egyptian history and chronology.

(F. LL. G.)

MANFRED (*c.* 1232-1266), king of Sicily, was a natural son of the emperor Frederick II. by Bianca Lancia, or Lanzia, who is reported on somewhat slender evidence to have been married to the emperor just before his death. Frederick himself appears to have regarded Manfred as legitimate, and by his will named him as prince of Tarentum and appointed him as the representative in Italy of his half-brother, the German king,

Conrad IV. Although only about eighteen years of age Manfred acted loyally and with vigour in the execution of his trust, and when Conrad appeared in southern Italy in 1252 his authority was quickly and generally acknowledged. When in May 1254 the German king died, Manfred, after refusing to surrender Sicily to Pope Innocent IV., accepted the regency on behalf of Conradin, the infant son of Conrad. But the strength of the papal party in the Sicilian kingdom rendered the position of the regent so precarious that he decided to open negotiations with Innocent. By a treaty made in September 1254, Apulia passed under the authority of the pope, who was personally conducted by Manfred into his new possession. But Manfred's suspicions being aroused by the demeanour of the papal retinue, he fled to the Saracens at Lucera. Aided by Saracen allies, he defeated the papal troops at Foggia on the 2nd of December 1254, and soon established his authority over Sicily and the Sicilian possessions on the mainland.

Taking advantage in 1258 of a rumour that Conradin was dead, Manfred was crowned king of Sicily at Palermo on the 10th of August in that year. The falsehood of this report was soon manifest; but the new king, supported by the popular voice, declined to abdicate, and pointed out to Conradin's envoys the necessity for a strong native ruler. But the pope, to whom the Saracen alliance was a serious offence, declared Manfred's coronation void and pronounced sentence of excommunication. Undeterred by this sentence Manfred sought to obtain power in central and northern Italy, and in conjunction with the Ghibellines his forces defeated the Guelphs at Monte Aperto on the 4th of September 1260. He was then recognized as protector of Tuscany by the citizens of Florence, who did homage to his representative, and he was chosen senator of the Romans by a faction in the city. Terrified by these proceedings, Pope Urban IV. implored aid from France, and persuaded Charles count of Anjou, a brother of King Louis IX., to accept the investiture of the kingdom of Sicily at his hands. Hearing of the approach of Charles, Manfred issued a manifesto to the Romans, in

which he not only defended his rule over Italy but even claimed the imperial crown. The rival armies met near Benevento on the 26th of February 1266, where, although the Germans fought with undaunted courage, the cowardice of the Italians quickly brought destruction on Manfred's army. The king himself, refusing to fly, rushed into the midst of his enemies and was killed. Over his body, which was buried on the battlefield, a huge heap of stones was placed, but afterwards with the consent of the pope the remains were unearthed, cast out of the papal territory, and interred on the banks of the Liris. Manfred was twice married. His first wife was Beatrice, daughter of Amadeus IV. count of Savoy, by whom he had a daughter, Constance, who became the wife of Peter III. king of Aragon; and his second wife, who died in prison in 1271, was Helena, daughter of Michael II. despot of Epirus. Contemporaries praise the noble and magnanimous character of Manfred, who was renowned for his physical beauty and intellectual attainments.

Manfred forms the subject of dramas by E. B. S. Raupach, O. Marbach and F. W. Roggee. Three letters written by Manfred are published by J. B. Carusius in *Bibliotheca historica regni Siciliae* (Palermo, 1732). See Cesare, *Storia di Manfredi* (Naples, 1837); Münch, *König Manfred* (Stuttgart, 1840); Riccio, *Alcuni studii storici intorno a Manfredi e Conradino* (Naples, 1850); F. W. Schirrmacher, *Die letzten Hohenstaufen* (Göttingen, 1871); Capesso, *Historia diplomatica regni Siciliae* (Naples, 1874); A. Karst, *Geschichte Manfreds vom Tode Friedrichs II. bis zu seiner Krönung* (Berlin, 1897); and K. Hampe, *Urban IV. und Manfred* (Heidelberg, 1905).

MANFREDONIA, a town and archiepiscopal see (with Viesti) of Apulia, Italy, in the province of Foggia, from which it is 22½ m. N.E. by rail, situated on the coast, facing E., 13 ft. above sea-level, to the south of Monte Gargano, and giving its name to the gulf to the east of it. Pop. (1901), 11,549. It was founded by Manfred in 1263, and destroyed by the Turks in 1620; but the medieval castle of the Angevins and parts of the town walls are well preserved. In the church of S. Domenico, the chapel of the Maddalena contains old paintings of the 14th century. Two miles to the south-west is the fine cathedral of S. Maria Maggiore di Siponto, built in 1117 in the Romanesque style, with a dome and crypt. S. Leonardo, nearer Foggia, belonging to the Teutonic order, is of the same date. This marks the site of the ancient Sipontum, the harbour of Arpi, which became a Roman colony in 194 B.C., and was not deserted in favour of Manfredonia until the 13th century, having become unhealthy owing to the stagnation of the water in the lagoons.

See A. Beltramelli, *Il Gargano* (Bergamo, 1907).

(T. As.)

MANGABEY, a name (probably of French origin) applied to the West African monkeys of the genus *Cercocebus*, the more typical representatives of which are characterized by their bare, flesh-coloured upper eye-lids, and the uniformly coloured hairs of the fur. (See PRIMATES.)

MANGALIA, a town in the department of Constantza Rumania, situated on the Black Sea, and at the mouth of a small stream, the Mangalia, 10 m. N. of the Bulgarian frontier. Pop. (1900), 1459. The inhabitants, among whom are many Turks and Bulgarians, are mostly fisherfolk. Mangalia is to be identified with the Thracian Kallatis or Acervetis, a colony of Miletus which continued to be a flourishing place to the close of the Roman period. In the 14th century it had 30,000 inhabitants, and a large trade with Genoa.

MANGALORE, a seaport of British India, administrative headquarters of the South Kanara district of Madras, and terminus of the west coast line of the Madras railway. Pop. (1901), 44,108. The harbour is

formed by the backwater of two small rivers. Vessels ride in 24 to 30 ft. of water, and load from and unload into lighters. The chief exports are coffee, coco-nut products, timber, rice and spices. Mangalore clears and exports all the coffee of Coorg, and trades directly with Arabia and the Persian Gulf. There is a small shipbuilding industry. The town has a large Roman Catholic population, with a European bishop, several churches, a convent and a college. It is the headquarters of the Basel Lutheran mission, which possesses one of the most active printing presses in southern India, and has also successfully introduced the industries of weaving and the manufacture of tiles. Two colleges (Government and St Aloysius) are situated here. Mangalore was gallantly defended by Colonel John Campbell of the 42nd regiment from May 6, 1783, to January 30, 1784, with a garrison of 1850 men, of whom 412 were English, against Tippoo Sultan's whole army.

MANGAN, JAMES CLARENCE (1803-1849), Irish poet, was born in Dublin on the 1st of May 1803. His baptismal name was James, the "Clarence" being his own addition. His father, a grocer, who boasted of the terror with which he inspired his children, had ruined himself by imprudent speculation and extravagant hospitality. The burden of supporting the family fell on James, who entered a scrivener's office, at the age of fifteen, and drudged as a copying clerk for ten years. He was employed for some time in the library of Trinity College, and in 1833 he found a place in the Irish Ordnance Survey. He suffered a disappointment in love, and continued ill health drove him to the use of opium. He was

habitually the victim of hallucinations which at times threatened his reason. For Charles Maturin, the eccentric author of *Melmoth*, he cherished a deep admiration, the results of which are evident in his prose stories. He belonged to the Comet Club, a group of youthful enthusiasts who carried on war in their paper, the *Comet*, against the levying of tithes on behalf of the Protestant clergy. Contributions to the *Dublin Penny Journal* followed; and to the *Dublin University Magazine* he sent translations from the German poets. The mystical tendency of German poetry had a special appeal for him. He chose poems that were attuned to his own melancholy temperament, and did much that was excellent in this field. He also wrote versions of old Irish poems, though his knowledge of the language, at any rate at the beginning of his career, was but slight. Some of his best-known Irish poems, however, *O'Hussey's Ode to the Maguire*, for instance, follow the originals very closely. Besides these were "translations" from Arabic, Turkish and Persian. How much of these languages he knew is uncertain, but he had read widely in Oriental subjects, and some of the poems are exquisite though the original authors whom he cites are frequently mythical. He took a mischievous pleasure in mystifying his readers, and in practising extraordinary metres. For the *Nation* he wrote from the beginning (1842) of its career, and much of his best work appeared in it. He afterwards contributed to the *United Irishman*. On the 20th of June 1849 he died at Meath Hospital, Dublin, of cholera. It was alleged at the time that starvation was the real cause. This statement was untrue, but there is no doubt that his wretched poverty made him ill able to withstand disease.

Mangan holds a high place among Irish poets, but his fame was deferred by the inequality and mass of his work, much of which lay buried in inaccessible newspaper files under his many pseudonyms, "Vacuus," "Terrae Filius," "Clarence," &c. Of his genius, morbid though it sometimes is, as in his tragic autobiographical ballad of *The Nameless One*, there can be no question. He expressed with rare sincerity the tragedy of Irish hopes

and aspirations, and he furnished abundant proof of his versatility in his excellent nonsense verses, which are in strange contrast with the general trend of his work.

An autobiography which appeared in the *Irish Monthly* (1882) does not reproduce the real facts of his career with any fidelity. For some time after his death there was no adequate edition of his works, but *German Anthology* (1845), and *The Poets and Poetry of Munster* (1849) had appeared during his lifetime. In 1850 Hercules Ellis included thirty of his ballads in his *Romances and Ballads of Ireland*. Other selections appeared subsequently, notably one (1897), by Miss L. I. Guiney. *The Poems of James Clarence Mangan* (1903), and the *Prose Writings* (1904), were both edited by D. J. O'Donoghue, who wrote in 1897 a complete account of the *Life and Writings* of the poet.

MANGANESE [symbol Mn; atomic weight, 54.93 (O = 16)], a metallic chemical element. Its dioxide (pyrolusite) has been known from very early times, and was at first mistaken for a magnetic oxide of iron. In 1740 J. H. Pott showed that it did not contain iron and that it yielded a definite series of salts, whilst in 1774 C. Scheele proved that it was the oxide of a distinctive metal. Manganese is found widely distributed in nature, being generally found to a greater or less extent associated with the carbonates and silicates of iron, calcium and magnesium, and also as the minerals braunite, hausmannite, psilomelane, manganite, manganese spar

and hauerite. It has also been recognized in the atmosphere of the sun (A. Cornu, *Comptes rendus*, 1878, 86, pp. 315, 530), in sea water, and in many mineral waters.

The metal was isolated by J. G. Gahn in 1774, and in 1807 J. F. John (*Gehlen's Jour. chem. phys.*, 1807, 3, p. 452) obtained an impure metal by reducing the carbonate at a high temperature with charcoal, mixed with a small quantity of oil. R. Bunsen prepared the metal by electrolysing manganese chloride in a porous cell surrounded by a carbon crucible containing hydrochloric acid. Various reduction methods have been employed for the isolation of the metal. C. Brunner (*Pogg. Ann.*, 1857, 101, p. 264) reduced the fluoride by metallic sodium, and E. Glatzel (*Ber.*, 1889, 22, p. 2857) the chloride by magnesium, H. Moissan (*Ann. Chim. Phys.*, 1896 (7) 9, p. 286) reduced the oxide with carbon in the electric furnace; and H. Goldschmidt has prepared the metal from the oxide by means of his "thermite" process (see CHROMIUM). W. H. Green and W. H. Wahl [German patent 70773 (1893)] prepare a 97% manganese from pyrolusite by heating it with 30% sulphuric acid, the product being then converted into manganous oxide by heating in a current of reducing gas at a dull red heat, cooled in a reducing atmosphere, and finally reduced by heating with granulated aluminium in a magnesia crucible with lime and fluorspar as a flux. A purer metal is obtained by reducing manganese amalgam by hydrogen (O. Prelinger, *Monats.*, 1894, 14, p. 353).

Prelinger's manganese has a specific gravity of 7.42, and the variety obtained by distilling pure manganese amalgam *in vacuo* is pyrophoric (A. Guntz, *Bull. Soc.* [3], 7, 275), and burns when heated in a current of sulphur dioxide. The pure metal readily evolves hydrogen when acted upon by sulphuric and hydrochloric acids, and is readily attacked by dilute nitric acid. It precipitates many metals from solutions of their salts. It is employed commercially in the manufacture of special steels. (See IRON AND STEEL.)

Compounds

Manganese forms several oxides, the most important of which are manganous oxide, MnO, trimanganese tetroxide, Mn_3O_4, manganese sesquioxide, Mn_2O_3, manganese dioxide, MnO_2, manganese trioxide, MnO_3, and manganese heptoxide, Mn_3O_7.

Manganous oxide, MnO, is obtained by heating a mixture of anhydrous manganese chloride and sodium carbonate with a small quantity of ammonium chloride (J. v. Liebig and F. Wöhler, *Pogg. Ann.*, 1830, 21, p. 584); or by reducing the higher oxides with hydrogen or carbon monoxide. It is a dark coloured powder of specific gravity 5.09. *Manganous hydroxide*, $Mn(OH)_2$, is obtained as a white precipitate on adding a solution of a caustic alkali to a manganous salt. For the preparation of the crystalline variety identical with the mineral pyrochroite (see A. de Schulten, *Comptes rendus*, 1887, 105, p. 1265). It rapidly oxidizes on exposure to air and turns brown, going ultimately to the sesquioxide. *Trimanganese tetroxide*, Mn_3O_4, is produced more or less pure when the other oxides are heated. It may be obtained crystalline by heating manganese sulphate and potassium sulphate to a bright red heat (H. Debray, *Comptes rendus*, 1861, 52, p. 985). It is a reddish-brown powder, which when heated with hydrochloric acid yields chlorine. *Manganese sesquioxide*, Mn_2O_3, found native as the mineral braunite, may be obtained by igniting the other oxides in a mixture of nitrogen and oxygen, containing not more than 26% of the latter gas (W. Dittmar, *Jour. Chem. Soc.*, 1864, 17, p. 294). The hydrated form, found native as the mineral manganite, is produced by the spontaneous oxidation of manganous hydroxide. In the hydrated condition it is a dark brown powder which readily loses water at above 100° C., it dissolves in hot nitric acid, giving manganous nitrate and

manganese dioxide: $2MnO(OH) + 2HNO_3 = Mn(NO_3)_2 + MnO_2 + 2H_2O$. *Manganese dioxide*, or pyrolusite (*q.v.*), MnO_2, the most important oxide, may be prepared by heating crystallized manganous nitrate until red fumes are given off, decanting the clear liquid, and heating to 150° to 160° C. for 40 to 60 hours (A. Gorgen, *Bull. Soc.*, 1890 [3], 4, p. 16), or by heating manganese carbonate to 260° C. in the presence of air and washing the residue with very dilute cold hydrochloric acid. It is a hard black solid which readily loses oxygen when strongly heated, leaving a residue of Mn_3O_4. When heated with concentrated hydrochloric acid it yields chlorine, and with concentrated sulphuric acid it yields oxygen. It is reduced to the monoxide when heated in a current of hydrogen. It is a strong oxidizing agent. It dissolves in cold concentrated hydrochloric acid, forming a dark brown solution which probably contains manganic chloride (see R. J. Meyer, *Zeit. anorg. Chem.*, 1899, 22, p. 169; G. Neumann, *Monats.*, 1894, 15, p. 489). It is almost impossible to prepare a pure hydrated manganese dioxide owing to the readiness with which it loses oxygen, leaving residues of the type $xMnO \cdot yMnO_2$. Such mixtures are obtained by the action of alkaline hypochlorites on manganous salts, or by suspending manganous carbonate in water and passing chlorine through the mixture. The solid matter is filtered off, washed with water, and warmed with 10% nitric acid (A. Gorgen). It is a dark brown powder, which reddens litmus. Manganese dioxide combines with other basic oxides to form *manganites*, and on this property is based the Weldon process for the recovery of manganese from the waste liquors of the chlorine stills (see CHLORINE). The manganites are amorphous brown solids, insoluble in water, and decomposed by hydrochloric acid with the evolution of chlorine. *Manganese trioxide*, MnO_3, is obtained in small quantity as an unstable deliquescent red solid by dropping a solution of potassium permanganate in sulphuric acid on to dry sodium

carbonate (B. Franke, *Jour. prak. Chem.*, 1887 [2], 36, p. 31). Above 50° C. it decomposes into the dioxide and oxygen. It dissolves in water forming manganic acid, H_2MnO_4. *Manganese heptoxide*, Mn_2O_7, prepared by adding pure potassium permanganate to well cooled, concentrated sulphuric acid, when the oxide separates as a dark oil (H. Aschoff, *Pogg. Ann.*, 1860, 111, p. 217), is very unstable, continually giving off oxygen. It decomposes violently on heating, and explodes in contact with hydrogen, sulphur, phosphorus, &c. It dissolves in water to form a deep red solution which contains *permanganic acid*, $HMnO_4$. This acid is also formed by decomposing barium or lead permanganate with dilute sulphuric acid. It is only known in aqueous solution. This solution is of a deep violet-red colour, and is somewhat fluorescent; it decomposes on exposure to light, or when heated. It is a monobasic acid, and a very powerful oxidizing agent (M. M. P. Muir, *Jour. Chem. Soc.*, 1907, 91, p. 1485).

Manganous Salts.—The anhydrous *chloride*, $MnCl_2$, is obtained as a rose-red crystalline solid by passing hydrochloric acid gas over manganese carbonate, first in the cold and afterwards at a moderate red heat. The hydrated chloride, $MnCl_2 \cdot 4H_2O$, is obtained in rose-red crystals by dissolving the metal or its carbonate in aqueous hydrochloric acid and concentrating the solution. It may be obtained in at least two different forms, one isomorphous with $NaCl \cdot 2H_2O$, by concentrating the solution between 15° C. and 20°C.; the other, isomorphous with $FeCl_2 \cdot 4H_2O$, by slow evaporation of the mother liquors from the former. It forms double salts with the chlorides of the alkali metals. The *bromide* $MnBr_2 \cdot 4H_2O$, *iodide*, MnI_2, and *fluoride*, MnF_2, are known.

Manganous Sulphate, $MnSO_4$, is prepared by strongly heating a paste of pyrolusite and concentrated sulphuric acid until acid fumes

cease to be evolved. The ferric and aluminium sulphates present are thus converted into insoluble basic salts, and the residue yields manganous sulphate when extracted with water. The salt crystallizes with varying quantities of water, according to the temperature at which crystallization is effected: between −4° C. and +6° C. with $7H_2O$, between 15° C. and 20° C. with $5H_2O$, and between 25° C. and 31° C. with $4H_2O$. It crystallizes in large pink crystals, the colour of which is probably due to the presence of a small quantity of manganic sulphate or of a cobalt sulphate. It combines with the sulphates of the alkali metals to form double salts.

Manganous Nitrate, $Mn(NO_3)_2 \cdot 6H_2O$, obtained by dissolving the carbonate in nitric acid and concentrating the solution, crystallizes from nitric acid solutions in long colourless needles, which melt at 25.8° C. and boil at 129.5° C. with some decomposition.

Manganous Carbonate, $MnCO_3$, found native as manganese spar, may be prepared as an amorphous powder by heating manganese chloride with sodium carbonate in a sealed tube to 150° C., or in the hydrated form as a white flocculent precipitate by adding sodium carbonate to a manganous salt. In the moist condition it rapidly turns brown on exposure to air.

Manganous Sulphide, MnS, found native as manganese glance, may be obtained by heating the monoxide or carbonate in a porcelain tube in a current of carbon bisulphide vapour. R. Schneider (*Pogg. Ann.*, 1874, 151, 449) obtained a crystalline variety by melting sulphur with anhydrous manganous sulphate and dry potassium carbonate, extracting the residue and drying it in a current of hydrogen. Four sulphides are known; the red and green are anhydrous, a grey variety contains much water, whilst the pink is a mixture of the grey and red (J.

C. Olsen and W. S. Rapalje, *Jour. Amer. Chem. Soc.*, 1904, 26, p. 1615). Ammonium sulphide alone gives incomplete precipitation of the sulphide. In the presence of ammonium salts the precipitate is dirty white in colour, whilst in the presence of free ammonia it is a buff colour. This form of the sulphide is readily oxidized when exposed in the moist condition, and is easily decomposed by dilute mineral acids.

Manganese Disulphide, MnS_2, found native as hauerite, is formed as a red coloured powder by heating manganous sulphate with potassium polysulphide in a sealed tube at 160°-170° C. (H. v. Senarmont, *Jour. prak. Chem.*, 1850, 51, p. 385).

Manganic Salts.—The sulphate, $Mn_2(SO_4)_3$, is prepared by gradually heating at 138° C. a mixture of concentrated sulphuric and manganese dioxide until the whole becomes of a dark green colour. The excess of acid is removed by spreading the mass on a porous plate, the residue stirred for some hours with nitric acid, again spread on a porous plate, and finally dried quickly at about 130° C. It is a dark green deliquescent powder which decomposes on heating or on exposure to moist air. It is readily decomposed by dilute acids. With potassium sulphate in the presence of sulphuric acid it forms potassium manganese alum, $K_2SO_4 \cdot Mn_2(SO_4)_2 \cdot 24H_2O$. A. Piccini (*Zeit. anorg. Chem.* 1898, 17, p. 355) has also obtained a manganese caesium alum. *Manganic Fluoride*, MnF_3, a solid obtained by the action of fluorine on manganous chloride, is decomposed by heat into manganous fluoride and fluorine. By suspending the dioxide in carbon tetrachloride and passing in hydrochloric acid gas, W. B. Holmes (*Abst. J.C.S.*, 1907, ii., p. 873) obtained a black trichloride and a reddish-brown tetrachloride.

Manganese Carbide, Mn_3C, is prepared by heating manganous oxide with sugar charcoal in an electric furnace, or by fusing

manganese chloride and calcium carbide. Water decomposes it, giving methane and hydrogen (H. Moissan); $Mn_3C + 6H_2O = 3Mn(OH)_2 + CH_4 + H_2$.

Manganates.—These salts are derived from manganic acid H_2MnO_4. Those of the alkali metals are prepared by fusing manganese dioxide with sodium or potassium hydroxide in the presence of air or of some oxidizing agent (nitre, potassium chlorate, &c.); $MnO_2 + 2KHO + O = K_2MnO_4 + H_2O$. In the absence of air the reaction proceeds slightly differently, some manganese sesquioxide being formed; $3MnO_2 + 2KHO = K_2MnO_4 + Mn_2O_3 + H_2O$. The fused mass has a dark olive-green colour, and dissolves in a small quantity of cold water to a green solution, which is, however, only stable in the presence of an excess of alkali. The green solution is readily converted into a pink one of permanganate by a large dilution with water, or by passing carbon dioxide through it: $3K_2MnO_4 + 2CO_2 = 2K_2CO_3 + 2KMnO_4 + MnO_2$.

Permanganates are the salts of permanganic acid, $HMnO_4$. The *potassium* salt, $KMnO_4$, may be prepared by passing chlorine or carbon dioxide through an aqueous solution of potassium manganate, or by the electrolytic oxidation of the manganate at the anode [German patent 101710 (1898)]. It crystallizes in dark purple-red prisms, isomorphous with potassium perchlorate. It acts as a powerful oxidizing agent, both in acid and alkaline solution; in the first case two molecules yield five atoms of available oxygen and in the second, three atoms:

$$2KMnO_4 + 3H_2SO_4 = K_2SO_4 + 2MnSO_4 + 3H_2O + 5O;$$
$$2KMnO_4 + 3H_2O = 2MnO_2 \cdot H_2O + 2KHO + 3O.$$

It completely decomposes hydrogen peroxide in sulphuric acid solution—

$$2KMnO_4 + 5H_2O_2 + 3H_2SO_4 = K_2SO_4 + 2MnSO_4 + 8H_2O + 5O_2.$$

It decomposes when heated to

$$200°\text{-}240°\ \text{C.} : 2KMnO_4 = K_2MnO_4 + MnO_2 + O_2;$$

and when warmed with hydrochloric acid it yields chlorine:

$$2KMnO_4 + 16HCl = 2KCl + 2MnCl_2 + 8H_2O + 5Cl_2.$$

Sodium Permanganate, $NaMnO_4.3H_2O$ (?), may be prepared in a similar manner, or by precipitating the silver salt with sodium chloride. It crystallizes with great difficulty. A solution of the crude salt is used as a disinfectant under the name of "Condy's fluid."

Ammonium Permanganate, $NH_4 \cdot MnO_4$, explodes violently on rubbing, and its aqueous solution decomposes on boiling (W. Muthmann, *Ber.*, 1893, 26, p. 1018); $NH_4 \cdot MnO_4 = MnO_2 + N_2 + 2H_2O$.

Barium Permanganate, $BaMn_2O_3$, crystallizes in almost black needles, and is formed by passing carbon dioxide through water containing suspended barium manganate.

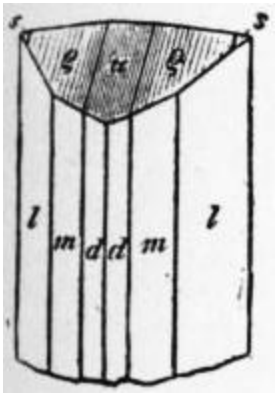
Detection.—Manganese salts can be detected by the amethyst colour they impart to a borax-bead when heated in the Bunsen flame, and by the green mass formed when they are fused with a mixture of sodium carbonate and potassium nitrate. Manganese may be estimated quantitatively by precipitation as carbonate, this salt being then converted into the oxide, Mn_3O_4 by ignition; or by precipitation as hydrated dioxide by means of ammonia and bromine water, followed

by ignition to Mn_3O_4. The valuation of pyrolusite is generally carried out by means of a distillation with hydrochloric acid, the liberated chlorine passing through a solution of potassium iodide, and the amount of iodine liberated being ascertained by means of a standard solution of sodium thiosulphate.

The atomic weight of manganese has been frequently determined. J. Berzelius, by analysis of the chloride, obtained the value 54.86; K. v. Hauer (*Sitzb. Akad. Wien.*, 1857, 25, p. 132), by conversion of the sulphate into sulphide, obtained the value 54.78; J. Dewar and A. Scott (*Chem. News*, 1883, 47, p. 98), by analysis of silver permanganate, obtained the value 55.038; J. M. Weeren (*Stahl. u. Eisen*, 1893, 13, p. 559), by conversion of manganous oxide into the sulphate obtained the value 54.883, and of the sulphate into sulphide the value 54.876 (H = 1), and finally G. P. Baxter and Hines (*Jour. Amer. Chem. Soc.*, 1906, 28, p. 1360), by analyses of the chloride and bromide, obtained 54.96 (O = 16).

MANGANITE, a mineral consisting of hydrated manganese sesquioxide, $Mn_2O_3 \cdot H_2O$, crystallizing in the orthorhombic system and isomorphous with diaspore and göthite. Crystals are prismatic and deeply striated parallel to their length; they are often grouped together in bundles. The colour is dark steel-grey to iron-black, and the lustre brilliant and submetallic: the streak is dark reddish-brown. The hardness is 4, and the specific gravity 4.3. There is a perfect cleavage parallel to the

brachypinacoid, and less perfect cleavage parallel to the prism faces *m*. Twinned crystals are not infrequent. The mineral contains 89.7% of manganese sesquioxide; it dissolves in hydrochloric acid with evolution of chlorine. The best crystallized specimens are those from Ilfeld in the Harz, where the mineral occurs with calcite and barytes in veins traversing porphyry. Crystals have also been found at Ilmenau in Thuringia, Neukirch near Schlettstadt in Alsace ("newkirkite"), Granam near Towie in Aberdeenshire, Upton Pyne near Exeter and Negaunee in Michigan. As an ore of manganese it is much less abundant than pyrolusite or psilomelane. The name manganite was given by W. Haidinger in 1827: French authors adopt F. S. Beudant's name "acerdèse," (Gr. ἀκερδής, unprofitable) because the mineral is of little value for bleaching purposes as compared with pyrolusite.



(L. J. S.)

MANGBETTU (*Monbuttu*), a negroid people of Central Africa living to the south of the Niam-Niam in the Welle district of Belgian Congo. They number about a million. Their country is a table-land at an altitude of 2500 to 2800 ft. Despite its abundant animal life, luxuriant vegetation and rich crops of plantain and oil-palm, the Mangbettu have been some of the most inveterate cannibals in Africa; but since the Congo State established posts in the country (*c.* 1895) considerable efforts have been made to stamp

out cannibalism. Physically the Mangbettu differ greatly from their negro neighbours. They are not so black and their faces are less negroid, many having quite aquiline noses. The beard, too, is fuller than in most negroes. They appear to have imposed their language and customs on the surrounding tribes, the Mundu, Abisanga, &c. Once a considerable power, they have practically disappeared as far as the original stock is concerned; their language and culture, however, remain, maintained by their subjects, with whom they have to a large extent intermixed. The men wear bark cloth, the art of weaving being unknown, the women a simple loin cloth, often not that. Both sexes paint the body in elaborate designs. As potters, sculptors, boatbuilders and masons the Mangbettu have had few rivals in Africa. Their huts, with pointed roofs, were not only larger and better built, but were cleaner than those of their neighbours, and some of their more important buildings were of great size and exhibited some skill in architecture.

See G. A. Schweinfurth, *Heart of Africa* (1874); W. Junker, *Travels in Africa* (1890); G. Casati, *Ten Years in Equatoria* (1891).

MANGEL-WURZEL, or field-beet, a variety of the common beet, known botanically as *Beta vulgaris*, var. *macrorhiza*. The name is German and means literally “root of scarcity.” R. C. A. Prior (*Popular Names of British Plants*) says it was originally mangold, a word of doubtful meaning. The so-called root consists of the much thickened primary root

together with the “hypocotyl,” *i.e.* the original stem between the root and the seed-leaves. A transverse section of the root shows a similar structure to the beet, namely a series of concentric rings of firmer “woody” tissue alternating with rings of soft thin-walled parenchymatous “bast-tissue” which often has a crimson or yellowish tint. The root is a store of carbohydrate food-stuff in the form of sugar, which is formed in the first year of growth when the stem remains short and bears a rosette of large leaves. If the plant be allowed to remain in the ground till the following year strong leafy angular aerial stems are developed, 3 ft. or more in height, which branch and bear the inflorescences. The flowers are arranged in dense sessile clusters subtended by a small bract, and resemble those of the true beet. The so-called seeds are clusters of spurious fruits. After fertilization the fleshy receptacle and the base of the perianth of each flower enlarge and the flowers in a cluster become united; the fleshy parts with the ovaries, each of which contains one seed, become hard and woody. Hence several seeds are present in one “seed” of commerce, which necessitates the careful thinning of a young crop, as several seedlings may spring from one “seed.”

This plant is very susceptible of injury from frost, and hence in the short summer of Scotland it can neither be sown so early nor left in the ground so late as would be requisite for its mature growth. But it is peculiarly adapted for those southern parts of England where the climate is too hot and dry for the successful cultivation of the turnip. In feeding quality it rivals the swede; it is much relished by livestock—pigs especially doing remarkably well upon it; and it keeps in good condition till midsummer if required. The valuable constituent of mangel is dry matter which averages about 12% as against 11% in swedes. Of this two-thirds may be sugar, which only develops fully during storage. Indeed, it is only after it has been some months in the store heap that mangel becomes a palatable and safe food for cattle. It is, moreover, exempt from the attacks of the turnip beetle. On all

these accounts, therefore, it is peculiarly valuable in those parts of Great Britain where the summer is usually hot and dry.

Up to the act of depositing the seed, the processes of preparation for mangel are similar to those described for the turnip; winter dunging being even more appropriate for the former than for the latter. The common drilling machines are easily fitted for sowing its large rough seeds, which should be sown from the beginning of April to the middle of May and may be deposited either on ridges or on the flat. The after culture is like that of the turnip. The plants are thinned out at distances of not less than 15 in. apart. Transplanting can be used for filling up of gaps with more certainty of success than in the case of swedes, but it is much more economical to avoid such gaps by sowing a little swede seed along with the mangel. Several varieties of the plant are cultivated—those in best repute being the long red, the yellow globe and the tankard, intermediate in shape. This crop requires a heavier dressing of manure than the turnip to grow it in perfection, and is much benefited by having salt mixed with the manure at the rate of 2 or 3 cwt. per acre. Nitrogenous manures are of more marked value than phosphatic manures. The crop requires to be secured in store heaps as early in autumn as possible, as it is easily injured by frost.

MANGLE. (1) A machine for pressing and smoothing clothes after washing (see LAUNDRY). The word was adopted from the Dutch; *mangel-stok* means a rolling pin, and *linnen mangelen*, to press linen by rolling;

similarly in O. Ital. *mangano* meant, according to Florio, “a presse to press buckrom,” &c. The origin of the word is to be found in the medieval Latin name, *manganum*, *mangonus* or *mangana*, for an engine of war, the “mangonel,” for hurling stones and other missiles (see CATAPULT). The Latin word was adapted from the Greek μάγγανον, a trick or device, cognate with μηχανή, a machine. (2) To cut in pieces, to damage or disfigure; to mutilate. This word is of obscure origin. According to the *New English Dictionary* it presents an Anglo-French *mahangler*, a form of *mahaigner* from which the English “maim” is derived, cf. the old form “mayhem,” surviving in legal phraseology. Skeat connects the word with the Latin *mancus*, maimed, with which “maim” is not cognate.

MANG LÖN, a state in the northern Shan states of Burma. It is the chief state of the Wa or Vü tribes, some of whom are head-hunters, and Mang Lön is the only one which as yet has direct relations with the British government. Estimated area, 3000 sq. m.; estimated population, 40,000. The state extends from about 21° 30′ to 23° N., or for 100 m. along the river Salween. Its width varies greatly, from a mile or even less on either side of the river to perhaps 40 m. at its broadest part near Taküt, the capital. It is divided into East and West Mang Lön, the boundary being the Salween. There are no Wa in West Mang Lön. Shans form the chief population, but there are Palaungs, Chinese and Yanglam, besides Lahu. The bulk of the population in East Mang Lön is Wa, but there are many Shans and Lahu. Both portions are very hilly; the only flat land is along the banks of streams

in the valleys, and here the Shans are settled. There are prosperous settlements and bazaars at Nawng Hkam and Möng Kao in West Mang Lön. The Wa of Mang Lön have given up head-hunting, and many profess Buddhism. The capital, Taküt, is perched on a hill-top 6000 ft. above sea-level. The sawbwa is a Wa, and has control over two sub-states, Mōt Hai to the north and Maw Hpa to the south.

MANGNALL, RICHMAL (1769-1820), English schoolmistress, was born, probably at Manchester, on the 7th of March 1769. She was a pupil and finally mistress of a school at Crofton Hall, near Wakefield, Yorkshire, which she conducted most successfully until her death there on the 1st of May 1820. She was the author of *Historical and Miscellaneous Questions for the Use of Young People* (1800), generally known as "Mangnall's Questions," which was prominent in the education of English girls in the first half of the 19th century.

MANGO. The mango-tree (*Mangifera indica*, natural order Anacardiaceae) is a native of tropical Asia, but is now extensively cultivated in the tropical and subtropical regions of the New as well as the Old World. It is indigenous in India at the base of the Himalayas, and in Further India and the Andaman Islands (see A. de Candolle, *Origin of Cultivated Plants*). The cultivation of the fruit must have spread at an early age over the Indian Peninsula, and it now grows everywhere in the plains. It grows rapidly to a height of 30 to 40 ft., and its dense, spreading and glossy foliage would secure its cultivation for the sake of its shade and beauty alone. Its fruit, a drupe, though in the wild variety (not to be confused with that of *Spondias mangifera*, belonging to the same order, also called wild mango in India) stringy and sour, from its containing much gallic acid, and with a disagreeable flavour of turpentine, has become sweet and luscious through culture and selection, to which we owe many varieties, differing not only in flavour but also in size, from that of a plum to that of an apple. When unripe, they are used to make pickles, tarts and preserves; ripe, they form a wholesome and very agreeable dessert. In times of scarcity the kernels also are eaten. The timber, although soft and liable to decay, serves for common purposes, and, mixed with sandal-wood, is employed in cremation by the Hindus. It is usually propagated by grafts, or by layering or inarching, rather than by seed.

See G. Watt, *Dictionary of the Economic Products of India* (1891).

MANGOSTEEN (*Garcinia Mangostana*), a tree belonging to the order Guttiferae. It is a native of the Malay Peninsula, and is extensively cultivated in southern Tenasserim, and in some places in the Madras presidency. Poor results have followed the attempt to introduce it to other countries; and A. de Candolle refers to it as one of the most local among cultivated plants both in its origin, habitation and cultivation. It belongs to a family in which the mean area of the species is very restricted. It is an evergreen about 20 ft. high, and is somewhat fir-like in general form, but the leaves are large, oval, entire, leathery and glistening. Its fruit, the much-valued mangosteen, is about the size and shape of an orange, and is somewhat similarly partitioned, but is of a reddish-brown to chestnut colour. Its thick rind yields a very astringent juice, rich in tannin, and containing a gamboge-like resin. The soft and juicy pulp is snow-white or rose-coloured, and of delicious flavour and perfume. It is wholesome, and may be administered in fever.

The genus *Garcinia* is a genus of trees containing about fifty species in the tropics of the Old World, and usually yielding a yellow gum-resin (gamboge). *G. Morella*, a native of India, yields the true gamboge.

MANGROVE. The remarkable “mangrove forests” which fringe tidal estuaries, overrun salt marshes, and line muddy coasts in the tropics of both Old and New Worlds, are composed of trees and shrubs belonging mainly to the Rhizophoraceae, but including, especially in the eastern

mangrove formations of Further India and the Malay Archipelago, members of other orders of Dicotyledons, such as Lythraceae (*Sonneratia*), Verbenaceae (*Avicennia*), and the acaulescent Nipa-palm. Their trunks and branches constantly emit adventitious roots, which, descending in arched fashion, strike at some distance from the parent stem, and send up new trunks, the forest thus spreading like a banyan grove. An advantage in dispersal, very characteristic of the order, is afforded by the seeds, which have a striking peculiarity of germination. While the fruit is still attached to the parent branch the long radicle emerges from the seed and descends rapidly towards the mud, where it may even establish itself before falling off. Owing to its clubbed shape, this is always in the right position; the plumule then makes its appearance. An interesting feature of the mangrove is the air-roots, erect or kneed branches of the roots, which project above the mud, and are provided with minute openings (stomata or lenticels), into which the air passes and is then carried by means of passages in the soft spongy tissue to the roots which spread beneath the mud. The wood of some species is hard and durable, and the astringent bark is used in tanning. The fruit of the common mangrove, *Rhizophora Mangle*, is sweet and wholesome, and yields a light wine.

MANICHAEISM. Towards the close of the 3rd century two great religions stood opposed to one another in western Europe, one wholly Iranian, namely Mithraism, the other of Jewish origin, but not without Iranian elements, part and parcel probably of the Judaism which gave it

birth, namely Christianity. Professor Franz Cumont has traced the progress of Mithraism all over the Balkan Peninsula, Italy, the Rhine-lands, Britain, Spain and Latin Africa. It was peculiarly the religion of the Roman garrisons, and was carried by the legionaries wherever they went. It was an austere religion, inculcating self-restraint, courage and honesty; it secured peace of conscience through forgiveness of sins, and abated for those who were initiated in its mysteries the superstitious terrors of death and the world to come. In these respects it resembled Christianity. Soldiers may have espoused it rather than the rival faith, because in the primitive age Christian discipline denied them the sacraments, on the ground that they were professional shedders of blood. The cumbrous mythology and cosmogony of Mithraism at last weakened its hold upon men's minds, and it disappeared during the 4th century before a victorious Catholicism, yet not until another faith, equally Iranian in its mythology and cosmological beliefs, had taken its place. This new faith was that of Mani, which spread with a rapidity only to be explained by supposing that Mithraism had prepared men's minds for its reception.

Mani professed to blend the teachings of Christ with the old Persian Magism. Kessler, the latest historian of Manichaeism, opines that Mani's own declaration on this point is not to be relied upon, and has tried to prove that it was rather of Semitic or Chaldaic origin. He certainly shows that the old Assyrian mythology influenced Mani, but not that this element did not reach him through Persian channels. In genuine Manichaean documents we only find the name Mani, but Manes, Μάνης, Manichaeus, meet us in 4th-century Greek and Latin documents. In the *Acta Archelai* his first name is said to have been Cubricus, which Kessler explains as a corruption of Shuravik, a name common among the Arabs of the Syrian desert.

Life of Mani.—According to the Mahommedan tradition, which is more trustworthy than the account contained in these *Acta*, Mani was a high-born

Persian of Ecbatana. The year of his birth is uncertain, but Kessler accepts as reliable the statement made by Biruni, that Mani was born in the year 527 of the astronomers of Babylon (A.D. 215-216). He received a careful education at Ctesiphon from his father Fatak, Babak or Patak (Πατέκιος). As the father connected himself at a later period with the confession of the *Moghtasilah*, or "Baptists," in southern Babylonia, the son also was brought up in the religious doctrines and exercises of this sect. These Baptists (see the *Fihrist*) were apparently connected with the Elkesaites and the Hemerobaptists, and certainly with the Mandaeans. It is probable that this Babylonian sect had absorbed Christian elements. Thus the boy early became acquainted with very different forms of religion. If even a small part of the stories about his father is founded on fact, it was he who first introduced Mani to that medley of religions out of which his system arose. Manichaean tradition relates that Mani received revelations while yet a boy, and assumed a critical attitude towards the religious instruction that was being imparted to him. This is the more incredible since the same tradition informs us that the boy was as yet prohibited from making public use of his new religious views. It was only when Mani had reached the age of twenty-five or thirty years that he began to proclaim his new religion. This he did at the court of the Persian king, Shāpūr I., and, according to the story, on the coronation day of that monarch (241/2). A Persian tradition says that he had previously been a Christian presbyter, but this is certainly incorrect. Mani did not remain long in Persia, but undertook long journeys for the purpose of spreading his religion, and also sent forth disciples. According to the *Acta Archelai*, his missionary activity extended westwards into the territory of the Christian church; but from Oriental sources it is certain that Mani rather went into Transoxiana, western China, and southwards as far as India. His labours there as well as in Persia were not without result. Like Mahomet after him and the founder of the Elkesaites before him, he gave himself out for the last and highest prophet, who was to surpass all previous

divine revelation, which only possessed a relative value, and to set up the perfect religion. In the closing years of the reign of Shāpūr I. (*c.* 270) Mani returned to the Persian capital, and gained adherents even at court. But the dominant priestly caste of the Magians, on whose support the king was dependent, were naturally hostile to him, and after some successes Mani was made a prisoner, and had then to flee. The successor of Shāpūr, Hōrmizd (272-273), appears to have been favourably disposed towards him, but Bahrām I. abandoned him to the fanaticism of the Magians, and caused him to be crucified in the capital in the year 276/7. The corpse was flayed, and Mani's adherents were cruelly persecuted by the king.

Mani's Writings.—Mani himself composed a large number of works and epistles, which were in great part still known to the Mahommedan historians, but are now mostly lost. The later heads of the Manichaean churches also wrote religious treatises, so that the ancient Manichaean literature must have been very extensive. According to the *Fihrist*, Mani made use of the Persian and Syriac languages; but, like the Oriental Marcionites before him, he invented an alphabet of his own, which the *Fihrist* has handed down to us. In this alphabet the sacred books of the Manichaeans were written, even at a later period. The *Fihrist* reckons seven principal works of Mani, six being in the Syriac and one in the Persian language; regarding some of these we also have information in Epiphanius, Augustine, Titus of Bostra, and Photius, as well as in the formula of abjuration (Cotelerius, *PP. Apost. Opp.* i. 543) and in the *Acta Archelai*. They are (1) *The Book of Secrets* (see *Acta Archel.*), containing discussions bearing on the Christian sects spread throughout the East, especially the Marcionites and Bardesanites, and dealing also with their conception of the Old and New Testaments; (2) *The Book of the Giants* (Demons?); (3) *The Book of Precepts for Hearers* (probably identical with the *Epistola Fundamenti* of Augustine and with the *Book of Chapters* of Epiphanius and the *Acta Archelai*;

this was the most widely spread and most popular Manichaean work, having been translated into Greek and Latin; it contained a short summary of all the doctrines of fundamental authority); (4) *The Book Shāhpūrakān* (Flügel was unable to explain this name; according to Kessler it signifies "epistle to King Shāpūr"; the treatise was of an eschatological character); (5) *The Book of Quickening* (Kessler identifies this work with the "Thesaurus [vitae]" of the *Acta Archelai*, Epiphanius, Photius and Augustine, and if this be correct it also must have been in use among the Latin Manichaeans); (6) *The Book* πραγματεία (of unknown contents); (7) a book in the Persian language, the title of which is not given in our present text of the *Fihrist*, but which is in all probability identical with the "holy gospel" of the Manichaeans (mentioned in the *Acta Archel.* and many other authorities). It was this work which the Manichaeans set up in opposition to the Gospels. Besides these principal works, Mani also wrote a large number of smaller treatises and epistles. The practice of writing epistles was continued by his successors. These Manichaean dissertations also became known in the Graeco-Roman Empire, and existed in collections.[1] There also existed a Manichaean book of memorabilia, and of prayers, in Greek, as well as many others,[2] all of which were destroyed by the Christian bishops acting in conjunction with the authorities. A Manichaean epistle, addressed to one Marcellus, has, however, been preserved for us in the *Acta Archelai*.[3]

Manichaean System.—Though the leading features of Manichaean doctrine can be exhibited clearly even at the present day, and though it is undoubted that Mani himself drew up a complete system, many details are nevertheless uncertain, since they are differently described in different sources, and it often remains doubtful which of the accounts that have been transmitted to us represents the original teaching of the founder.

The Manichaean system is one of consistent, uncompromising dualism, in the form of a fantastic philosophy of nature. The physical and the ethical are not distinguished, and in this respect the character of the system is thoroughly materialistic; for when Mani co-ordinates good with light, and evil with darkness, this is no mere figure of speech, but light is actually good and darkness evil. From this it follows that religious knowledge involves the knowledge of nature and her elements, and that redemption consists in a physical process of freeing the element of light from the darkness. Under such circumstances ethics becomes a doctrine of abstinence in regard to all elements which have their source within the sphere of darkness.

The self-contradictory character of the present world forms the point of departure for Mani's speculations. This contradiction presents itself to his mind primarily as elemental, and only in the second instance as ethical, inasmuch as he considers the sensual nature of man to be the outflow of the evil elements in nature. From the contradictory character of the world he concludes the existence of two beings, originally quite separate from each other—light and darkness. Each is to be thought of according to the analogy of a kingdom. Light presents itself to us as the good primal spirit (God, radiant with the ten [twelve] virtues of love, faith, fidelity, high-mindedness, wisdom, meekness, knowledge, understanding, mystery and insight), and then further as the heavens of light and the earth of light, with their guardians the glorious aeons. Darkness is likewise a spiritual kingdom (more correctly, it also is conceived of as a spiritual and feminine personification), but it has no "God" at its head. It embraces an "earth of darkness." As the earth of light has five tokens (the mild zephyr, cooling wind, bright light, quickening fire, and clear water), so has the earth of darkness also five (mist, heat, the sirocco, darkness and vapour). Satan with his demons was born from the kingdom of darkness. These two kingdoms stood opposed to each other from all eternity, touching each other on one

side, but remaining unmingled. Then Satan began to rage, and made an incursion into the kingdom of light, into the earth of light. The God of light, with his *syzygy*, "the spirit of his right hand," now begot the primal man, and sent him, equipped with the five pure elements, to fight against Satan. But the latter proved himself the stronger, and the primal man was for a moment vanquished. And although the God of light himself now took to the field, and with the help of new aeons (the spirit of life, &c.) inflicted total defeat upon Satan, and set the primal man free; the latter had already been robbed of part of his light by the darkness, and the five dark elements had already mingled themselves with the generations of light. It only remained now for the primal man to descend into the abyss and prevent the further increase of the generations of darkness by cutting off their roots; but he could not immediately separate again the elements that had once mingled. These mixed elements are the elements of the present visible world, which was formed from them at the command of the God of light. The forming of the world is in itself the beginning of the deliverance of the imprisoned elements of light. The world is represented as an orderly structure of various heavens and various earths, which is borne and supported by the aeons, the angels of light. It possesses in the sun and moon, which are in their nature almost quite pure, large reservoirs, in which the portions of light that have been rescued are stored up. In the sun dwells the primal man himself, as well as the glorious spirits which carry on the work of redemption; in the moon the mother of life is enthroned. The twelve constellations of the zodiac form an ingenious machine, a great wheel with buckets, which pour into the sun and moon, those shining ships that sail continually through space, the portions of light set free from the world. Here they are purified anew, and attain finally to the kingdom of pure light and to God Himself. The later Western Manichaeans termed those portions of light which are scattered throughout the world—in its elements and organisms—awaiting their deliverance, the *Jesus patibilis*.

It is significant of the materialistic and pessimistic character of the system that, while the formation of the world is considered as a work of the good spirits, the creation of man is referred to the princes of darkness. The first man, Adam, was engendered by Satan in conjunction with "sin," "cupidity," "desire." But the spirit of darkness drove into him all the portions of light he had stolen, in order to be able to dominate them the more securely. Hence Adam is a discordant being, created in the image of Satan, but carrying within him the stronger spark of light. Eve is given him by Satan as his companion. She is seductive sensuousness, though also having in her a small spark of light. But if the first human beings thus stood entirely under the dominion of the devil, the glorious spirits took them under their care from the very outset, sending aeons down to them (including Jesus), who instructed them regarding their nature, and in particular warned Adam against sensuality. But this first man fell under the temptation of sexual desire. Cain and Abel indeed are not sons of Adam, but of Satan and Eve; Seth, however, who is full of light, is the offspring of Adam by Eve. Thus did mankind come into existence, its various members possessing very different shares of light, but the men having uniformly a larger measure of it than the women. In the course of history the demons sought to bind men to themselves by means of sensuality, error and false religions (among which is to be reckoned above all the religion of Moses and the prophets), while the spirits of light carried on their process of distillation with the view of gaining the pure light which exists in the world. But these good spirits can only save men by imparting to them the true *gnosis* concerning nature and her forces, and by calling them away from the service of darkness and sensuality. To this end prophets, preachers of true knowledge, have been sent into the world. Mani, following the example of the gnostic Jewish Christians, appears to have held Adam, Noah, Abraham (perhaps Zoroaster and Buddha) to be such prophets. Probably Jesus was also accounted a prophet who had descended from the world of light—not,

however, the historical Jesus, the devilish Messiah of the Jews, but a contemporaneous phantom Jesus, who neither suffered nor died (*Jesus impatibilis*). According to the teaching of some Manichaeans, it was the primal man who disseminated the true gnosis in the character of Christ. But at all events Mani himself, on his own claim, is to be reckoned the last and greatest prophet, who took up the work of Jesus impatibilis and of Paul (for he too finds recognition), and first brought full knowledge. He is the "leader," the "ambassador of the light," the "Paraclete." It is only through his agency and that of his imitators, "the elect," that the separation of the light from the darkness can be completed. The system contains very fantastic descriptions of the processes by which the portions of light when once set free finally ascend even to the God of light. He who during his lifetime did not become one of the elect, who did not completely redeem himself, has to go through a severe process of purification on the other side of the grave, till he too is gathered to the blessedness of the light. It is erroneous, however, to ascribe, as has been done, a doctrine of transmigration to the Manichaeans. Of course men's bodies as well as the souls of the unsaved, who according to the oldest conception have in them no light whatever, fall under the sway of the powers of darkness. A later view, adapted to the Christian one, represents the portions of light in the unsaved as actually becoming lost. When the elements of light have at last been completely, or as far as possible, delivered from the world, the end of all things comes. All glorious spirits assemble, the God of light himself appears, accompanied by the aeons and the perfected just ones. The angels supporting the world withdraw themselves from their burden, and everything falls in ruins. A tremendous conflagration consumes the world; the perfect separation of the two powers takes place once more; high above is the kingdom of light, again brought into a condition of completeness, and deep below is the (? now powerless) darkness.

Ethics, Social Polity and Worship of the Manichaeans.—On the basis of such a cosmical philosophy, ethics can only have a dualistic ascetic character. Manichaean ethics is not merely negative, however, since it is necessary to cherish, strengthen and purify the elements of light, as well as free oneself from the elements of darkness. The aim is not self-destruction, but self-preservation; and yet the ethics of Manichaeism appears in point of fact as thoroughly ascetic. The Manichaean had, above all, to refrain from sensual enjoyment, shutting himself up against it by three seals—the *signaculum oris*, *manus* and *sinus*. The *signaculum oris* forbids all eating of unclean food (which included all bodies of animals, wine, &c.—vegetable diet being allowed because plants contained more light, though the killing of plants, or even plucking their fruit and breaking their twigs, was not permitted), as well as all impure speech. The *signaculum manus* prohibits all traffic with things generally, in so far as they carry in them elements of darkness. Finally, by the *signaculum sinus* every gratification of sexual desire, and hence also marriage, are forbidden. Besides all this, life was further regulated by an exceedingly rigorous system of fasts. Certain astronomical conjunctions determined the selection of the fast-days, which in their total number amounted to nearly a quarter of the year. Sunday was regularly solemnized as one, and the practice was also generally observed on Monday. Hours of prayer were determined with equal exactness. The Manichaean had to pray four times a day, each prayer being preceded by ablutions. The worshipper turned towards the sun, or the moon, or the north, as the seat of light; but it is erroneous to conclude from this, as has been done, that in Manichaeism the sun and moon were themselves objects of worship. Forms of prayer used by the Manichaeans have been preserved to us in the *Fihrist*. The prayers are addressed to the God of light, to the whole kingdom of light, to the glorious angels, and to Mani

himself, who is apostrophized in them as “the great tree, which is all salvation.” According to Kessler, these prayers are closely related to the Mandaean and the ancient Babylonian hymns. An asceticism so strict and painful as that demanded by Manichaeism could only be practised by few; hence the religion must have abandoned all attempts at an extensive propaganda had it not conceded the principle of a twofold morality. A distinction was made in the community between the *electi* (*perfecti*), the perfect Manichaeans, and the *catechumeni* (*auditores*), the secular Manichaeans. Only the former submitted themselves to all the demands made by their religion; for the latter the stringency of the precepts was relaxed. They had to avoid idolatry, sorcery, avarice, falsehood, fornication, &c.; above all, they were not allowed to kill any living being (the ten commandments of Mani). They had also to free themselves as much as possible from the world; but in truth they lived very much as their non-Manichaean fellow-citizens. We have here essentially the same condition of things as in the Catholic Church, where a twofold morality was also in force, that of the religious orders and that of secular Christians—only that the position of the electi in Manichaeism was a more distinguished one than that of the monks in Catholicism. For, after all, the Christian monks never quite forgot that salvation is given by God through Christ, whereas the Manichaean *electi* were actually themselves redeemers. Hence it was the duty of the *auditores* to pay the greatest respect and most assiduous attention to the *electi*. These “perfect ones,” wasting away under their asceticism, were objects of admiration and of the most elaborate solicitude.[4] Food was presented to them in abundance, and by their eating it the *electi* set free the portions of light from the vegetables. They prayed for the *auditores*, they blessed them and interceded for them, thereby shortening the process of purification the latter had to

pass through after death. It was only the *electi*, too, who possessed full knowledge of religious truths, a point of distinction from Catholicism.

The distinction between *electi* and *auditores*, however, does not exhaust the conception of the Manichaean Church; on the contrary, the latter possessed a hierarchy of three ranks, so that there were altogether five gradations in the community. These were regarded as a copy of the ranks of the kingdom of light. At the head stood the *teachers* ("the sons of meekness," Mani himself and his successors); then follow the *administrators* ("the sons of knowledge," the bishops); then the *elders* ("the sons of understanding," the presbyters); the *electi* ("the sons of mystery"); and finally the *auditores* ("the sons of insight"). The number of the *electi* must always have been small. According to Augustine the teachers were twelve and the bishops seventy-two in number. One of the teachers appears to have occupied the position of superior at the head of the whole Manichaean Church. At least Augustine speaks of such a personage, and the *Fihrist* also has knowledge of a chief of all Manichaeans. The constitution, therefore, had a monarchic head.

The worship of the Manichaeans must have been very simple, and must have essentially consisted of prayers, hymns and ceremonies of adoration. This simple service promoted the secret dissemination of their doctrines. The Manichaeans too, at least in the West, appear to have adapted themselves to the Church's system of festivals. The *electi* celebrated special feasts; but the principal festival with all classes was the *Bema* (βῆμα), the feast of the "teacher's chair," held in commemoration of the death of Mani in the month of March. The faithful prostrated themselves before an adorned but empty chair, which was raised upon a podium of five steps. Long fasts accompanied the feasts. The Christian and Mahommedan historians could learn little

of the Manichaean mysteries and "sacraments," and hence the former charged them with obscene rites and abominable usages. It may be held as undoubted that the later Manichaeans celebrated mysteries analogous to Christian baptism and the Lord's Supper, which may have rested upon ancient consecration rites and other ceremonies instituted by Mani himself and having their origin in nature worship.

Recent Discoveries.—F. Cumont (*Revue d'histoire et de littérature religieuse*, t. xii., 1907, No. 2) showed that one at least of the fundamental myths of Mani was borrowed from the Avesta, namely, that which recounts how through the manifestation of the virgin of light and of the messenger of salvation to the libidinous princes of darkness the vital substance or light held captive in their limbs was liberated and recovered for the realm of light. The legend of the *Omophorus* and *Splenditeneus*, rival giants who sustain earth and luminous heavens on their respective shoulders, even if it already figures in the cuneiform texts of Assyria, is yet to be traced in Mithraic bas-reliefs. It also may therefore have come to Mani through Magian channels.

When, however, we turn to the numerous fragments of authentic Manichaean liturgies and hymns lately discovered in Turfan in East Turkestan, Mani's direct indebtedness to the cycle of Magian legends rather than to Chaldaic sources (as Kessler argued) is clearly exhibited.

In fr. 472, taken from the Shāpūrakān, as part of a description of the sun-god in his ship or reservoir the sun, we have a mention of Āz and Ahriman and the devas (demons), the Pairikas. Āz in the Avestan mythology was the demon serpent who murders Gayomert in the old Persian legend, and an ally of Ahriman, as also are the *Pairikas* or Peris. In the same fragment we read of the ruin of *Ažidahāka Māzainya*, which name Darmesteter interprets in the Persian sources as the demon serpent, the sorcerer (*Ormazd et Ahriman*, Paris, 1877, p.

157). In fr. 470, descriptive of the conflagration of the world, we read of how, after Āz and the demons have been struck down, the pious man is purified and led up to sun and moon and to the being of Ahura Mazda, the Divine.

In another fragment (388) of a hymn Mani describes himself as "the first stranger" (cf. Matt. xxv. 43), the son of the god Zarvān, the Ruler-Child. In the orthodox literature of fire-worship Zarvān was Time or Destiny. Later on Zarvān was elevated to the position of supreme principle, creator of Ormazd and Ahriman, and, long before Mani, Zarvān accompanied Mithras in all his westward migrations.

In fr. 20, in an enumeration of angels, we hear of Narsus, who may be the Nēryōsang (Armenian Nerses or Narsai) of the Avesta. The other angels are Jacob, the mighty angel and leader of angels, the Lord Bar Simūs, Qaftinus the mighty, Raphael, Gabriel, Michael, Sarael and Nastikus—a truly Catholic list.

In fr. 4 a rubric enjoins the recital of the hymn of the *Frašēgērd*. Here we recognize a technical term of the Avesta—namely, the "Frashō-kereti," that is the reanimation of the world or resurrection of the dead (Darmesteter, *op. cit.*, p. 239). In this hymn we read how the gods shall release us from this sinful time, from the oppression of this world. In fr. 4, under the rubric Bar Simūs, we find the god Mihir (Mīḥryazd), the liberator, the compassionate, invoked along with Frēdōn, the good; and later on we read as follows: "with his mighty glance may the god of pure name, Prēdōn, the king and Jacob Narēman, protect religion and us the sons." Mihr or Mithras and Fēridoun or Thraētaona, the slayer of Ajis (or Azi) Dahāka, also Narīmān, spelled Nairimanau, are familiar figures in the old Persian pantheon. In the same prayer the votary begs that "new blessing may come, new victory from the god Zarvān over the glories and angels, the

spirits of this world, to the end that he accept our holy religion, become a watcher within and without, helper and protector," and the prayer ends thus: "I invoke the angels, the strong ones, the mighty, Raphael, Michael, Gabriel, Sarael, who shall protect us from all adversity, and free us from the wicked Ahriman."

In fr. 176 Jesus is invoked: "Jesus, of the gods first new moon, thou art God.... Jesus, O Lord, of waxing fame full moon, O Jesus. Lord ... light, our hearts' prayer. Jesus, God and Vahman. Sheen God! We will praise the God Narēsaf. Mār Mānī will we bless. O new moon and spring. Lord, we will bless. The angels, the gods ... New sun, Mihr."

In the above Vahman is Vohu Manō, the good thought or inspiration of the Zoroastrian religion. Mihr is Mithras. The god Narēsaf is also invoked in other fragments.

In fr. 74 is invoked, together with Jesus and Mani, the "strong mighty Zrōsch, the redeemer of souls." In the Avesta Sraosha is the angel that guards the world at night from demons, and is styled "the righteous" or "the strong."

Fr. 38 is as follows: "Mithras (MS. Mītrā) great ... messenger of the gods, mediator (or interpreter) of religion, of the elect one Jesus—virgin of light. Mār Mānī, Jesus—virgin of light, Mār Mānī. Do thou in me make peace, O light-bringer, mayest thou redeem my soul from this born-dead (existence)."

Fr. 543 runs thus: "... and ladder of the Mazdean faith. Thou, new teacher of Chorasan (of the East), and promoter of those that have the good faith. For thou wast born under a glittering star in the family of the rulers. Elect are these—Jesus and Vahman."

The above examples bear out Mani's own declaration, as reported by the *Fihrist*, that his faith was a blend of the old Magian cult with Christianity. Whether the Hebrew names of angels came to him direct from the Jews or not we cannot tell, but they were, as the Greek magical papyri prove, widely diffused among the Gentiles long before his age. The Armenian writer Eznik (*c.* 425) also attests that Mani's teaching was merely that of the Magi, *plus* an ascetic morality, for which they hated and slew him.

Just as the background of Christianity was formed by the Hebrew scriptures, and just as the Hebrew legends of the creation became the basis of its scheme of human redemption from evil, so the Avesta, with its quaint cosmogony and myths, formed the background of Mani's new faith. He seems to have quarrelled with the later Magism because it was not dualistic enough, for in fr. 28 we have such a passage as the following: "They also that adore the fire, the burning, by this they themselves recognize that their end shall be in fire. And they say that Ormuzd and Ahriman are brothers, and in consequence of this saying they shall come to annihilation." In the same fragment the Christians are condemned as worshippers of idols, unless indeed the writer has genuine pagans in view. There is a mention of Marcion in the same context, but it is unintelligible. There can be no doubt that in the form in which Mani became acquainted with it Christianity had been disengaged and liberated from the womb of Judaism which gave it birth. This presentation of it as an ethical system of universal import was the joint work of Paul and Marcion.

It remains to add that in these newly found fragments Mani styles himself "the apostle (*lit.* the sent forth) of Jesus the friend in the love of the Father, of God." He uses the formula: "Praise and laud to the Father and the Son and the Holy Spirit." In fr. 4 he attests that he was sprung from the land Babel; in fr. 566 that he was a physician from the land Babel. Fr. 3 recounts his interview with King Shāpūr I. The Gospel of Peter seems to have been

in use, for one lengthy citation is taken from it in fr. 18. The Manichaeans of Chinese Turkestan also used a version of the *Shepherd* of Hermas. Several of the hymns (*e.g.* in fr. 7 and 32) reproduce the ideas and almost the phases of the Syriac "Hymn of the Soul," so confirming the hypothesis that Mani was influenced by Bardesanes.

With the exception of a few fragments written in a Pehlevi dialect, all this recovered Manichaean literature is in the Ouigour or Vigur dialect of Tatar. The alphabet used is the one adapted by Mani himself from the Syriac estrangelo. The fragments are 800 in number, both on paper and vellum, written and adorned with the pious care and good taste which the Manichaeans are known to have bestowed on their manuscripts. They were brought back by Professor Grünwedel and Dr Huth from Turfan in East Turkestan, and were partly translated by Dr F. W. K. Müller in the *Abhandtungen der k. preuss. Akademie der Wissenschaften* (Berlin, 1904). Much of this literature is still left in Turfan, where the natives use the sheets of Vigur and Chinese vellum MSS. as window-panes in their huts. The Russian and German governments have sent out fresh expeditions to rescue what is left before it is too late. We may thus hope to recover some priceless monuments of early Christianity, hymns and treatises perhaps of Marcion and Bardesanes, the Gospel of Peter, and even the Diatessaron. Müller's translations includes a long extract of Mani's book called *Schāpūrakān*, parts of his *Evangelium*, and epistles, with liturgies, hymns and prayers, for Tatar Khāns who espoused the faith in Khorasan.

Manichaeism and Christianity.—It is very difficult to determine what was the extent of Mani's knowledge of Christianity, how much he himself borrowed from it, and through what channels it reached him. It is certain that Manichaeism, in those districts where it was brought much into contact

with Christianity, became additionally influenced by the latter at a very early period. The Western Manichaeans of the 4th and 5th centuries are much more like Christians than their Eastern brethren. In this respect Manichaeism experienced the same kind of development as Neo-Platonism. As regards Mani himself, it is safest to assume that he held both Judaism and Catholic Christianity to be entirely false religions. It is indeed true that he not only described himself as the promised Paraclete—for this designation probably originated with himself—but also conceded a high place in his system to "Jesus"; we can only conclude from this, however, that he distinguished between Christianity and Christianity. The religion which had proceeded from the historical Jesus he repudiated together with its founder, and Catholicism as well as Judaism he looked upon as a religion of the devil. But he distinguished between the Jesus of darkness and the Jesus of light who had lived and acted contemporaneously with the former. This distinction agrees with that made by the gnostic Basilides no less strikingly than the Manichaean criticism of the Old Testament does with that propounded by the Marcionites (see the *Acta Archelai*, in which Mani is made to utter the antitheses of Marcion). Finally, the Manichaean doctrines exhibit points of similarity to those of the Christian Elkesaites. The historical relation of Mani to Christianity is then as follows. From Catholicism, which he very probably had no detailed knowledge of, he borrowed nothing, rejecting it as devilish error. On the other hand, he looked upon what he considered to be Christianity proper—that is, Christianity as it had been developed among the sects of Basilidians, Marcionites, and perhaps Bardesanites, as a comparatively valuable and sound religion. He took from it the moral teaching of the Sermon on the Mount, and a criticism of the Old Testament and of Judaism so far as he required it. Indications of the influence of Marcionitism are found in the high estimation in which Mani held the apostle Paul, and in the fact that he explicitly rejects the Book of Acts. Mani appears to have given recognition

to a portion of the historical matter of the Gospels, and to have interpreted it in accordance with his own doctrine.

Manichaeism and Buddhism.—It remains to be asked whether Buddhistic elements can also be detected in Manichaeism. Most modern scholars since F. C. Baur have answered this question in the affirmative. According to Kessler, Mani made use of the teaching of Buddha, at least as far as ethics was concerned. It cannot be doubted that Mani, who undertook long journeys as far as India, knew of Buddhism. The name Buddha (Buddas) which occurs in the legendary account of Mani, and perhaps in the latter's own writings, indicates further that he had occupied his attention with Buddhism when engaged in the work of founding his new religion. But his borrowings from this source must have been quite insignificant. A detailed comparison shows the difference between Buddhism and Manichaeism in all their principal doctrines to be very great, while it becomes evident that the points of resemblance are almost everywhere accidental. This is also true of the ethics and the asceticism of the two systems. There is not a single point in Manichaeism which demands for its explanation an appeal to Buddhism. Such being the case, the relationship between the two religions remains a mere possibility, a possibility which the inquiry of Geyler (*Das System des Manichaeismus und sein Verhältniss zum Buddhismus*, Jena, 1875) has not been able to elevate into a probability.

The Secret of Manichaeism.—How are we to explain the rapid spread of Manichaeism, and the fact that it really became one of the great religions? What gave it strength was that it united an ancient mythology and a thorough-going materialistic dualism with an exceedingly simple spiritual worship and a strict morality. On comparing it with the Semitic religions of nature we perceive that it was free from their sensuous *cultus*, substituting instead a spiritual worship as well as a strict morality. Manichaeism was thus able to satisfy the new wants of an old world. It offered revelation,

redemption, moral virtue and immortality, spiritual benefits on the basis of the religion of nature. A further source of strength lay in the simple yet firm social organization which was given by Mani himself to his new institution. The wise man and the ignorant, the enthusiast and the man of the world, could all find acceptance here, and there was laid on no one more than he was able and willing to bear. Each one, however, was attached and led onward by the prospect of a higher rank to be attained, while the intellectually gifted had an additional inducement in the assurance that they did not require to submit themselves to any authority, but would be led to God by pure reason. Thus adapted from the first to individual requirements, this religion also showed itself able to appropriate from time to time foreign elements. Originally furnished from fragments of various religions, it could increase or diminish this possession without rupturing its own elastic framework. And, after all, great adaptability is just as necessary for a universal religion as a divine founder in whom the highest revelation of God may be seen and reverenced. Manichaeism indeed, though it applies the title "redeemer" to Mani, has really no knowledge of a redeemer, but only of a physical and gnostic process of redemption; on the other hand, it possesses in Mani the supreme prophet of God. If we consider in conclusion that Manichaeism gave a simple, apparently profound, and yet convenient solution of the problem of good and evil, a problem that had become peculiarly oppressive to the human race in the 2nd and 3rd centuries, we shall have named the most important factors which account for the rapid spread of the system.

Sketch of the History of Manichaeism.—Manichaeism first gained a firm footing in the East, *i.e.* in Persia, Mesopotamia and Transoxiana. The persecutions it had to endure did not hinder its extension. The seat of the Manichaean pope was for centuries in Babylon, at a later period in Samarkand. Even after the conquests of Islam the Manichaean Church continued to maintain itself, indeed it seems to have become still more

widely diffused by the victorious campaigns of the Mahommedans, and it frequently gained secret adherents among the latter themselves. Its doctrine and discipline underwent little change in the East; in particular, it drew no nearer to the Christian religion. More than once, however, Manichaeism experienced attempts at reformation; for of course the *auditores* very easily became worldly in character, and movements of reformation led temporarily to divisions and the formation of sects. Towards the close of the 10th century, at the time the *Fihirst* was written, the Manichaeans in Mesopotamia and Persia had already been in large measure ousted from the towns, and had withdrawn to the villages. But in Turkestan, and as far as the Chinese frontier, there existed numerous Manichaean communities and even whole tribes that had adopted the name of Mani. Probably it was the great migrations of the Mongolian race that first put an end to Manichaeism in Central Asia. But even in the 15th century there were Manichaeans living beside the Thomas-Christians on the coast of Malabar in India (see Germann, *Die Thomas-Christen*, 1875). Manichaeism first penetrated the Greek-Roman Empire about the year 280, in the time of the emperor Probus (see the *Chronicon* of Eusebius). If we may take the edict of Diocletian against the Manichaeans as genuine, the system must have gained a firm footing in the West by the beginning of the 4th century, but we know that as late as about the year 325 Eusebius had not any accurate knowledge of the sect. It was only subsequent to about 330 that Manichaeism spread rapidly in the Roman Empire. Its adherents were recruited on the one hand from the old gnostic sects (especially from the Marcionites—Manichaeism exerted besides this a strong influence on the development of the Marcionite churches of the 4th century), on the other hand from the large number of the "cultured," who were striving after a "rational" and yet in some manner Christian religion. Its polemics and its criticism of the Catholic Church now became the strong side of Manichaeism, especially in the West. It admitted the stumbling-blocks which the Old Testament offers to every intelligent

reader, and gave itself out as a Christianity without the Old Testament. Instead of the subtle Catholic theories concerning divine predestination and human freedom, and instead of a difficult theodicaea, it offered an exceedingly simple conception of sin and goodness. The doctrine of the incarnation of God, which was especially objectionable to those who were going over to the new universal religion from the old cults, was not proclaimed by Manichaeism. In its rejection of this doctrine Manichaeism agreed with Neo-Platonism; but, while the latter, notwithstanding all its attempts to conform itself to Christianity, could find no formula by which to inaugurate within its own limits the special veneration of Christ, the Western Manichaeans succeeded in giving their teaching a Christian tinge. The only part of the Manichaean mythology that became popular was the crude, physical dualism. The barbaric elements were judiciously screened from view as a "mystery"; they were, indeed, here and there explicitly disavowed even by the initiated. The farther Manichaeism advanced into the West the more Christian and philosophic did it become. In Syria it maintained itself in comparative purity. In North Africa it found its most numerous adherents, gaining secret support even among the clergy. Augustine was an *auditor* for nine years, while Faustus was at that time the most esteemed Manichaean teacher in the West. Augustine in his later writings against the Manichaeans deals chiefly with the following problems: (1) the relation between knowledge and faith, and between reason and authority; (2) the nature of good and evil, and the origin of the latter; (3) the existence of free will, and its relation to the divine omnipotence; (4) the relation of the evil in the world to the divine government.

The Christian Byzantine and Roman emperors, from Valens onwards, enacted strict laws against the Manichaeans. But at first these bore little fruit. The *auditores* were difficult to trace out, and besides they really gave little occasion for persecution. In Rome itself between 370 and 440

Manichaeism gained a large amount of support, especially among the scholars and public teachers. It also made its way into the life of the people by means of a popular literature in which the apostles were made to play a prominent part (*Apocryphal Acts of the Apostles*). Manichaeism in the West had also some experience of attempts at reformation from the ascetic side, but of these we know little. In Rome Leo the Great was the first who took energetic measures, along with the state authorities, against the system. Valentinian III. decreed banishment against its adherents, Justinian the punishment of death. In North Africa Manichaeism appears to have been extinguished by the persecution of the Vandals. But it still continued to exist elsewhere, both in the Byzantine Empire and in the West, and in the earlier part of the middle ages it gave an impulse to the formation of new sects, which remained related to it. And if it has not been quite proved that so early as the 4th century the Priscillianists of Spain were influenced by Manichaeism, it is at least undoubted that the Paulicians and Bogomiles, as well as the Catharists and the Albigenses, are to be traced back to Manichaeism (and Marcionitism). Thus the system, not indeed of Mani the Persian, but of Manichaeism as modified by Christian influences, accompanied the Catholic Church until the 13th century.

Sources.—(*a*) Oriental. Among the sources for a history of Manichaeism the most important are the Oriental. Of these the Mahommedan, though of comparatively late date, are distinguished by the excellent manner in which they have been transmitted to us, as well as by their impartiality. They must be named first, because ancient Manichaean writings have been used in their construction. At the head of all stands En-Nedīm, *Fihrist* (*c.* 980), ed. by Flügel (1871-1872); cf. the latter's work *Mani, seine Lehre u. seine Schriften* (1862). See also Shahrastānī, *Kitab al-milal wan-nuḥal* (12th cent.), ed. by Cureton (1846) and translated into German by Haarbrücker (1851), and individual notes and excerpts by Tabarī (10th cent.), Al-Bīrūnī (11th cent.), and other Arabian and Persian historians. Next come the Turfan fragments described in the body of this article. See also W. Brandt, *Schriften aus der Genza oder Sidvā Rabba* (Göttingen, 1893).

Of the Christian Orientals those that afford most information are Ephraem Syrus (d. 373), in various writings; the Armenian Esnik (German translation by J. M. Schmid, Vienna, 1900, see also *Zeitsch. f. hist. Theol.*, 1840, ii.; Langlois, *Collection*, ii. 375 seq.), who wrote in the 5th century against Marcion and Mani; and the Alexandrian patriarch Eutychius (d. 916), *Annales*, ed. Pococke (1628). There are, besides, scattered pieces of information in Aphraates (4th cent.), Barhebraeus (13th cent.) and others. The newly found Syriac *Book of Scholia* of Theodor bar Khouni (see Pognon, *Les Coupes de Kouabir*, Paris, 1898) gives many details about Mani's teaching (also ed. without translation by Dr M. Lewin, Berlin, 1905).

(*b*) Greek and Latin. The earliest mention of the Manichaeans in the Graeco-Roman Empire is to be found in an edict of Diocletian (see Hänel, *Cod. Gregor.*, tit. xv.), which is held by some to be spurious, while others assign it to one or other of the years 287, 290, 296, 308

(so Mason, *The Persec. of Diocl.*, pp. 275 seq.). Eusebius gives a short account of the sect (*H. E.*, vii. 31). It was the *Acta Archelai*, however, that became the principal source on the subject of Manichaeism for Greek and Roman writers. These *Acta* are not indeed what they give themselves out for, viz. an account of a disputation held between Mani and the bishop Archelaus of Cascar, in Mesopotamia; but they nevertheless contain much that is trustworthy, especially regarding the doctrine of Mani, and they also include Manichaean documents. They consist of various distinct pieces, and originated in the beginning of the 4th century, probably at Edessa. They were translated as early as the first half of the same century from the Syriac (as is maintained by Jerome, *De vir. illust.*, 72; though this is doubted by modern scholars) into Greek, and soon afterwards into Latin. It is only this secondary Latin version that we possess (ed. by C. H. Beeson; Leipzig, 1906, under title *Hegemonius acta Archelai*); earlier editions, Zacagni (1698); Routh, *Reliquiae sac.*, vol. v. (1848); translated in Clark's *Ante-Nicene Library*, vol. xx.; small fragments of the Greek version have been preserved. Regarding the *Acta Archelai*, see Zittwitz in *Zeitschr. f. d. histor. Theol.* (1873) and Oblasinski, *Acta disp. Arch. el Manetis* (1874). In the form in which we now possess them, they are a compilation after the pattern of the *Clementine Homilies*, and have been subjected to manifold redactions. These *Acta* were used by Cyril of Jerusalem (*Catech.* 6), Epiphanius (*Haer.* 66), and a great number of other writers. All the Greek and Latin heresiologists have included the Manichaeans in their catalogues; but they seldom adduce any independent information regarding them (see Theodoret, *Haer. fab.* i. 26). Important matter is to be found in the resolutions of the councils from the 4th century onwards (see Mansi, *Acta concil.*, and Hefele, *Conciliengeschichte*, vols. i.-iii.), and also in the controversial writings of Titus of Bostra (6th century), Πρὸς Μανιχαίους (ed. Lagarde,

1859), and of Alexander of Lycopolis Λόγος πρὸς τὰς Μανιχαίου δόξας (ed. Combefis; transl. in *Ante-Nic. Lib.*, vol. xiv.). Of the Byzantines, the most worthy of mention are John of Damascus (*De haeres.* and *Dialog.*) and Photius (*cod.* 179 *Biblioth.*). The struggle with the Paulicians and the Bogomiles, who were often simply identified with the Manichaeans, again directed attention to the latter. In the West the works of Augustine are the great repertory for information on the subject of Manichaeism (*Contra epistolam Manichaei, quam vocant fundamenti*; *Contra Faustum Manichaeum*; *Contra Fortunatum*; *Contra Adimantum*; *Contra Secundinum*; *De actis cum Felice Manichaeo*; *De genesi c. Manichaeos*; *De natura boni*; *De duabus animabus*; *De utilitate credendi*; *De moribus eccl. cathol. et de moribus Manichaeorum*; *De haeres.*). The more complete the picture, however, which may here be obtained of Manichaeism, the more cautious must we be in making generalizations from it, for it is beyond doubt that Western Manichaeism adopted Christian elements which are wanting in the original and in the Oriental Manichaeism. The "Dispute of Paul the Persian with a Manichaean" in Migne *P.G.*, 88, col. 529-578 (first ed. by A. Mai) is shown by G. Mercati, *Studi e testi* (Rome, 1901) to be the *procès verbal* of an actual discussion held under Justinian at Constantinople in 527.

LITERATURE.—The most important works on Manichaeism are Beausobre, *Hist. critique de Manichée et du Manichéisme* (2 vols., 1734 seq.; the Christian elements in Manichaeism are here strongly, indeed too strongly, emphasized); Baur, *Das manich. Religionssystem* (1831; in this work Manichaean speculation is exhibited from a speculative standpoint); Flügel, *Mani* (1862; a very careful investigation on the basis of the *Fihrist*); Kessler, *Untersuchung zur Genesis des manich. Religionssystems* (1876); and the article "Mani, Manichäer," by the same writer in Herzog-Hauck's *R.E.*, xii. 193-228;

Kessler, *Mani* (2 vols., Berlin, 1889, 1903); Ernest Rochat, *Essai sur Mani et sa doctrine* (Geneva, 1897); *Recherches sur le manichéisme: I. La cosmogonie manichéisme d'après Théodore Bar Khôui*, by Franz Cumont (Brussels, 1908); *II. Fragments syriaques d'ouvrages manichéens*, by Kugener and F. Cumont. *III. Les Formules grecques d'abjuration imposées aux manichéens*, by F. Cumont. The accounts of Mosheim, Lardner, Walch and Schröckh, as well as the monograph by Trechsel, *Ueber Kanon, Kritik und Exegese der Manichäer* (1832), may also be mentioned as still useful. The various researches which have been made regarding Parsism, the ancient Semitic religions, Gnosticism, &c., are of the greatest importance for the investigation of Manichaeism.

(A. Ha.; F. C. C.)

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1 A βιβλίον ἐπιστολῶν is spoken of in the formula of abjuration, and an *Epistola ad virginem Menoch* by Augustine. Fabricius has collected the "Greek Fragments of Manichaean Epistles" in his *Bibliotheca Graeca* (vii. 311 seq.).

2 The *Canticum amatorium* is cited by Augustine.

3 Zittwitz assumes that this epistle was in its original form of much larger extent, and that the author of the *Acts* took out of it the matter for the speeches which he makes Mani deliver during his disputation with Bishop Archelaus. The same scholar traces back the account by Turbo in the *Acts*, and the historical data given in the fourth section, to the writings of Turbo, a Mesopotamian, who is assumed to have been a Manichaean renegade and a Christian. But as to this difference of opinion is at least allowable.

4 Analogous to this is the veneration in which the Catholic monks and the Neoplatonic "philosophers" were held; but the prestige of the Manichaean *electi* was greater than that of the monks and the philosophers.

MANIFEST (Lat. *manifestus*, clear, open to view), in commercial law, a document delivered to the officer of customs by the captain of a ship before leaving port, giving a description of the shipped goods of every kind, and setting forth the marks, numbers and descriptions of the packages and the names of the consignors thereof. In England, by the Revenue Act 1884, s. 3, where goods are exported for which no bond is required, a manifest must be delivered to the officer of customs by the master or owner of the ship within six days after the final clearance, or a declaration in lieu thereof, the penalty in default being a sum not exceeding five pounds.

MANIHIKI (Manahiki, Monahiki), a scattered archipelago in the central Pacific Ocean, between 4° and 11° S., and 150° and 162° W., seldom visited, and producing only a little copra and guano. It may be taken to include the Caroline or Thornton Islands, Vostok and Flint to the east; Suvarov, Manihiki or Humphrey, and Tongareva or Penrhyn to the west, and Starbuck and Malden to the north, the whole thus roughly forming the three corners of a triangle. There are pearl and pearl-shell fisheries at

Tongareva and Suvarov. The natives (about 1000) are Polynesians and nominally Christian. There are ancient stone buildings of former inhabitants on Malden Island. The islands were mostly discovered early in the 19th century, and were annexed by Great Britain mainly in 1888-1889.

MANIKIALA, a village of India, in Rawalpindi district of the Punjab. Pop. (1901), 734. It contains one of the largest *stupas* or Buddhist memorial shrines in N. India, and the one first known to Europeans, who early detected traces of Greek influence in the sculpture. The *stupa* was excavated by General Court in 1834, and has been identified by Sir A. Cunningham with the scene of Buddha's "body-offering."

MANILA, the capital city and principal port of the Philippine Islands, situated on the W. coast of the island of Luzon, on the E. shore of Manila Bay, at the mouth of the Pasig river, in lat. 14° 35′ 31″ N., and in long. 120° 58′ 8″ E. It is about 4890 m. W.S.W. of Honolulu, 6990 m. W.S.W. of San Francisco, 628 m. S.E. of Hong-Kong, and 1630 m. S. by W.

of Yokohama. Pop. (1876), 93,595; (1887), 176,777; (1903), 219,928. Of the total population in 1903, 185,351 were of the brown race, 21,838 were of the yellow race, 7943 were of the white race, and 232 were of the black race (230 of those of this race were foreign-born), and 4564 were of mixed races; of the same total 131,659, or nearly 60% were males. The foreign-born in 1903 numbered 29,491, comprising 21,083 natives of China, 4300 natives of the United States of America, 2065 natives of Spain, and 721 natives of Japan. Nearly all of the brown race were native-born, and 80.6% of them were Tagalogs.

The city covers an area of about 20 sq. m. of low ground, through which flow the Pasig river and several *esteros*, or tidewater creeks. To the west is the broad expanse of Manila Bay, beyond which are the rugged Mariveles Mountains; to the eastward the city extends about half-way to Laguna de Bay, a lake nearly as large as Manila Bay and surrounded on three sides by mountains. On the south bank of the Pasig and fronting the bay for nearly a mile is the "Ancient City," or Intramuros, enclosed by walls 2½ m. long, with a maximum height of 25 ft., built about 1590. Formerly a moat flanked the city on the land sides, and a drawbridge at each of six gates was raised every night. But this practice was discontinued in 1852 and the moat was filled with earth in 1905. In the north-west angle of the walled enclosure stands Fort Santiago, which was built at the same time as the walls to defend the entrance to the river; the remaining space is occupied largely by a fine cathedral, churches, convents, schools, and government buildings. Outside the walls the modern city has been formed by the union of several towns whose names are still retained as the names of districts. The Pasig river is crossed by two modern steel cantilever bridges. Near the north-east angle of Intramuros is the Bridge of Spain, a stone structure across the Pasig, leading to Binondo, the principal shopping and financial district; here is the Escolta, the most busy thoroughfare of the city, and the Rosario, noted for its Chinese shops. Between Binondo and the bay is San Nicholas,

with the United States custom-house and large shipping interests. North of San Nicholas is Tondo, the most densely populated district; in the suburbs, outside the fire limits, the greater part of the inhabitants live in native houses of bamboo frames roofed and sided with nipa palm, and the thoroughfares consist of narrow streets and navigable streams. Paco, south-west of Intramuros, has some large cigar factories, and a large cemetery where the dead are buried in niches in two concentric circular walls. Ermita and Malate along the bay in the south part of the city, San Miguel on the north bank of the river above Intramuros, and Sampaloc farther north, are the more attractive residential districts.

Most of the white inhabitants live in Ermita and Malate, or in San Miguel, where there are several handsome villas along the river front, among them that of the governor-general of the Philippines. The better sort of houses in Manila have two storeys, the lower one built of brick or stone and the upper one of wood, roofed with red Spanish tile or with corrugated iron; the upper storey contains the living-rooms, and the lower has servants' rooms, storehouses, stables, carriage-houses and poultry yards. On account of the warm climate the cornices are wide, the upper storey projects over the lower, and the outer walls are fitted with sliding frames. Translucent oyster shells are a common substitute for glass; and the walls are white-washed, but on account of the frequency of earthquakes are not plastered. More than one half of the dwellings in the city are mere shacks or nipa huts. Few of the public buildings are attractive or imposing. There are, however, some churches with graceful towers and beautiful façades and a few attractive monuments; among the latter are one standing on the Magellan Plaza (Plaza or Paseo de Magellanes) beside the Pasig, to the memory of Ferdinand Magellan, the discoverer of the islands; and another by A. Querol on the shore of the bay, to the memory of Don Miguel de Legaspi (d. 1572), the founder of the Spanish city, and of

Andres de Urdaneta (1498-1568), the Augustinian friar who accompanied Legaspi to Cebu (but not to what is now Manila).

Many improvements have been made in and about the city since the American occupation in 1898. The small tram-cars drawn by native ponies have been replaced by a modern American electric street-railway service, and the railway service to and from other towns on the island of Luzon has been extended; in 1908, 267 m. were open to traffic and 400 m. were under construction. Connected with Manila by electric railway is Fort William McKinley, a U.S. army post in the hills five miles away, quartering about 3000 men. The scheme for dredging some of the *esteros* in order to make them more navigable and for filling in others has been in part executed. But the greatest improvement affecting transportation is the construction of a safe and deep harbour. Although Manila Bay is nearly landlocked, it is so large that in times of strong winds it becomes nearly as turbulent as the open sea, and it was formerly so shallow that vessels drawing more than 16 ft. could approach no nearer than two miles to the shore, where typhoons of the south-west monsoon not infrequently obliged them to lie several days before they could be unloaded. Two long jetties or breakwaters have now been constructed, about 350 acres of harbour area have been dredged to a depth of 30 ft., and two wharves of steel and concrete, one 600 ft. long and 70 ft. wide, and the other 650 ft. long and 110 ft. wide, were in process of construction in 1909. The Pasig river has been dredged up to the Bridge of Spain to a depth of 18 ft. and from the Bridge of Spain to Laguna de Bay to a depth of 6 ft. The construction of the harbour was begun about 1880 by the Spanish government, but the work was less than one-third completed when the Americans took possession. Among other American improvements were: an efficient fire department, a sewer system whereby the sewage by means of pumps is discharged into the bay more than a mile from the shore; a system of gravity waterworks (1908) whereby the city's water supply is taken from the Mariquina river about 23 m. from the city

into a storage reservoir which has a capacity of 2,000,000,000 gallons and is 212 ft. above the sea; the extension of the Luneta, the principal pleasure-ground; a boulevard for several miles along the bay; a botanical garden; and new market buildings.

Climate.—Manila has a spring and summer hot season, an autumn and winter cooler season, a summer and autumn rainy season, and a winter and spring dry season. For the twenty years 1883-1902 the annual average of mean monthly temperatures was 26.8° C., the maximum being 27.4° in 1889 and 1897, and the minimum 26.2° in 1884. From May until October the prevailing wind is south-east, from November to January it is north, and from February to April it is east. July and August are the cloudiest months of the year; the average number of rainy days in each of those months being 21, and in February or March only 3. The annual average of rainy days is 138: 94 in the wet season (average precipitation for the six months, 1556.3 mm.) and 44 in the dry season (average precipitation for the six dry months, 382 mm.). Thunderstorms are frequent and occasionally very severe, between May and September; the annual average of thunderstorms for the decennium 1888-1897 was 505, the greatest frequency was in May (average 100.3) and in June (average 90.7); the severity of these storms may be imagined from the fact that in a half-hour between 5 and 6 P.M. on the 21st of May 1892 the fall (probably the maximum) was 60 mm. The air is very damp: for the period 1883-1902 the annual average of humidity was 79.4%, the lowest average for any one month was 66.6% in April 1896 (the average for the twenty Aprils was 70.7), and the highest average for any one month was 89.9% for September 1897 (the average for the twenty Septembers was 85.5). The city is so situated as to be affected by shocks from all the various seismological centres of Luzon, especially those from the active volcano Taal, 35 m. south of the city. At the Manila observatory,

about 1 m. south-east of the walled city, the number of perceptible earthquakes registered by seismograph between 1880 and 1897 inclusive was 221; the greatest numbers for any one year were 26 in 1882 and 23 in 1892, and the least, 5 in 1896 and 6 in 1889 and in 1894; the average number in each May was 1.44, in each July, 1.33, and in January and in February 0.72; the frequency is much greater in each of the spring summer months (except June, average 0.78) than in the months of autumn and winter.

Public Institutions.—The public school system of Manila includes, besides the common schools and Manila high school, the American school, the Philippine normal school (1901), the Philippine school of arts and trades (1901), the Philippine medical school (1907) and the Philippine school of commerce (1908). The Philippine government also maintains here a bureau of science which publishes the monthly *Philippine Journal of Science*, and co-operates with the Jesuits in maintaining, in Ermita, the Manila observatory (meteorological, seismological and astronomical), which is one of the best equipped institutions of the kind in the East. The royal and pontifical university of St Thomas Aquinas (generally known as the university of Santo Tomas) was founded in 1857 with faculties of theology, law, philosophy, science, medicine and pharmacy, and grew out of a seminary, for the foundation of which Philip II. of Spain gave a grant in 1585, and which opened in 1601; and of the Dominican college of St Thomas, dating from 1611. Other educational institutions are the (Dominican) San José medical and pharmaceutical college, San Juan de Letrán (Dominican), which is a primary and secondary school, the ateneo municipal, a corresponding secondary and primary school under the charge of the Jesuits, and the college of St Isabel, a girls' school. In 1908 there were thirty-four newspapers and periodicals published in the city, of which thirteen were Spanish, fourteen were English, two

were Chinese, and five were Tagalog; the principal dailies were the *Manila Times*, *Cablenews American*, *El Comercio*, *El Libertas*, *El Mercantil*, *El Renacimiento* and *La Democracia*. There are several Spanish hospitals in Manila, in two of which the city's indigent sick are cared for at its expense; in connexion with another a reform school is maintained; and there are a general hospital, built by the government, a government hospital for contagious diseases, a government hospital for government employees, a government hospital for lepers, an army hospital, a free dispensary and hospital supported by American philanthropists, St Paul's hospital (Roman Catholic), University hospital (Protestant Episcopal), and the Mary Johnson hospital (Methodist Episcopal). There are several American Protestant churches in the city, notably a Protestant Episcopal cathedral and training schools for native teachers. In Bibilid prison, in the Santa Cruz district, nearly 80% of the prisoners of the archipelago are confined; it is under the control of the department of public instruction and its inmates are given an opportunity to learn one or more useful trades.

Trade and Industry.—Manila is important chiefly for its commerce, and to make it the chief distributing point for American goods consigned to Eastern markets the American government undertook the harbour improvements, and abolished the tonnage dues levied under Spanish rule. Manila is the greatest hemp market in the world; 110,399 tons, valued at $19,444,769, were exported from the archipelago in 1906, almost all being shipped from Manila. Other important exports are sugar, copra and tobacco. The imports represent a great variety of food stuffs and manufactured articles. In 1906 the total value of the exports was $23,902,986 and the total value of the imports was $21,868,257. The coastwise trade is large. The principal manufactures are tobacco, cigars, cigarettes, malt liquors, distilled liquors, cotton fabrics, clothing, ice, lumber, foundry and machine shop products,

carriages, waggons, furniture and boots and shoes. There is some ship and boat building. Lumber is sawed by steam power, and cotton mills in the Tondo district are operated by steam. In the foundries and machine shops small engines, boilers and church bells are made, and the government maintains an ice and cold-storage plant. With these exceptions manufacturing is in a rather primitive state. Another industry of importance, especially in the district of Tondo, is fishing, and the city's markets are well supplied with many varieties of choice fish.

Administration.—Manila is governed under a charter enacted in 1901 by the Philippine commission, and amended in 1903. This vests the legislative and administrative authority mainly in a municipal board of five members, of whom three are appointed by the governor of the Philippines by the advice and with the consent of the Philippine commission, and the others are the president of the advisory board and the city engineer. The administration is divided into eight departments: engineering and public works; sewer and waterworks construction; sanitation and transportation; assessments and collections; police, fire, law and schools. There are no elective offices, but there is an advisory board, appointed by the governor and consisting of one member from each of eleven districts; its recommendations the municipal board must seek on all important matters. The administration of justice is vested in a municipal court and in one court under justices of the peace and auxiliary justices; the administration of school affairs is vested in a special board of six members; and matters pertaining to health are administered by the insular bureau of health.

History.—The Spanish city of Manila (named from "nilad," a weed or bush which grew in the locality) was founded by Legaspi in 1571. The site had been previously occupied by a town under a Mahommedan chieftain, but this town had been burned before Legaspi gained possession, although a

native settlement still remained, within the present district of Tondo. In 1572, while its fortifications were still slight, the Spanish city was attacked and was nearly captured by a force of Chinese pirates who greatly outnumbered the Spaniards. About 1590 the construction of the present walls and other defences was begun. At the beginning of the 17th century Manila had become the commercial metropolis of the Far East. To it came fleets from China, Japan, India, Malacca and other places in the Far East for an exchange of wares, and from it rich cargoes were sent by way of Mexico to the mother country in exchange for much cheaper goods. Before the close of the century, however, a decline began, from which there was but little recovery under Spanish rule. Several causes contributed to this, among them the waning of the power of Spain, an exclusive commercial policy, dishonest administration, hostilities with the Chinese, ravages of the Malay pirates, and the growth of Dutch commerce. On several occasions the city has been visited with destructive earthquakes; those of 1645 and 1863 were especially disastrous. In 1762, during war between England and Spain, an English force under Vice-Admiral Sir Samuel Cornish (d. 1770) and Lieut.-General Sir William Draper (1721-1787) breached the walls and captured the city, but by the Treaty of Paris (1763) it was returned to Spain. In 1837 the port of Manila was opened to foreign trade, and there was a steady but slow increase in prosperity up to about 1890. During this period, however, progress was hampered by vested interests, and the spirit of rebellion among the natives became increasingly threatening. About 1892 a large number of Filipinos in and near Manila formed a secret association whose object was independence and separation from Spain. In August 1896 members of this association began an attack; and late in December the movement was reinforced as a result of the execution in Manila of Dr José Rizal y Mercado (1861-1896), a Filipino patriot. It spread to the provinces, and was only in part suppressed when, in April 1898, the United States declared war against Spain. On the 1st of May an American fleet under

Commodore George Dewey destroyed the Spanish fleet stationed in Manila Bay (see SPANISH-AMERICAN WAR). The smouldering Filipino revolt then broke out afresh and an American army under General Wesley Merritt (1836-) was sent from San Francisco to assist in capturing the city. The Spaniards, after making a rather weak defence, surrendered it on the 13th of August 1898. Trouble now arose between the Americans and the Filipinos under the leadership of Emilio Aguinaldo, for the latter wished to establish a government of their own. On the night of the 4th of February 1899 the Filipinos attacked the American army which was defending the city, but were repulsed after suffering a heavy loss. A military government, however, was maintained in the city until August 1901.

MANILA HEMP, the most valuable of all fibres for cordage, the produce of the leaf-stalks of *Musa textilis*, a native of the Philippine Islands. The plant, called *abacá* by the islanders, throws up a spurious stem from its underground rootstocks, consisting of a cluster of sheathing leaf-stalks, which rise to a height of from 15 to 25 ft. and spread out into a crown of huge undivided leaves characteristic of the various species of *Musa* (plantain, banana, &c.). From 12 to 20 clusters are developed on each rhizome. In its native regions the plant is rudely cultivated solely as a source of fibre; it requires little attention, and when about three years old develops flowers on a central stem, at which stage it is in the most favourable condition for yielding fibre. The stock is then cut down, and the sheathing stalks are torn asunder and reduced to small strips. These strips in

their fresh succulent condition are drawn between a knife-edged instrument and a hard wooden block to which it is fixed. The knife is kept in contact with the block except when lifted to introduce the ribbons. Sufficient weight is suspended to the end of the knife to keep back all pith when the operator is drawing forward the ribbon between the block and knife. By repeated scraping in this way the soft cellular matter which surrounds the fibre is removed, and the fibre so cleaned has only to be hung up to dry in the open air, when, without further treatment, it is ready for use. Each stock yields, on an average, a little under 1 ℔ of fibre; and two natives cutting down plants and separating fibre will prepare not more than 25 ℔ per day. The fibre yielded by the outer layer of leaf-stalks is hard, fully developed and strong, and used for cordage, but the produce of the inner stalks is increasingly thin, fine and weak. The finer fibre is used by the natives, without spinning or twisting (the ends of the single fibres being knotted or gummed together), for making exceedingly fine, light and transparent yet comparatively strong textures, which they use as articles of dress and ornament. According to Warden, “muslin and grass-cloth are made from the finest fibres of Manila hemp, and some of them are so fine that a garment made of them may, it is said, be enclosed in the hollow of the hand.” In Europe, especially in France, articles of clothing, such as shirts, veils, neckerchiefs and women’s hats, are made from *abacá*. It is also used for matting and twines. It is of a light colour, very lustrous, and possesses great strength, being thus exceptionally suitable for the best class of ropes. It is extensively used for marine and other cordage. The hemp exported for cordage purposes is a somewhat woody fibre, of a bright brownish-white colour, and possessing great durability and strain-resisting power. The strength of Manila hemp compared with English hemp is indicated by the fact that a Manila rope 3¼ in. in circumference and 2 fathoms long stood a strain of 4669 ℔ before giving way, while a similar rope of English hemp broke with 3885 ℔. The fibre contains a very considerable amount of

adherent pectinous matter, and in its so-called dry condition an unusually large proportion, as much as 12% of water. In a damp atmosphere the fibre absorbs moisture so freely that it has been found to contain not less than 40% of water, a circumstance which dealers in the raw fibre should bear in mind. From the old and disintegrated ropes is made the well-known manila paper. The plant has been introduced into tropical lands—the West Indies, India, Borneo, &c.—but only in the Philippines has the fibre been successfully produced as an article of commerce. It is distributed throughout the greater part of the Philippine Archipelago. The area of successful cultivation lies approximately between 6° and 15° N. and 121° and 126° E.; it may be successfully cultivated up to about 4000 ft. above sea-level. The provinces, or islands, where cultivation is most successful are those with a heavy and evenly distributed rainfall. H. T. Edwards, fibre expert to the Philippine bureau of agriculture, wrote in 1904:—

> "The opportunities for increasing the production of *abacá* in the Philippines are almost unlimited. Enormous areas of good *abacá* land are as yet untouched, while the greater part of land already under cultivation might yield a greatly increased product if more careful attention were given to the various details of cultivation. The introduction of irrigation will make possible the planting of *abacá* in many districts where it is now unknown. The *perfection* of a machine for the extraction of the fibre will increase the entire output by nearly one-third, as this amount is now lost by the wasteful hand-stripping process."

Hitherto, while numerous attempts have been made to extract the fibre with machinery, some obstacle has always prevented the general use of the process. The exports have increased with great rapidity, as shown by the following table:—

1870	31,426	tons.

1880	50,482	”
1890	67,864	”
1900	89,438	”
1904	121,637	”

In 1901 the value of the export was $14,453,410, or 62.3% of the total exports from the Philippines. The fibre is now so valuable that Manila hemp cordage is freely adulterated by manufacturers, chiefly by admixture of phormium (New Zealand flax) and Russian hemp.

MANILIUS, a Roman poet, author of a poem in five books called *Astronomica*. The author is neither quoted nor mentioned by any ancient writer. Even his name is uncertain, but it was probably Marcus Manilius; in the earlier MSS. the author is anonymous, the later give Manilius, Manlius, Mallius. The poem itself implies that the writer lived under Augustus or Tiberius, and that he was a citizen of and resident in Rome. According to R. Bentley he was an Asiatic Greek; according to F. Jacob an African. His work is one of great learning; he had studied his subject in the best writers, and generally represents the most advanced views of the ancients on astronomy (or rather astrology). He frequently imitates Lucretius, whom he resembles in earnestness and originality and in the power of enlivening the dry bones of his subject. Although his diction presents some peculiarities, the style is metrically correct. Firmicus, who wrote in the time of Constantine, exhibits so many points of resemblance with the work of Manilius that he must either have used him or have followed some work

that Manilius also followed. As Firmicus says that hardly any Roman except Caesar, Cicero and Fronto had treated the subject, it is probable that he did not know the work of Manilius. The latest event referred to in the poem (i. 898) is the great defeat of Varus by Arminius in the Teutoburgiensis Saltus (A.D. 9). The fifth book was not written till the reign of Tiberius; the work appears to be incomplete, and was probably never published.

See editions by J. Scaliger (1579); R. Bentley (1739); F. Jacob (1846); A. G. Pingré (1786); and T. Breiter (Leipzig, 1907; and commentary 1909); of book i. by A. E. Housman (1903). On the subject generally see M. Bechert, *De emendandi Manilii Ratione* (1878) and *De M. M. Astronomicorum Poeta* (1891); B. Freier, *De M. Astronom. Aetate* (1880); A. Cramer, *De Manilii Elocutione* (very full; 1882); G. Lanson, *De Manilio Poeta*, with select bibliog. (1887); P. Monceaux, *Les Africains* (a study of the Latin literature of Africa; 1894); R. Ellis, *Noctes Manilianae* (1891); J. P. Postgate, *Silva Maniliana* (1897), chiefly on textual questions; P. Thomas, *Lucubrationes Manilianae* (1888), a collation of the Gemblacensis (Gembloux) MS.; F. Plessis, *La Poesie latine* (1909), pp. 477-483.

MANILIUS, GAIUS, Roman tribune of the people in 66 B.C. At the beginning of his year of office (Dec. 67) he succeeded in getting a law passed (*de libertinorum suffragiis*), which gave freedmen the privilege of

voting together with those who had manumitted them, that is, in the same tribe as their patroni; this law, however, was almost immediately declared null and void by the senate. Both parties in the state were offended by the law, and Manilius endeavoured to secure the support of Pompey by proposing to confer upon him the command of the war against Mithradates with unlimited power (see POMPEY). The proposal was supported by Cicero in his speech, *Pro lege Manilia*, and carried almost unanimously. Manilius was later accused by the aristocratical party on some unknown charge and defended by Cicero. He was probably convicted, but nothing further is heard of him.

See Cicero's speech; Dio Cassius xxxvi. 25-27; Plutarch, *Pompey*, 30; Vell. Pat. ii. 33; art. ROME: *History*, § II.

MANIN, DANIELE (1804-1857), Venetian patriot and statesman, was born in Venice, on the 13th of May 1804. He was the son of a converted Jew, who took the name of Manin because that patrician family stood sponsors to him, as the custom then was. He studied law at Padua, and then practised at the bar of his native city. A man of great learning and a profound jurist, he was inspired from an early age with a deep hatred for Austria. The heroic but foolhardy attempt of the brothers Bandiera, Venetians who had served in the Austrian navy against the Neapolitan Bourbons in 1844, was the first event to cause an awakening of Venetian patriotism, and in 1847 Manin presented a petition to the Venetian

congregation, a shadowy consultative assembly tolerated by Austria but without any power, informing the emperor of the wants of the nation. He was arrested on a charge of high treason (Jan. 18, 1848), but this only served to increase the agitation of the Venetians, who were beginning to know and love Manin. Two months later, when all Italy and half the rest of Europe were in the throes of revolution, the people forced Count Palffy, the Austrian governor, to release him (March 17). The Austrians soon lost all control of the city, the arsenal was seized by the revolutionists, and under the direction of Manin a civic guard and a provisional government were instituted. The Austrians evacuated Venice on the 26th of March, and Manin became president of the Venetian republic. He was already in favour of Italian unity, and though not anxious for annexation to Piedmont (he would have preferred to invoke French aid), he gave way to the will of the majority, and resigned his powers to the Piedmontese commissioners on the 7th of August. But after the Piedmontese defeats in Lombardy, and the armistice by which King Charles Albert abandoned Lombardy and Venetia to Austria, the Venetians attempted to lynch the royal commissioners, whose lives Manin saved with difficulty; an assembly was summoned, and a triumvirate formed with Manin at its head. Towards the end of 1848 the Austrians, having been heavily reinforced, reoccupied all the Venetian mainland; but the citizens, hard-pressed and threatened with a siege, showed the greatest devotion to the cause of freedom, all sharing in the dangers and hardships and all giving what they could afford to the state treasury. Early in 1849 Manin was again chosen president of the republic, and conducted the defence of the city with great ability. After the defeat of Charles Albert's forlorn hope at Novara in March the Venetian assembly voted "Resistance at all costs!" and granted Manin unlimited powers. Meanwhile the Austrian forces closed round the city; but Manin showed an astonishing power of organization, in which he was ably seconded by the Neapolitan general, Guglielmo Pepe. But on the 26th of May the Venetians

were forced to abandon Fort Malghera, half-way between the city and the mainland; food was becoming scarce, on the 19th of June the powder magazine blew up, and in July cholera broke out. Then the Austrian batteries began to bombard Venice itself, and when the Sardinian fleet withdrew from the Adriatic the city was also attacked by sea, while certain demagogues caused internal trouble. At last, on the 24th of August 1849, when all provisions and ammunition were exhausted, Manin, who had courted death in vain, succeeded in negotiating an honourable capitulation, on terms of amnesty to all save Manin himself, Pepe and some others, who were to go into exile. On the 27th Manin left Venice for ever on board a French ship. His wife died at Marseilles, and he himself reached Paris broken in health and almost destitute, having spent all his fortune for Venice. In Paris he maintained himself by teaching and became a leader among the Italian exiles. There he became a convert from republicanism to monarchism, being convinced that only under the auspices of King Victor Emmanuel could Italy be freed, and together with Giorgio Pallavicini and Giuseppe La Farina he founded the *Società Nazionale Italiana* with the object of propagating the idea of unity under the Piedmontese monarchy. His last years were embittered by the terrible sufferings of his daughter, who died in 1854, and he himself died on the 22nd of September 1857, and was buried in Ary Scheffer's family tomb. In 1868, two years after the Austrians finally departed from Venice, his remains were brought to his native city and honoured with a public funeral. Manin was a man of the greatest honesty, and possessed genuinely statesmanlike qualities. He believed in Italian unity when most men, even Cavour, regarded it as a vain thing, and his work of propaganda by means of the National Society greatly contributed to the success of the cause.

See A. Errera, *Vita di D. Manin* (Venice, 1872); P. de la Farge, *Documents, &c., de D. Manin* (Paris, 1860); Henri Martin, *D. Manin* (Paris, 1859); V. Marchesi, *Settant' anni della storia di Venezia* (Turin)

and an excellent monograph in Countess Martinengo Cesaresco's *Italian Characters* (London, 1901).

MANING, FREDERICK EDWARD (1812-1883), New Zealand judge and author, son of Frederick Maning, of Johnville, county Dublin, was born on the 5th of July 1812. His father emigrated to Tasmania in the ship "Ardent" in 1824 and took up a grant of land there. Young Maning served in the fatuous expedition which attempted to drive in the Tasmanian blacks by sweeping with an unbroken line of armed men across the island. Soon afterwards he decided to try the life of a trader among the wild tribes of New Zealand, and, landing in the beautiful inlet of Hokianga in 1833, took up his abode among the Ngapuhi. With them the tall Irish lad —he stood 6 ft. 3 in.—full of daring and good-humour and as fond of fun as of fighting, quickly became a prime favourite, was adopted into the tribe, married a chief's daughter, and became a "Pakeha-Maori" (foreigner turned Maori). With the profits of his trading he bought a farm of 200 acres on the Hokianga, for which, unlike most white adventurers of the time, he paid full value. When New Zealand was peacefully annexed in 1840, Maning's advice to the Maori was against the arrangement, but from the moment of annexation he became a loyal friend to the government, and in the wars of 1845-46 his influence was exerted with effect in the settlers' favour. Again, in 1860, he persuaded the Ngapuhi to volunteer to put down the insurrection in Taranaki. Finally, at the end of 1865, he entered the public service as a judge of the native lands court, where his unequalled knowledge of the

Maori language, customs, traditions and prejudices was of solid value. In this office he served until 1881, when ill-health drove him to resign, and two years later to seek surgical aid in London, where, however, he died of cancer on the 25th of July 1883. At his wish, his body was taken back to New Zealand and buried there. A bust of him is placed in the public library at Auckland. Maning is chiefly remembered as the author of two short books, *Old New Zealand and History of the War in the North of New Zealand against the Chief Heké*. Both books were reprinted in London in 1876 and 1884, with an introduction by the earl of Pembroke.

MANIPLE (Lat. *manipulus*, from *manus*, hand, and *plere*, to fill), a liturgical vestment of the Catholic Church, proper to all orders from the subdeacon upwards. It is a narrow strip of material, silk or half-silk, about a yard long, worn on the left fore-arm in such a way that the ends hang down to an equal length on either side. In order to secure it, it is sometimes tied on with strings attached underneath, sometimes provided with a hole in the lining through which the arm is passed. It is ornamented with three crosses, one in the centre and one at each end, that in the centre being obligatory, and is often elaborately embroidered. It is the special ensign of the office of subdeacon, and at the ordination is placed on the arm of the new subdeacon by the bishop with the words: “Take the maniple, the symbol of the fruit of good works.”[1] It is strictly a “mass vestment,” being worn, with certain exceptions (*e.g.* by a subdeacon singing the Gospel at the service of

blessing the palms), only at Mass, by the celebrant and the ministers assisting.

The most common name for the maniple up to the beginning of the 11th century in the Latin Church was *mappula* (dim. of *mappa*, cloth), the Roman name for the vestment until the time of Innocent III. The designation *manipulus* did not come into general use until the 15th century. Father Braun (*Liturg. Gewandung*, p. 517) gives other early medieval names: *sudanum*, *fano*, *mantile*, all of them meaning "cloth" or "handkerchief." He traces the vestment ultimately to a white linen cloth of ceremony (*pallium linostinum*) worn in the 4th century by the Roman clergy over the left arm, and peculiar at that time to them. Its ultimate origin is obscure, but is probably traceable to some ceremonial handkerchiefs commonly carried by Roman dignitaries, *e.g.* those with which the magistrates were wont to signal the opening of the games of the circus. As late as the 9th century, indeed, the maniple was still a handkerchief, held folded in the left hand. By what process it became changed into a narrow strip is not known; the earliest extant specimen of the band-like maniple is that found in the grave of St Cuthbert (9th century); by the 11th century (except in the case of subdeacons, whose maniples would seem to have continued for a while to be cloths in practical use) the maniple had universally assumed its present general form and purely ceremonial character.

The maniple was originally carried in the left hand. In pictures of the 9th, 10th and 11th centuries it is represented as either so carried or as hung over the left fore-arm. By the 12th century the rule according to which it is worn over the left arm had been universally accepted. According to present usage the maniple is put on by priests after the alb and girdle; by deacons and subdeacons after the dalmatic or tunicle; by bishops at the altar after the

Confiteor, except at masses for the dead, when it is assumed before the stole.[2]

In the East the maniple in its Western form is known only to the Armenians, where it is peculiar to subdeacons. This vestment is not derived from the Roman rite, but is properly a stole, which the subdeacons used to carry in the left hand. It is now laid over the subdeacon's left arm at ordination. The true equivalent of the maniple (in the Greek and Armenian rites only) is not, as has been assumed, the *epimanikion*, a sort of loose, embroidered cuff (see VESTMENTS), but the *epigonation*. This is a square of silk, stiffened with cardboard, surrounded by an embroidered border, and usually decorated in the middle with a cross or a sword (the "sword of the Spirit," which it is supposed to symbolize); sometimes, however, the space within the border is embroidered with pictures. It is worn only by bishops and the higher clergy, and derives its name from the fact that it hangs down over the knee (γόνυ). It is worn on the right side, under the *phelonion*, but when the *sakkos* is worn instead of the *phelonion*, by metropolitans, &c., it is attached to this. The *epigonation*, like the maniple, was originally a cloth held in the hand; a fact sufficiently proved by the ancient name ἐγχείριον (χείρ, hand), which it retained until the 12th century. For convenience' sake this cloth came to be suspended from the girdle on the right side, and is thus represented in the earliest extant paintings (see Braun, p. 552). The name *epigonation*, which appears in the latter half of the 12th century, probably marks the date of the complete conventionalizing of the original cloth into the present stiff embroidered square; but the earliest representations of the vestment in its actual form date from the 14th century, *e.g.* the mosaic of St Athanasius in the chapel of St Zeno in St Mark's at Venice.

See J. Braun, S. J., *Die liturgische Gewandung* (Freiburg im Breisgau, 1907), pp. 515-561. and the bibliography to VESTMENTS.

1 According to Father Braun this custom cannot be traced earlier than the 9th century. It forms no essential part of the ordination ceremony (*Liturg. Gewandung*, p. 548).

2 For the evolution of these rules see Braun, *op. cit.* pp. 546 seq.

MANIPUR, a native state on the north-east frontier of India, in political subordination to the lieutenant-governor of Eastern Bengal and Assam. Area, 8456 sq. m. Pop. (1901), 284,465. It is bounded on the N. by the Naga country and the hills overlooking the Assam valley, on the W. by Cachar district, on the E. by Upper Burma, and on the S. by the Lushai hills. The state consists of a wide valley, estimated at about 650 sq. m., and a large surrounding tract of mountainous country. The hill ranges generally run north and south, with occasional connecting spurs and ridges of lower elevation between. Their greatest altitude is in the north, where they reach to upwards of 8000 ft. above sea-level. The principal geographical feature in the valley is the Logtak lake, an irregular sheet of water of considerable size, but said to be yearly growing smaller. The valley is watered by numerous rivers, the Barak being the most important. The hills are densely clothed with tree jungle and large forest timber. Some silk is produced and there are a few primitive manufacturing industries, *e.g.* of pottery. Rice and forest produce, however, are the principal exports. The road from Manipur to the Assam-Bengal railway at Dimapur is the principal trade route.

The kingdom of Manipur, or, as the Burmans call it, Kasse or Kathe, first emerges from obscurity as a neighbour and ally of the Shan kingdom of Pong, which had its capital at Mogaung. The valley appears to have been

originally occupied by several tribes which came from different directions. Although their general facial characteristics are Mongolian, there is a great diversity of feature among the Manipuris, some of them showing a regularity approaching the Aryan type. In the valley the people are chiefly Hindus, that religion being of recent introduction. Their own name for themselves is Meithei, and their language is a branch of the Kuki-Chin family, spoken by 273,000 persons in all India in 1901. One of their peculiarities is the high position enjoyed by women, who conduct most of the trade of the valley. They have a caste system of their own, different from that of India, and chiefly founded on the system of *lallup*, or forced labour, which has been abolished by the British. Every male between the ages of seventeen and sixty was formerly obliged to place his services at the disposal of the state for a certain number of days each year, and to different classes of the people different employments were assigned. About four hundred Mahommedan families, descendants of settlers from Bengal, reside to the east of the capital. The aboriginal hill-men belong to one of the two great divisions of Nagas and Kukis, and are subdivided into innumerable clans and sections with slight differences in language, customs or dress. The state is noted for the excellence of its breed of ponies. The English game of polo was introduced from Manipur, where it forms a great national pastime.

The first relations of the British with Manipur date from 1762, when the raja solicited British aid to repel a Burmese invasion, and a treaty was entered into. The force was recalled, and little communication between the two countries took place until 1824, on the outbreak of the first Burmese War. British assistance was again invoked by the raja, and the Burmese were finally expelled from both the Assam and the Manipur valleys. Disputed successions have always been a cause of trouble. The raja, Chandra Kirtti Singh, died in 1886, and was succeeded by his eldest son, Sur Chandra Singh, who appointed his next brother, Kula Chandra Dhuya Singh, *jubraj*, or heir-apparent. In 1890 another brother, the *senapati*, or

commander-in-chief, Tikendrajit Singh, dethroned the raja, and installed the *jubraj* as regent, the ex-raja retiring to Calcutta. In March 1891 the chief commissioner of Assam (Quinton) marched to Manipur with 400 Gurkhas, in order to settle the question of succession. His purpose was to recognize the new ruler, but to remove the *senapati*. After some futile negotiations, Quinton sent an ultimatum, requiring the surrender of the *senapati*, by the hands of the political resident, F. Grimwood, but no result followed. An attempt was then made to arrest the *senapati*, but after some sharp fighting, in which Lieut. Brackenbury was killed, he escaped; and the Manipuris then attacked the British residency with an overwhelming force. Quinton was compelled to ask for a parley, and he, Colonel Skene, Grimwood, Cossins and Lieut. Simpson, unarmed, went to the fort to negotiate. They were all there treacherously murdered, and when the news arrived the Gurkhas retreated to Cachar, Mrs Grimwood and the wounded being with them. This led to a military expedition, which did not encounter much resistance. The various columns, converging on Manipur, found it deserted; and the regent, *senapati*, and others were captured during May. After a formal trial the *senapati* and one of the generals of the rebellion were hanged and the regent was transported to the Andaman Islands. But it was decided to preserve the existence of the state, and a child of the ruling family, named Chura Chand, of the age of five, was nominated raja. He was sent to be educated in the Mayo College at Ajmere, and he afterwards served for two years in the imperial cadet corps. Meanwhile the administration was conducted under British supervision. The opportunity was seized for abolishing slavery and unpaid forced labour, a land revenue of Rs. 2 per acre being substituted in the valley and a house-tax in the hills. The boundaries of the state were demarcated, disarmament was carried out, and the construction of roads was pushed forward. In 1901 Manipur was visited by Lord Curzon, on his way from Cachar to Burma. In May 1907 the government of the state was handed over to Chura Chand, who was to be assisted by a council of six

Manipuris, with a member of the Indian civil service as vice-president. At the same time it was announced that the government of India would support the raja with all its powers and suppress summarily all attempts to displace him. The revenue is £26,000. The capital is Imphal, which is really an overgrown village; pop. (1901), 67,093.

See Mrs Ethel St Clair Grimwood, *My Three Years in Manipur* (1891); *Manipur State Gazetteer* (Calcutta, 1905); T. C. Hodson, *The Meitheis* (1908).

MANISA (anc. *Magnesia ad Sipylum*), the chief town of the Saru-khan sanjak of the Aidin (Smyrna) vilayet of Asia Minor, situated in the valley of the Gediz Chai (Hermus), at the foot of Mt Sipylus, and connected by railway with Smyrna and Afium Kara-Hissar. Pop. about 35,000, half being Mussulman. Manisa is an important commercial centre, and contains interesting buildings dating from the times of the Seljuk and early Osmanli sultans, including mosques built by Murad II. and III. and a Mevlevi *Tekke* second only to that at Konia. It is the seat of a flourishing American mission. In 1204 Manisa was occupied by John Ducas, who when he became emperor made it the Byzantine seat of government. In 1305, after the inhabitants had massacred the Catalan garrison, Roger de Flor besieged it unsuccessfully. In 1313 the town was taken by Saru Khan and became the capital of the Turcoman emirate of that name. In 1398 it submitted to the Osmanli sultan Bayezid I., and in 1402 was made a treasure city by Timur.

In 1419 it was the scene of the insurrection of the liberal reformer, Bedr ed-Din, which was crushed by Prince Murad, whose residence in the town as Murad II., after twice abdicating the throne, is one of the most romantic stories in Turkish history. In the 17th century Manisa became the residence of the greatest of the Dere Bey families, Kara Osman Oglu, Turcoman by origin, and possibly connected with the former emirs of Sarukhan, which seems to have risen to power by farming the taxes of a province which princes of the house of Othman had often governed and regarded with especial affection. The *liva* of Sarukhan was one of the twenty-two in the Ottoman Empire leased on a life tenure up to the time of Mahmud II. In the 18th century the family of Kara Osman Oglu (or Karasman) ruled *de facto* all west central Anatolia, one member being lord of Bergama and another of Aidin, while the head of the house held Manisa with all the Hermus valley and had greater power in Smyrna than the representative of the capitan pasha in whose province that city nominally lay. Outside their own fiefs the family had so much property that it was commonly said they could sleep in a house of their own at any stage from Smyrna to Baghdad. The last of its great beys was Haji Hussein Zadē, who was frequently called in to Smyrna on the petition of his friends, the European merchants, to assure tranquillity in the troublous times consequent on Napoleon's invasion of Egypt, and the British and Russian attacks on the Porte early in the 19th century. He always acquitted himself well, but having refused to bring his contingent to the grand vizier when on the march to Egypt in 1798, and awakened the jealousy of the capitan pasha, he was in continual danger. Exiled in 1812, he was subsequently restored to Manisa, and died there in 1821. His son succeeded after sanguinary tumults; but Mahmud II., who had long marked the family for destruction, was so hostile towards it, after he had got rid of the janissaries, that it had lost all but the shadow of power by 1830. Descendants survived in Manisa who retained a special right of granting title-deeds within the district, independent of the local administration.

(D. G. H.)

MANISTEE, a city and the county-seat of Manistee county, Michigan, U.S.A., on the Manistee river (which here broadens into a small lake) near its entrance into Lake Michigan, about 114 m. W.N.W. of Grand Rapids. Pop. (1890), 12,812; (1900), 14,260 (4966 foreign-born); (1904, state census), 12,708; (1910), 12,381. It is served by the Père Marquette, the Manistee & Grand Rapids, the Manistee & North-Eastern, and the Manistee & Luther railways, and by steamboat lines to Chicago, Milwaukee and other lake ports. The channel between Lake Manistee and Lake Michigan has been considerably improved since 1867 by the Federal government. There is a United States life-saving station at the harbour entrance. The city has a county normal school, a school for the deaf and dumb, a domestic science and manual training school, a business college, and a Carnegie library. Manistee is a summer resort, with good trout streams and well-known brine-baths. One mile from the city limits, on Lake Michigan, is Orchard Beach, a bathing resort, connected with the city by electric railway; and about 9 m. north of Manistee is Portage Lake (about 2 m. long and 1 m. wide), a fishing resort and harbour of refuge (with a good channel from Lake Michigan), connected with the city by steamboat and railway. Manistee has large lumber interests, is the centre of an extensive fruit-growing region, and has various manufactures, including lumber and salt.[1] The total value of the factory product in 1904 was $3,256,601. The municipality owns and operates its waterworks. Manistee (the name being taken from a former Ottawa Indian village, probably on Little Traverse Bay,

Mich.) was settled about 1849, and was chartered as a city in 1869, the charter of that year being revised in 1890.

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1 There is a very large salt block at Eastlake, 1 m. east of Manistee, and Filer City, a few miles south-east, is another source of supply.

MANITOBA, a lake of Manitoba province, Canada, situated between 50° 11′ and 51° 48′ N. and 97° 56′ and 99° 35′ W. It has an area of 1711 sq. m., a length of shore line of 535 m., and is at an altitude of 810 ft. above the sea. It has a total length of 119 m., a maximum width of 29 m., discharge of 14,833 cub. ft. per second, and has an average depth of 12 ft. Its shores are low, and for the most part swampy. The Waterhen river, which carries the discharge of Lake Winnipegosis, is the only considerable stream entering the lake. It is drained by the Little Saskatchewan river into Lake Winnipeg. It was discovered by De la Verendrye in 1739.

MANITOBA, one of the western provinces of the Dominion of Canada, situated midway between the Atlantic and the Pacific coasts of the

Dominion, about 1090 m. due west of Quebec. It is bounded S. by the parallel 49° N., which divides it from the United States; W. by 101° 20′ W.; N. by 52° 50′ N.; and E. by the western boundary of Ontario. Manitoba formerly belonged to the Hudson's Bay Company, and after the transfer of its territory to Canada was admitted in 1870 as the fifth province of the Dominion. At that time the infant province had an area of 13,500 sq. m., and some 12,000 people, chiefly Indian half-breeds. In 1881 the limits were increased as above, and the province now contains upwards of 73,956 sq. m., extending 264 m. from north to south and upwards of 300 from east to west. The old district of Assiniboia, the result of the efforts in colonization by the earl of Selkirk in 1811 and succeeding years, was the nucleus of the province.

The name Manitoba sprang from the union of two Indian words, *Manito* (the Great Spirit), and *Waba* (the "narrows" of the lake, which may readily be seen on the map). This well-known strait was a sacred place to the Crees and Saulteaux, who, impressed by the weird sound made by the wind as it rushed through the narrows, as simple children of the prairies called them *Manito-Waba*, or the "Great Spirit's narrows." The name, arising from this unusual sound, has been by metonymy translated into "God's Voice." The word was afterwards contracted into its present form. As there is no accent in Indian words, the natural pronunciation of this name would be Mān-ī-tō-bā. On this account, the custom of both the French and English people of the country was for years before and for several years after 1870 to pronounce it Mān-ĭ-tŏ-bā, and even in some cases to spell it "Manitobah." After the formation of the province and the familiar use of the provincial name in the Dominion parliament, where it has occupied much attention for a generation, the pronunciation has changed, so that the province is universally known from ocean to ocean as Mān-ĭ-tō-bă.

Physical Features.—The drainage of Manitoba is entirely north-eastward to Hudson Bay. The three lakes—whose greatest lengths are 260,122 and 119 m. respectively—are Winnipeg, Winnipegosis and Manitoba. They are all of irregular shape, but average respectively 30, 18 and 10 m. in width. They are fresh, shallow and tideless. Winnipegosis and Manitoba at high water, in spring-time, discharge their overflow through small streams into Winnipeg. The chief rivers emptying into Lake Winnipeg are the Winnipeg, the Red and the Saskatchewan. The Assiniboine river enters the Red river 45 m. from Lake Winnipeg, and at the confluence of the rivers ("The Forks") is situated the city of Winnipeg. The Winnipeg, which flows from the territory lying south-east of Lake Winnipeg, is a noble river some 200 m. long, which after leaving Lake of the Woods dashes with its clear water over many cascades, and traverses very beautiful scenery. At its falls from Lake of the Woods is one of the greatest and most easily utilized water-powers in the world, and from falls lower down the river electric power for the city of Winnipeg is obtained. The Red river is at intervals subject to freshets. In a century's experience of the Selkirk colonists there have been four "floods." The highest level of the site of the city of Winnipeg is said to have been under 5 ft. of water for several weeks in May and June in 1826, and 2½ ft. in 1852, not covered in 1861; only the lowest levels were under water in 1882. The extent of overflow has thus on each occasion been less. The loose soil on the banks of the river is every year carried away in great masses, and the channel has so widened as to render the recurrence of an overflow unlikely. The Saskatchewan, though not in the province, empties into Lake Winnipeg less than half a degree from the northern boundary. It is a mighty river, rising in the Rocky Mountains, and crossing eighteen degrees of longitude. Near its mouth are the Grand Rapids. Above these steamers ply to Fort Edmonton, a point upwards

of 800 m. north-west of the city of Winnipeg. Steamers run from Grand Rapids, through Lake Winnipeg, up Red river to the city of Winnipeg, important locks having been constructed on the river at St Andrews.

The surface of Manitoba is somewhat level and monotonous. It is chiefly a prairie region, with treeless plains of from 5 to 40 m. extent, covered in summer with an exuberant vegetable growth, which dies every year. The river banks, however, are fringed with trees, and in the more undulating lands the timber belts vary from a few hundreds of yards to 5 or 10 m. in width, forming at times forests of no inconsiderable size. The chief trees of the country are the aspen (*Populus tremuloides*), the ash-leaved maple (*Negundo aceroides*), oak (*Quercus alba*), elm (*Ulmus Americana*), and many varieties of willow. The strawberry, raspberry, currant, plum, cherry and grape are indigenous.

Climate.—The climate of Manitoba, being that of a region of wide extent and of similar conditions, is not subject to frequent variations. Winter, with cold but clear and bracing weather, usually sets in about the middle of November, and ends with March. In April and May the rivers have opened, the snow has disappeared, and the opportunity has

been afforded the farmer of sowing his grain. June is often wet, but most favourable for the springing crops; July and August are warm, but, excepting two or three days at a time, not uncomfortably so; while the autumn weeks of late August and September are very pleasant. Harvest generally extends from the middle of August to near the end of September. The chief crops of the farmer are wheat (which from its flinty hardness and full kernel is the specialty of the Canadian north-west), oats, barley and pease. Hay is made of the native prairie grasses, which grow luxuriantly. From the richness and mellowness of the soil potatoes and all taproots reach a great size. Heavy dews in summer give the needed moisture after the rains of June have ceased. The traveller and farmer are at times annoyed by the mosquito.

Area and Population.—The area is 73,956 sq. m., of which 64,066 are land and 9890 water. Pop. (1871), 18,995; (1881), 62,260; (1891), 152,506; (1901), 254,947 (138,332 males, 116,615 females); (1906), 365,688 (205,183 males and 160,505 females). The principal cities and towns are: Winnipeg (90,153), Brandon (10,408), Portage la Prairie (5106), St Boniface (5119), West Selkirk (2701), and Morden (1437). In 1901, 49,102 families inhabited 48,415 houses, and the proportion of the urban population to the rural was 27.5 to 72.5. Classified according to place of birth, the principal nationalities were as follows in 1901: Canada, 180,853; England, 20,392; Scotland, 8099; Ireland, 4537; other British possessions, 490; Germany, 2291; Iceland, 5403; Austria, 11,570; Russia and Poland, 8854; Scandinavia, 1772; United States, 6922; other countries, 4028. In 1901 the Indians numbered 5827; half-breeds, 10,372. Of the Indian half-breeds, one half are of English-speaking parentage, and chiefly of Orkney origin; the remainder are known as Metis or Bois-brûlés, and are descended from French-Canadian voyageurs. In 1875 a number of Russian Mennonites (descendants of the Anabaptists of the Reformation) came to the country. They originally emigrated from Germany to the plains of southern Russia,

but came over to Manitoba to escape the conscription. They number upwards of 15,000. About 4000 French Canadians, who had emigrated from Quebec to the United States, have also made the province their home, as well as Icelanders now numbering 20,000. During the decade ending 1907 large reserves were settled with Ruthenians often known as Galicians, Poles and other peoples from central and northern Europe. Some 30,000 of these are found in the province. The remainder of the population is chiefly made up of English-speaking people from the other provinces of the Dominion, from the United States, from England and Scotland and the north of Ireland.

Religion.—Classified according to religion, the various denominations were, in 1901, as follows: Presbyterians, 65,310; Episcopalians, 44,874; Methodists, 49,909; Roman Catholics, 35,622; Baptists, 9098; Lutherans, 16,473; Mennonites, 15,222; Greek Catholics, 7898; other denominations, 9903; not specified, 638.

Government.—The province is under a lieutenant-governor, appointed for a term of five years, with an executive council of six members, responsible to the local legislature, which consists of forty-two members. It has four members in the Canadian Senate and ten in the House of Commons.

Education.—The dual system of education, established in 1871, was abolished in 1890, and the administrative machinery consolidated under a minister of the Crown and an advisory board. This act was amended in 1897 to meet the wishes of the Roman Catholic minority, but separate schools were not re-established; nor was the council divided into denominational committees. There are collegiate institutes for more advanced education at Winnipeg, Brandon and Portage la Prairie, with a total of 1094 pupils enrolled. There is also a normal school at Winnipeg for the training of teachers. Higher education is represented by the provincial university, which teaches science and mathematics, holds examinations, distributes

scholarships, and grants degrees in all subjects. It has affiliated to it colleges of the Roman Catholic, Episcopalian, Presbyterian and Methodist denominations, with medical and pharmaceutical colleges. The arts colleges of the churches carry on the several courses required by the university, and send their students to the examinations of the university. A well-equipped agricultural college near Winnipeg is provided for sons and daughters of farmers.

Agriculture is the prevailing industry of Manitoba. Dairy-farming is rapidly increasing in importance, and creameries for the manufacture of butter and cheese are established in almost all parts of the province. Large numbers of horses, cattle, swine and poultry are reared. The growth of cereals is the largest department of agriculture followed.

The following statistics are interesting:—

	1883.	1890.	1894.	1901.
	Bushels.	Bushels.	Bushels.	Bushels.
Wheat	5,686,355	14,665,769	17,172,883	50,502,085
Oats	9,478,965	9,513,443	11,907,854	27,796,588
Barley	1,898,430	2,069,415	2,981,716	6,536,155
Flax	No statistics collected		366,000	266,420
Rye	”	”	59,924	62,261
Peas	”	”	18,434	16,349
Potatoes	”	”	2,035,336	4,797,433
Other roots	”	”	1,841,942	2,925,362

The enormous development of the wheat-growing industry is shown by these and the following statistics:—

Wheat inspected in Winnipeg.		
1902	51,833,000	bushels
1903	40,396,650	”
1904	39,784,900	”
1905	55,849,840	”
1906	66,636,390	”

These figures do not include the wheat ground into flour and sent by way of British Columbia to Asia and Australia, nor the wheat retained by the farmers for seed. The Dominion government maintains an experimental farm of 670 acres at Brandon. The fisheries are all fresh-water, principally white-fish, pickerel and pike. Large quantities of fresh fish caught in lakes Winnipeg and Manitoba are exported to all parts of the United States.

Communications.—The region of the Red River and Assiniboine valleys was opened up by the fur traders, who came by the waterways from Lake Superior, and afterwards by the water communication with Hudson Bay. While these early traders used the canoe and the York boat,[1] yet the steamboat played an important part in the early history of the region from 1868 till 1885, when access from the United States was gained by steamers down the Red River. The completion of the St Andrew’s Rapids canal on Red River, and the Grand Rapids canal on the Saskatchewan river will again give an impetus to inland navigation on the tributaries of Lake Winnipeg. Lake Manitoba also affords opportunity for inland shipping.

The broad expanse of prairie-land in the western provinces of Canada is well suited for the cheap and expeditious building of railways. The first connexion with the United States was by two railways coming down the Red River valley. But the desire for

Canadian unity led the Dominion to assist a transcontinental line connecting Manitoba with eastern Canada. The building of the Canadian Pacific railway through almost continuous rocks for 800 miles was one of the greatest engineering feats of modern times. Immediately on the formation of the Canadian Pacific railway company branch lines were begun at Winnipeg and there are eight radial lines running from this centre to all parts of the country. Winnipeg is thus connected with Montreal on the east, and Vancouver on the west, and is the central point of the Canadian Pacific system, having railway yards and equipment equalled by few places in America. In opposition to the Canadian Pacific railway a southern line was built from Winnipeg to the American boundary. This fell into the hands of the Northern Pacific railway, but was purchased by the promoters of the Canadian Northern railway. This railway has six radiating lines leaving the city of Winnipeg, and its main line connects Port Arthur on Lake Superior with Edmonton in the west. The Canadian Northern railway has a remarkable network of railways connecting Winnipeg with every corner of Manitoba. The Great Northern railway has also three branch lines in Manitoba and one of these has Winnipeg as its terminus. The grand Trunk Pacific railway, the great transcontinental line promoted by the Laurier government, passes through Manitoba north of the Canadian Pacific, coming from the east deflects southward to pass through Winnipeg, and then strikes northward in a direct line of easy gradients to find its way through the Rocky Mountains to its terminus of Prince Rupert on the north coast of British Columbia.

History.—The first white settlement in Manitoba was made by Pierre Gaultier de Varennes, Sieur de la Verendrye (d. 1749), who, gradually pushing westward from Lake Superior, reached Lake Winnipeg in 1733, and in the following year built a fort not far from the present Fort

Alexander. In October 1738 he built another at Fort Rouge, at the junction of the Red and Assiniboine rivers, where is now the city of Winnipeg. After the British conquest of 1763 the west became the scene of a rapidly increasing fur trade, and for many years there was keen rivalry between the Hudson's Bay Company, with its headquarters in England, and the North-West Company of Montreal. French and Scottish farmers and fur-traders gradually settled along the Red River, and by their frequent marriages with the Indians produced a race of metis or half-breeds. From 1811 to 1818 Lord Selkirk's attempted colonization greatly increased the population; from the time of his failure till 1869 the settlers lived quietly under the mild rule of the Hudson's Bay Company. In that year the newly formed Dominion of Canada bought from the company its territorial and political rights. A too hasty occupation by Canadian officials and settlers led to the rebellion of the Metis under Louis Riel, a native leader. The rebellion was quieted and Sir Garnet Wolseley (now Lord Wolseley) was sent from Canada by the lake route, with several regiments of troops—regulars and volunteers. The Manitoba Act constituting the province was passed by the Canadian parliament in 1870. (See RED RIVER SETTLEMENT; and RIEL, LOUIS.)

The admixture of races and religions, and its position as the key to the great West, have ever since made Manitoba the storm centre of Canadian politics. In the charter granted by the Canadian parliament to the Canadian Pacific railway a clause giving it for twenty years control over the railway construction of the province led to a fierce agitation, till the clause was repealed in 1888. Till 1884 an equally fierce agitation was carried on against Ontario with regard to the eastern boundary of Manitoba. (See ONTARIO.) In both these disputes the provincial leader was the Hon. John Norquay, in whose veins ran a large admixture of Indian blood. In 1890 changes in the school system unfavourable to the Roman Catholic Church led to a constitutional struggle, to which was due the defeat of the Federal

ministry in 1896. Since 1896 its rapid material progress has produced numerous economic problems and disputes, many of which are still unsolved.

(G. Br.; W. L. G.)

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1 A round-bottomed, strongly built boat, 30 to 36 ft. long, propelled by 8 men. It was devised by the Hudson's Bay Company for carrying freight, as a substitute for the less serviceable canoe, and was named after their York factory, the centre to which the traders brought down the furs for shipment to England and from which they took back merchandise and supplies to the interior of Rupert's Land.

MANITOU or Manito (Algonquian Indian, "mystery," "supernatural"), among certain American Indian tribes, a spirit or genius of good or evil. The manitou is almost always an animal, each individual having one assigned him, generally by dream-inspiration, at the greatest religious act of his life—his first fast. This animal then becomes his fetish; its skin is carried as a charm, and representations of it are tattooed and painted on the body or engraved on the weapons.

MANITOWOC (Indian, “Spirit-land”), a city and the county-seat of Manitowoc county, Wisconsin, on the W. shore of Lake Michigan, 75 m. N. of Milwaukee. Pop. (1890), 7710; (1900), 11,786, of whom 2998 were foreign-born; (1910 census), 13,027. It is served by the Chicago & North-Western, and the Wisconsin Central railways; by ferry across the lake to Frankfort, Mich., and Ludington, Mich.; by the Ann Arbor and the Père Marquette railways; and by the Goodrich line of lake steamers. The city is finely situated on high ground above the lake at the mouth of the Manitowoc river. At Manitowoc are the county insane asylum and a Polish orphan asylum. The city has a training school for county teachers, a business college, two hospitals and a Carnegie library. There are ship-yards for the construction of both steel and wooden vessels, and several grain elevators. The value of the factory products increased from $1,935,442 in 1900 to $4,427,816 in 1905, or 128.8 per cent.—a greater increase than that of any other city in the state during this period. There is a good harbour, and the city has a considerable lake commerce in grain, flour, and dairy products. Jacques Vieau established here a post for the North-west Company of fur traders in 1795. The first permanent settlement was made about 1836, and Manitowoc was chartered as a city in 1870. In Manitowoc county, 18 m. south-west of the city of Manitowoc, is St Nazianz, an unorganized village near which in 1854 a colony or community of German Roman Catholics was established under the leadership of Father Ambrose Oswald, the primary object being to enable poor people by combination and co-operation to supply themselves with the comforts of life at minimum expense and have as much time as possible left for religious thought and worship. The title of the colony’s land was vested in Father Oswald after the panic of 1857 until his death in 1874, when he devised the lands to “the colony founded by me.” The colony had no legal existence at the time, but was then incorporated as the “Roman Catholic Religious Society of St Nazianz,” and as such sued successfully for the bequest. Financially the

colony was successful, but as there were some desertions and no new recruits after Father Oswald's death, there were few members by 1909. There are no longer any traces of communism, and the colony's property is actually held by an organization of the local Roman Catholic church.

MANIZALES, a city of Colombia and capital of the department of Cáldas (up to 1905 the northern part of Antioquia), 75 m. S. of Medellin, on the old trade route across the Cordillera between Honda, on the Magdalena, and the Cauca Valley. Pop. (1906, estimate), 20,000. The city is situated on a plateau of the western slope of the Cordillera, 6988 ft. above the sea. It is surrounded by rich mineral and agricultural districts.

MANKATO, a city and the county-seat of Blue Earth county, Minnesota, U.S.A., at the southern bend of the Minnesota river, where it is joined by the Blue Earth about 86 m. S.W. of Minneapolis. Pop. (1890), 8838; (1900), 10,599, of whom 2578 were foreign-born; (1910 census), 10,365. Mankato is served by the Chicago, St. Paul, Minneapolis & Omaha,

the Chicago & North-Western (both “North-Western Lines”), the Chicago, Milwaukee & St Paul, and the Chicago Great-Western railways. The city has two fine parks, a Carnegie library, a Federal building, the Immanuel and St Joseph hospitals, two commercial colleges, and a state normal school (1868). The numerous lakes in the neighbourhood, particularly Lake Madison and Lake Washington, are widely known as summer resorts. Four miles west of the city is Minneopa state park (area, 60 acres), in which are Minneopa Falls (60 ft.) and a fine gorge; the park was established by the state in 1905-1906. Mankato has an extensive trade in dairy and agricultural products (especially grain), stone (a pinkish buff limestone is quarried in the vicinity), and forest products. The value of its factory products increased from $1,887,315 in 1900 to $3,422,117 in 1905, or 81.3%.

Mankato was settled about 1853, and was first chartered as a city in 1868. On or near the site of the city stood a village of the Mankato (“blue earth”) band of the Mdewakanton Sioux, who derived their name from one of their chiefs, “Old Mankato.” In this region occurred the Sioux uprising of 1862, and from this point operations were carried on which eventually resulted in the subjugation of the Indians and the hanging, at Mankato, in December 1862, of 38 leaders of the revolt. In the uprising the Mankato band was led by another chief named Mankato, who took part in the attack on Ft Ridgeley, Minn., in August, in the engagement on the 3rd of September at Birch Coolie, Minn., and in that on the 23rd of September at Wood Lake, where he was killed.

MANLEY, MARY DE LA RIVIERE (*c.* 1663-1724), English writer, daughter of Sir Roger Manley, governor of the Channel Islands, was born on the 7th of April 1663 in Jersey. She wrote her own biography under the title of *The Adventures of Rivella, or the History of the Author of the Atalantis* by "Sir Charles Lovemore" (1714). According to her own account she was left an orphan at the age of sixteen, and beguiled into a mock marriage with a kinsman who deserted her basely three years afterwards. She was patronized for a short time by the duchess of Cleveland, and wrote an unsuccessful comedy, *The Lost Lover* (1696); in freedom of speech she equalled the most licentious writers of comedy in that generation. Her tragedy, *The Royal Mischief* (1696) was more successful. From 1696 Mrs Manley was a favourite member of witty and fashionable society. In 1705 appeared *The Secret History of Queen Zarah and the Zarazians*, a satire on Sarah, duchess of Marlborough, in the guise of romance. This was probably by Mrs Manley, who, four years later, achieved her principal triumph as a writer by her *Secret Memoirs ... of Several Persons of Quality* (1709), a scandalous chronicle "from the New Atalantis, an island in the Mediterranean." She was arrested in the autumn of 1709 as the author of a libellous publication, but was discharged by the court of queen's bench on the 13th of February 1710. Mrs Manley sought in this scandalous narrative to expose the private vices of the ministers whom Swift, Bolingbroke and Harley combined to drive from office. During the keen political campaign in 1711 she wrote several pamphlets, and many numbers of the *Examiner*, criticizing persons and policy with equal vivacity. Later were published her tragedy *Lucius* (1717); *The Power of Love, in Seven Novels* (1720), and *A Stage Coach Journey to Exeter* (1725).

MANLIUS, the name of a Roman gens, chiefly patrician, but containing plebeian families also.

1. Marcus Manlius Capitolinus, a patrician, consul 392 B.C. According to tradition, when in 390 B.C. the besieging Gauls were attempting to scale the Capitol, he was roused by the cackling of the sacred geese, rushed to the spot and threw down the foremost assailants (Livy v. 47; Plutarch, *Camillus*, 27). Several years after, seeing a centurion led to prison for debt, he freed him with his own money, and even sold his estate to relieve other poor debtors, while he accused the senate of embezzling public money. He was charged with aspiring to kingly power, and condemned by the comitia, but not until the assembly had adjourned to a place without the walls, where they could no longer see the Capitol which he had saved. His house on the Capitol (the origin of his surname) was razed, and the Manlii resolved that henceforth no patrician Manlius should bear the name of Marcus. According to Mommsen, the story of the saving of the Capitol was a later invention to explain his surname, and his attempt to relieve the debtors a fiction of the times of Cinna.

Livy vi. 14-20; Plutarch, *Camillus*, 36; Cicero, *De domo*, 38.

2. Titus Manlius Imperiosus Torquatus, twice dictator (353, 349 B.C.) and three times consul (347, 344, 340). When his father, L. Manlius Imperiosus (dictator 363), was brought to trial by the tribune M. Pomponius for abusing his office of dictator, he forced Pomponius to drop the

accusation by threatening his life (Livy vii. 3-5). In 360, during a war with the Gauls, he slew one of the enemy, a man of gigantic stature, in single combat, and took from him a torques (neck-ornament), whence his surname. When the Latins demanded an equal share in the government of the confederacy, Manlius vowed to kill with his own hand the first Latin he saw in the senate-house. The Latins and Campanians revolted, and Manlius, consul for the third time, marched into Campania and gained two great victories, near Vesuvius, where P. Decius Mus (*q.v.*), his colleague, "devoted" himself in order to gain the day, and at Trifanum. In this campaign Manlius executed his own son, who had killed an enemy in single combat, and thus disobeyed the express command of the consuls.

Livy vii. 4, 10, 27, viii. 3; Cicero, *De off.* iii. 31.

3. Titus Manlius Torquatus, consul 235 B.C. and 224, censor 231, dictator 208. In his first consulship he subjugated Sardinia, recently acquired from the Carthaginians, when the temple of Janus was shut for the second time in Roman history (Livy i. 19). In 216 he opposed the ransoming of the Romans taken prisoners at Cannae; and in 215 he was sent to Sardinia and defeated a Carthaginian attempt to regain possession of the island.

Livy xxiii. 34; Polybius ii. 31.

4. Gnaeus Manlius Vulso, praetor 195, consul 189. He was sent to Asia to conclude peace with Antiochus III., king of Syria. He marched into Pamphylia, defeated the Celts of Galatia on Mt Olympus and drove them back across the Halys. In the winter, assisted by ten delegates sent from Rome, he settled the terms of peace with Antiochus, and in 187 received the honour of a triumph.

Polybius xxii. 16-25; Livy xxxviii. 12-28, 37-50; xxxix. 6.

MANN, HORACE (1796-1859), American educationist, was born in Franklin, Massachusetts, on the 4th of May 1796. His childhood and youth were passed in poverty, and his health was early impaired by hard manual labour. His only means for gratifying his eager desire for books was the small library founded in his native town by Benjamin Franklin and consisting principally of histories and treatises on theology. At the age of twenty he was fitted, in six months, for college, and in 1819, graduated with highest honours, from the Brown University at Providence, Rhode Island, having devoted himself so unremittingly to his studies as to weaken further his naturally feeble constitution. He then studied law for a short time at Wrentham, Massachusetts; was tutor in Latin and Greek (1820-1822) and librarian (1821-1823) at Brown University; studied during 1821-1823 in the famous law school conducted by Judge James Gould at Litchfield, Connecticut; and in 1823 was admitted to the Norfolk (Mass.) bar. For fourteen years, first at Dedham, Massachusetts, and after 1833 at Boston, he devoted himself, with great success, to his profession. Meanwhile he served, with conspicuous ability, in the Massachusetts House of Representatives from 1827 to 1833 and in the Massachusetts Senate from 1833 to 1837, for the last two years as president. It was not until he became secretary (1837) of the newly created board of education of Massachusetts, that he began the work which was soon to place him in the foremost rank of American educationists. He held this position till 1848, and worked with a remarkable intensity—holding teachers' conventions, delivering numerous

lectures and addresses, carrying on an extensive correspondence, introducing numerous reforms, planning and inaugurating the Massachusetts normal school system, founding and editing *The Common School Journal* (1838), and preparing a series of *Annual Reports*, which had a wide circulation and are still considered as being "among the best expositions, if, indeed, they are not the very best ones, of the practical benefits of a common school education both to the individual and to the state" (Hinsdale). The practical result of his work was the virtual revolutionizing of the common school system of Massachusetts, and indirectly of the common school systems of other states. In carrying out his work he met with bitter opposition, being attacked particularly by certain school-masters of Boston who strongly disapproved of his pedagogical theories and innovations, and by various religious sectaries, who contended against the exclusion of all sectarian instruction from the schools. He answered these attacks in kind, sometimes perhaps with unnecessary vehemence and rancour, but he never faltered in his work, and, an optimist by nature, a disciple of his friend George Combe (*q.v.*), and a believer in the indefinite improvability of mankind, he was sustained throughout by his conviction that nothing could so much benefit the race, morally, intellectually and materially, as education. Resigning the secretaryship in 1848, he was elected to the national House of Representatives, as an anti-slavery Whig to succeed John Quincy Adams, and was re-elected in 1849, and, as an independent candidate, in 1850, serving until March 1853. In 1852 he was the candidate of the Free-soilers for the governorship of Massachusetts, but was defeated. In Congress he was one of the ablest opponents of slavery, contending particularly against the Compromise Measures of 1850, but he was never technically an Abolitionist and he disapproved of the Radicalism of Garrison and his followers. From 1853 until his death, on the second of August 1859, he was president of the newly established Antioch College at Yellow Springs, Ohio, where he taught

political economy, intellectual and moral philosophy, and natural theology. The college received insufficient financial support and suffered from the attacks of religious sectaries—he himself was charged with insincerity because, previously a Unitarian, he joined the Christian Connexion, by which the college was founded—but he earned the love of his students, and by his many addresses exerted a beneficial influence upon education in the Middle West.

A collected edition of Mann's writings, together with a memoir (1 vol.) by his second wife, Mary Peabody Mann, a sister of Miss E. P. Peabody, was published (in 5 vols. at Boston in 1867-1891) as the *Life and Works of Horace Mann*. Of subsequent biographies the best is probably Burke A. Hinsdale's *Horace Mann and the Common School Revival in the United Stales* (New York, 1898), in "The Great Educators" series. Among other biographies O. H. Lang's *Horace Mann, his Life and Work* (New York, 1893), Albert E. Winship's *Horace Mann, the Educator* (Boston, 1896), and George A. Hubbell's *Life of Horace Mann, Educator, Patriot and Reformer* (Philadelphia, 1910), may be mentioned. In vol. I. of the *Report* for 1895-1896 of the United States commissioner of education there is a detailed "Bibliography of Horace Mann," containing more than 700 titles.

MANNA, a concrete saccharine exudation obtained by making incisions on the trunk of the flowering or manna ash tree, *Fraxinus Ornus*.

The manna ash is a small tree found in Italy, and extending to Switzerland, South Tirol, Hungary, Greece, Turkey and Asia Minor. It also grows in the islands of Sicily, Corsica and Sardinia. It blossoms early in summer, producing numerous clusters of whitish flowers. At the present day the manna of commerce is collected exclusively in Sicily from cultivated trees, chiefly in the districts around Capaci, Carini, Cinisi and Favarota, small towns 20 to 25 m. W. of Palermo, and in the townships of Geraci, Castelbuono, and other places in the district of Cefalù, 50 to 70 m. E. of Palermo. In the *frassinetti* or plantations the trees are placed about 7 ft. apart, and after they are eight years old, and the trunk at least 3 in. in diameter, the collection of manna is begun. This operation is performed in July or August during the dry weather, by making transverse incisions 1½ to 2 in. long, and about 1 in. apart, through the bark, one cut being made each day, the first at the bottom of the tree, another directly above the first, and so on. In succeeding years the process is repeated on the untouched sides of the trunk, until the tree has been cut all round and exhausted. It is then cut down, and a young plant arising from the same root takes its place. The finest or flaky manna appears to have been allowed to harden on the stem. A very superior kind, obtained by allowing the juice to encrust pieces of wood or straws inserted in the cuts, is called *manna a cannolo*. The fragments adhering to the stem, after the finest flakes have been removed are scraped off, and form the small or Tolfa manna of commerce. That which flows from the lower incisions is often collected on tiles or on a concave piece of the prickly pear (*Opunlia*), but is less crystalline and more glutinous, and is less esteemed.

Manna of good quality dissolves at ordinary temperatures in about 6 parts of water, forming a clear liquid. Its chief constituent is mannite or manna sugar, a hexatomic alcohol, $C_6H_8(OH)_6$, which likewise occurs, in much smaller quantity, in certain species of the brown seaweed, *Fucus*, and in plants of several widely separated natural orders. Mannite is obtained by

extracting manna with alcohol and crystallizing the solution. The best manna contains 70 to 80%. It crystallizes in shining rhombic prisms from its aqueous solution and as delicate needles from alcohol. Manna possesses mildly laxative properties, and on account of its sweet taste is employed as a mild aperient for children. It is less used in England now than formerly, but is still largely consumed in South America. In Italy mannite is prepared for sale in the shape of small cones resembling loaf sugar in shape, and is frequently prescribed in medicine instead of manna.

The manna of the present day appears to have been unknown before the 15th century, although a mountain in Sicily with the Arabic name Gibelman, *i.e.* "manna mountain," appears to point to its collection there during the period that the island was held by the Saracens, 827-1070. In the 16th century it was collected in Calabria, and until recently was produced in the Tuscan Maremma, but none is now brought into commerce from Italy, although the name of Tolfa, a town near Civita Vecchia, is still applied to an inferior variety of the drug.

Various other kinds of manna are known, but none of these has been found to contain mannite. Alhagi manna (Persian and Arabic *tar-angubīn*, also known as terendschabin) is the produce of *Alhagi maurorum*, a small, spiny, leguminous plant, growing in Arabia, Asia Minor, Persia, Afghanistan, Baluchistan and northern India. This manna occurs in the form of small, roundish, hard, dry tears, varying from the size of a mustard seed to that of a coriander, of a light-brown colour, sweet taste, and senna-like odour. The spines and pods of the plant are often mixed with it. It is collected near Kandahar and Herat, and imported into India from Cabul and Kandahar. Tamarisk manna (Persian *gaz-angubīn*, tamarisk honey) exudes in June and July from the slender branches of *Tamarix gallica*, var. *mannifera*, in the form of honey-like drops, which, in the cold temperature of the early morning,

are found in the solid state. This secretion is caused by the puncture of an insect, *Coccus manniparus*. In the valleys of the peninsula of Sinai, especially in the Wādy el-Sheikh, this manna (Arabic *man*) is collected by the Arabs and sold to the monks of St Catherine, who supply it to the pilgrims visiting the convent. It is found also in Persia and the Punjab, but does not appear to be collected in any quantity. This kind of manna seems to be alluded to by Herodotus (vii. 31). Under the same name of *gaz-angubīn* there are sold commonly in the Persian bazaars round cakes, of which a chief ingredient is a manna obtained to the south-west of Ispahan, in the month of August, by shaking the branches or scraping the stems of *Astragalus florulentus* and *A. adscendens*.[1] *Shir Khist*, a manna known to writers on materia medica in the 16th century, is imported into India from Afghanistan and Turkestan to a limited extent; it is the produce of *Cotoneaster nummularia* (*Rosaceae*), and to a less extent of *Atraphaxis spinosa* (*Polygonaceae*); it is brought chiefly from Herat.

Oak manna or *Gueze-elefi*, according to Haussknecht, is collected from the twigs of *Quercus Vallonia* and *Q. persica*, on which it is produced by the puncture of an insect during the month of August. This manna occurs in the state of agglutinated tears, and forms an object of some industry among the wandering tribes of Kurdistan. It is collected before sunrise, by shaking the grains of manna on to linen cloths spread out beneath the trees, or by dipping the small branches in hot water and evaporating the solution thus obtained. A substance collected by the inhabitants of Laristan from *Pyrus glabra* strongly resembles oak manna in appearance.

Australian or Eucalyptus manna is found on the leaves of *Eucalyptus viminalis*, *E. Gunnii*, var. *rubida*, *E. pulverulenta*, &c. The Lerp manna of Australia is of animal origin.

Briançon manna is met with on the leaves of the common Larch (*q.v.*), and *bide-khecht* on those of the willow, *Salix fragilis*; and a kind of manna was at one time obtained from the cedar.

The manna of the Biblical narrative, notwithstanding the miraculous circumstances which distinguish it from anything now known, answers in its description very closely to the tamarisk manna.

See Bentley and Trimen, *Medicinal Plants* (1880); Watt, *Dictionary of Economic Products of India*, under "Manna" (1891). For analyses see A. Ebert, *Abst. J.C.S.*, 1909, 96, p. 176.

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1 See *Bombay Lit. Tr.*, vol. i. art. 16, for details as to the *gazangubīn*. A common Persian sweetmeat consists of wheat-flour kneaded with manna into a thick paste.

MANNERS, CHARLES (1857-), English musician, whose real name was Southcote Mansergh, was born in London, son of Colonel Mansergh, an Irishman. He had a fine bass voice, and was educated for the musical profession in Dublin and at the Royal Academy of Music in London. He began singing in opera in 1881, and in 1882 had great success as the sentry in *Iolanthe* at the Savoy, following this with numerous engagements in opera both in England and America. He married the singer Fanny Moody, already a leading soprano on the operatic stage, in 1890; and in 1897 they formed the Moody-Manners opera company, which had a great success in the provinces and undertook seasons in London in 1902.

Manners and his wife were assisted by some other excellent artists, and their enterprise had considerable influence on contemporary English music.

MANNERS-SUTTON, CHARLES

(1755-1828), archbishop of Canterbury, was educated at Charterhouse and Cambridge. In 1785 he was appointed to the family living at Averham-with-Kelham, in Nottinghamshire, and in 1791 became dean of Peterborough. He was consecrated bishop of Norwich in 1792, and two years later received the appointment of dean of Windsor *in commendam*. In 1805 he was chosen to succeed Archbishop Moore in the see of Canterbury. During his primacy the old archiepiscopal palace at Croydon was sold and the country palace of Addington bought with the proceeds. He presided over the first meeting which issued in the foundation of the National Society, and subsequently lent the scheme his strong support. He also exerted himself to promote the establishment of the Indian episcopate. His only published works are two sermons, one preached before the Lords (London, 1794), the other before the Society for the Propagation of the Gospel (London, 1797). His brother, THOMAS MANNERS-SUTTON, 1st BARON MANNERS (1756-1842), was lord chancellor of Ireland. For his son Charles see CANTERBURY, 1ST VISCOUNT.

MANNHEIM, a town of Germany, in the grand-duchy of Baden, lying on the right bank of the Rhine, at its confluence with the Neckar, 39 m. by rail N. of Karlsruhe, 10 m. W. of Heidelberg and 55 m. S. of Frankfort-on-Main. Pop. (1900), 141,131; (1905), 162,607 (of whom about 70,000 are Roman Catholics and 6000 Jews). It is perhaps the most regularly built town in Germany, consisting of twelve parallel streets intersected at right angles by others, which cut it up into 136 square sections of equal size. These blocks are distinguished, after the American fashion, by letters and numerals. Except on the south side all the streets debouch on the promenade, which forms a circle round the town on the site of the old ramparts. Outside this ring are the suburbs Schwetzinger-Vorstadt to the south and Neckar-Vorstadt to the north, others being Lindenhof, Mühlau, Neckarau and Käferthal. Mannheim is connected by a handsome bridge with Ludwigshafen, a rapidly growing commercial and manufacturing town on the left bank of the Rhine, in Bavarian territory. The Neckar is spanned by two bridges.

Nearly the whole of the south-west side of the town is occupied by the palace (1720-1759), formerly the residence of the elector palatine of the Rhine. It is one of the largest buildings of the kind in Germany, covering an area of 15 acres, and having a frontage of about 600 yards. It has 1500 windows. The left wing was totally destroyed by the bombardment of 1795, but has since been restored. The palace contains a picture gallery and collections of natural history and antiquities, and in front of it are two

monumental fountains and a monument to the emperor William I. The large and beautiful gardens at the back form the public park of the town. Among the other prominent buildings arc the theatre, the arsenal, the synagogue, the "Kaufhaus," the town-hall (*Rathaus*, 1771) and the observatory. A newer building is the fine municipal Festhalle with magnificent rooms. The only noteworthy churches are the Jesuit church (1737-1760), the interior of which is lavishly decorated with marble and painting; the Koncordienkirche and the Schlosskirche. In front of the theatre are statues of Schiller, August Wilhelm Iffland the actor, and Wolfgang Heribert von Dalberg (1750-1806), intendant of the theatre in the time of Schiller. Mannheim is the chief commercial town on the upper Rhine, and yields in importance to Cologne alone among the lower Rhenish towns. It stands at the head of the effective navigation on the Rhine, and is not only the largest port on the upper course of that stream, but is the principal emporium for south Germany for such commodities as cereals, coal, petroleum, timber, sugar and tobacco, with a large trade in hops, wine and other south German produce. Owing to the rapid increase in the traffic, a new harbour at the mouth of the Neckar was opened in 1898. The industries are equal in importance to the transit trade, and embrace metal-working, iron-founding and machine building, the manufacture of electric plant, celluloid, automobiles, furniture, cables and chemicals, sugar refining, cigar and tobacco making, and brewing.

Mannheim is the seat of the central board for the navigation of the Rhine, of a high court of justice, and of the grand ducal commissioner for north Baden.

History.—The name of Mannheim was connected with its present site in the 8th century, when a small village belonging to the abbey of Lorsch lay in the marshy district between the Neckar and the Rhine. To the south of this village, on the Rhine, was the castle of Eicholzheim, which acquired some celebrity as the place of confinement assigned to Pope John XXIII. by

the council of Constance. The history of modern Mannheim begins, however, with the opening of the 17th century, when the elector palatine Frederick IV. founded a town here, which was peopled chiefly with Protestant refugees from Holland. The strongly fortified castle which he erected at the same time had the unfortunate result of making the infant town an object of contention in the Thirty Years' War, during which it was five times taken and retaken. In 1688 Mannheim, which had in the meantime recovered from its former disasters, was captured by the French, and in 1689 it was burned down. Ten years later it was rebuilt on an extended scale, and provided with fortifications by the elector John William. For its subsequent importance it was indebted to the elector Charles Philip, who, owing to ecclesiastical disputes, transferred his residence from Heidelberg to Mannheim in 1720. It remained the capital of the Palatinate for nearly sixty years, being especially flourishing under the elector Charles Theodore. In 1794 Mannheim fell into the hands of the French, and in the following year it was retaken by the Austrians after a severe bombardment, which left scarcely a single building uninjured. In 1803 it was assigned to the grand duke of Baden, who caused the fortifications to be razed. Towards the end of the 18th century Mannheim attained great celebrity in the literary world as the place where Schiller's early plays were performed for the first time. It was at Mannheim that Kotzebue was assassinated in 1819. During the revolution in Baden in 1849 the town was for a time in the hands of the insurgents, and was afterwards occupied by the Prussians.

See Feder, *Geschichte der Stadt Mannheim* (1875-1877, 2 vols., new ed. 1903); Pichler, *Chronik des Hof- und National Theaters in Mannheim* (Mannheim, 1879); Landgraf, *Mannheim und Ludwigshafen* (Zürich, 1890); *Die wirtschaftliche Bedeutung Mannheims*, published by the Mannheim Chamber of Commerce (Mannheim, 1905); the *Forschungen zur Geschichte Mannheims und der Pfalz*, published by

the *Mannheimer Altertumsverein* (Leipzig, 1898); and the annual *Chronik der Hauptstadt Mannheim* (1901 seq.).

MANNING, HENRY EDWARD (1808-1892), English Roman Catholic cardinal, was born at Totteridge, Hertfordshire, on the 15th of July 1808,[1] being the third and youngest son of William Manning, a West India merchant, who was a director of the Bank of England and governor, 1812-1813, and who sat in Parliament for some thirty years, representing in the Tory interest Plympton Earle, Lymington, Evesham, and Penryn consecutively. His mother, Mary, daughter of Henry Leroy Hunter, of Beech Hill, Reading, was of a family said to be of French extraction. Manning's boyhood was mainly spent at Coombe Bank, Sundridge, Kent, where he had for companions Charles and Christopher Wordsworth, afterwards bishops of St Andrews and of Lincoln. He was educated at Harrow, 1822-1827, Dr G. Butler being then the head master, but obtained no distinction beyond being in the cricket eleven in 1825. He matriculated at Balliol College, Oxford, in 1827, and soon made his mark as a debater at the Union, where Gladstone succeeded him as president in 1830. At this date he was ambitious of a political career, but his father had sustained severe losses in business, and in these circumstances Manning, having graduated with first-class honours in 1830, obtained the year following, through Viscount Goderich, a post as supernumerary clerk in the colonial office. This, however, he resigned in 1832, his thoughts having been turned towards a clerical career under Evangelical influences, which affected him

deeply throughout life. Returning to Oxford, he was elected a fellow of Merton College, and was ordained; and in 1833 he was presented to the rectory of Lavington-with-Graffham in Sussex by Mrs Sargent, whose granddaughter Caroline he married on the 7th of November 1833, the ceremony being performed by the bride's brother-in-law, Samuel Wilberforce, afterwards bishop of Oxford and of Winchester. Manning's married life was of brief duration. His young and beautiful wife was of a consumptive family, and died childless (July 24, 1837). The lasting sadness that thus early overshadowed him tended to facilitate his acceptance of the austere teaching of the Oxford Tracts; and though he was never an acknowledged disciple of Newman, it was due to the latter's influence that from this date his theology assumed an increasingly High Church character, and his printed sermon on the "Rule of Faith" was taken as a public profession of his alliance with the Tractarians. In 1838 he took a leading part in the Church education movement, by which diocesan boards were established throughout the country; and he wrote an open letter to his bishop in criticism of the recent appointment of the ecclesiastical commission. In December of that year he paid his first visit to Rome, and called on Dr Wiseman in company with W. E. Gladstone. In January 1841 Shuttleworth, bishop of Chichester, appointed him archdeacon, whereupon he began a personal visitation of each parish within his district, completing the task in 1843. In 1842 he published a treatise on *The Unity of the Church*, and his reputation as an eloquent and earnest preacher being by this time considerable, he was in the same year appointed select preacher by his university, thus being called upon to fill from time to time the pulpit which Newman, as vicar of St Mary's, was just ceasing to occupy. Four volumes of his sermons appeared between the years 1842 and 1850, and these had reached the 7th, 4th, 3rd and 2nd editions respectively in 1850, but were not afterwards reprinted. In 1844 his portrait was painted by Richmond, and the same year he published a volume of university sermons, in which, however,

was not included the one on the Gunpowder Plot. This sermon had much annoyed Newman and his more advanced disciples, but it was a proof that at that date Manning was loyal to the Church of England as Protestant. Newman's secession in 1845 placed Manning in a position of greater responsibility, as one of the High Church leaders, along with Pusey and Keble and Marriott; but it was with Gladstone and James Hope (afterwards Hope-Scott) that he was at this time most closely associated. In the spring of 1847 he was seriously ill, and that autumn and the following winter he spent abroad, chiefly in Rome, where he saw Newman "wearing the Oratorian habit and dead to the world." He had public and private audiences with the pope on the 9th of April and the 11th of May 1848, but recorded next to nothing in his diary concerning them, though numerous other entries show an eager interest in everything connected with the Roman Church, and private papers also indicate that he recognized at this time grave defects in the Church of England and a mysterious attractiveness in Roman Catholicism, going so far as to question whether he might not one day be a Roman Catholic himself. Returning to England, he protested, but with moderation, against the appointment of Hampden as bishop of Hereford, and continued to take an active part in the religious education controversy. Through the influence of Samuel Wilberforce, he was offered the post of sub-almoner to Queen Victoria, always recognized as a stepping-stone to the episcopal bench, and his refusal of it was honourably consonant with all else in his career as an Anglican dignitary, in which he united pastoral diligence with an asceticism that was then quite exceptional. In 1850 the decision of the privy council, that the bishop of Exeter was bound to institute the Rev. G. C. Gorham to the benefice of Brampford Speke in spite of the latter's acknowledged disbelief in the doctrine of baptismal regeneration, brought to a crisis the position within the Church of England of those who believed in that Church as a legitimate part of the infallible *Ecclesia docens*. Manning made it clear that he regarded the matter as vital,

though he did not act on this conviction until no hope remained of the decision being set aside or practically annulled by joint action of the bishops. In July he addressed to his bishop an open letter on "The Appellate Jurisdiction of the Crown in Matters Spiritual," and he also took part in a meeting in London which protested against the decision. In the autumn of this year (1850) was the great popular outcry against the "Papal aggression" (see WISEMAN), and Manning, feeling himself unable to take part in this protest, resigned, early in December his benefice and his archdeaconry; and writing to Hope-Scott, who a little later became a Roman Catholic with him, stated his conviction that the alternative was "either Rome or licence of thought and will." He was received into the Roman Catholic Church by Father Brownbill, S.J., at the church in Farm Street, on Passion Sunday, the 6th of April 1851. On the following Sunday he was confirmed and received to communion by Cardinal Wiseman, who also, within ten weeks of his reception, ordained him priest. Manning thereupon proceeded to Rome to pursue his theological studies, residing at the college known as the "Academy for Noble Ecclesiastics," and attending lectures by Perrone and Passaglia among others. The pope frequently received him in private audience, and in 1854 conferred on him the degree of D.D. During his visits to England he was at the disposal of Cardinal Wiseman, who through him, at the time of the Crimean War, was enabled to obtain from the government the concession that for the future Roman Catholic army chaplains should not be regarded as part of the staff of the Protestant chaplain-general. In 1857 the pope, *proprio motu*, appointed him provost (or head of the chapter) of Westminster, and the same year he took up his residence in Bayswater as superior of a community known as the "Oblates of St Charles," an association of secular priests on the same lines as the institute of the Oratory, but with this difference, that they are by their constitution at the beck and call of the bishop in whose diocese they live. The community was thus of the greatest service to Cardinal Wiseman, whose right-hand

man Manning thenceforward became. During the eight years of his life at Bayswater he was most active in all the duties of the priesthood, preaching, hearing confessions, and receiving converts; and he was notably zealous to promote in England all that was specially Roman and papal, thus giving offence to old-fashioned Catholics, both clerical and lay, many of whom were largely influenced by Gallican ideas, and had with difficulty accepted the restoration of the hierarchy in 1850. In 1860 he delivered a course of lectures on the pope's temporal power, at that date seriously threatened, and shortly afterwards he was appointed a papal domestic prelate, thus becoming a "Monsignor," to be addressed as "Right Reverend." He was now generally recognized as the able and effective leader of the Ultramontane party among English Roman Catholics, acting always, however, in subordination to Cardinal Wiseman; and on the latter's death (Feb. 15, 1865) it was felt that, if Manning should succeed to the vacant archbishopric, the triumph of Ultramontanism would be secured. Such a consummation not being desired by the Westminster chapter, they submitted to the pope three names, and Manning's was not one of them. Great efforts were made to secure the succession for the titular archbishop Errington, who at one time had been Wiseman's coadjutor with that right reserved to him, but who had been ousted from that position by the pope acting under Manning's influence. In such circumstances Pius IX. could hardly do otherwise than ignore Errington's nomination, as he also ignored the nomination of Clifford, bishop of Clifton, and of Grant, bishop of Southwark; and, by what he humorously described as "the Lord's own *coup d'état*," he appointed Manning to the archiepiscopal see. Consecrated at the pro-cathedral at Moorfields (since destroyed) by Dr Ullathorne, bishop of Birmingham (June 8, 1865), and enthroned there (Nov. 6), after receiving the *pallium* in Rome, Manning began his work as archbishop by devoting himself especially to the religious education of the poor and to the establishment of Catholic industrial and reformatory schools. He steadily

opposed whatever might encourage the admission of Catholics to the national universities, and so put his foot down on Newman's project to open a branch house of the Oratory at Oxford with himself as superior. He made an unsuccessful and costly effort to establish a Catholic university at Kensington, and he also made provision for a diocesan seminary of strictly ecclesiastical type. Jealous of the exclusive claims of the Roman Church, he procured a further condemnation at Rome of the "Association for the Promotion of the Unity of Christendom," which advocated prayers for the accomplishment of a kind of federal union between the Roman, Greek and Anglican Churches, and in a pastoral letter he insisted on the heretical assumption implied in such an undertaking. He also worked for the due recognition of the dignity of the secular or pastoral clergy, whose position seemed to be threatened by the growing ascendancy of the regulars, and especially of the Jesuits, whom, as a practically distinct organization within the Church, he steadily opposed. In addition to his diocesan synods, he presided in 1873 over the fourth provincial synod of Westminster, which legislated on "acatholic" universities, church music, mixed marriages, and the order of a priest's household, having previously taken part, as theologian, in the provincial synods of 1853 and 1859, with a hand in the preparation of their decrees. But it was chiefly through his strenuous advocacy of the policy of defining papal infallibility at the Vatican council (1869-1870) that Manning's name obtained world-wide renown. In this he was instant in season and out of season. He brought to Rome a petition in its favour from his chapter at Westminster, and during the progress of the council he laboured incessantly to overcome the opposition of the "inopportunists." And he never ceased to regard it as one of the chief privileges of his life that he had been able to take an active part in securing the definition, and in having heard with his own ears that doctrine proclaimed as a part of divine revelation. In 1875 he published a reply to Gladstone's attack on the Vatican decrees; and on the 15th of March in that

year he was created cardinal, with the title of SS. Andrew and Gregory on the Coelian. He was present at the death of Pius IX. (Feb. 7, 1878); and in the subsequent conclave, while some Italian cardinals were prepared to vote for his election to fill the vacant chair, he himself supported Cardinal Pecci, afterwards known as Leo XIII. With him, however, Manning found less sympathy than with his predecessor, though Manning's advocacy of the claims of labour attracted Leo's attention, and influenced the encyclical which he issued on the subject. After the Vatican council, and more especially after the death of Pius IX., Manning devoted his attention mainly to social questions, and with these his name was popularly associated during the last fifteen years of his life. From 1872 onwards he was a strict teetotaller, not touching alcohol even as a medicine, and there was some murmuring among his clergy that his teaching on this subject verged on heresy. But his example and his zeal profoundly influenced for good the Irish poor forming the majority of his flock; and the "League of the Cross" which he founded, and which held annual demonstrations at the Crystal Palace, numbered nearly 30,000 members in London alone in 1874. He sat on two royal commissions, the one on the housing of the working classes (1884), and the other on primary education (1886); and in each case the report showed evident marks of his influence, which his fellow-commissioners recognized as that of a wise and competent social reformer. In the cause of labour he was active for many years, and in 1872 he set an example to the clergy of all the churches by taking a prominent part in a meeting held in Exeter Hall on behalf of the newly established Agricultural Labourers' Union, Joseph Arch and Charles Bradlaugh being among those who sat with him on the platform. In later years his strenuous advocacy of the claims of the working classes, and his declaration that "every man has a right to work or to bread" led to his being denounced as a Socialist. That he was such he denied more than once (Lemire, *Le Cardinal Manning et son action sociale*, Paris, 1893, p. 210), nor was he ever a Socialist in principle;

but he favoured some of the methods of Socialism, because they alone seemed to him practically to meet the case of that pressing poverty which appealed to his heart. He took a leading part in the settlement of the dockers' strike in the autumn of 1889, and his patient and effectual action on this and on similar occasions secured for him the esteem and affection of great numbers of working men, so that his death on the 14th of January 1892, and his funeral a week later, were the occasion for a remarkable demonstration of popular veneration. The Roman Catholic Cathedral at Westminster is his joint memorial with his predecessor, Cardinal Wiseman.

Whatever may have been the value of Manning's services to the Roman Catholic Church in England in bringing it, as he did, up to a high level of what in earlier years was commonly denounced as Ultramontanism, it is certain that by his social action, as well as by the earnestness and holiness of his life, he greatly advanced, in the minds of his countrymen generally, their estimate of the character and value of Catholicism. Pre-eminently he was a devout ecclesiastic, a "great priest"; and his sermons, both Anglican and Catholic, are marked by fervour and dignity, by a conviction of his own authoritative mission as preacher, and by an eloquent insistence on considerations such as warm the heart and bend the will rather than on such as force the intellect to assent. But many of his instincts were those of a statesman, a diplomatist, a man of the world, even of a business man; and herein lay, at least in part, the secret of his influence and success. Intellectually he did not stand in the front rank. He was neither a philosopher nor a literary genius. Among his many publications, written, it is only fair to admit, amidst the urgent pressure of practical work, there is barely a page or even a sentence that bears the stamp of immortality. But within a somewhat narrower field he worked with patience, industry, and self-denying zeal; his ambition, which seemed to many personal, was rather the outcome of his devotion to the cause of the Church; and in the later years of his life especially he showed that he loved righteousness and hated

iniquity, and that he realized as clearly as any one that the service of God was incomplete without the service of man.

The publication in 1896 of Manning's *Life*, by Purcell, was the occasion for some controversy on the ethics of biography. Edward Purcell was an obscure Catholic journalist, to whom Manning, late in life, had entrusted, rather by way of charitable bequest, his private diaries and other confidential papers. It thus came to pass that in Purcell's voluminous biography much that was obviously never intended for the public eye was, perhaps inadvertently, printed, together with a good deal of ungenerous comment. The facts disclosed which mainly attracted attention were: (1) that Manning, while yet formally an Anglican, and while publicly and privately dissuading others from joining the Roman Catholic Church, was yet within a little convinced that it was his own duty and destiny to take that step himself; (2) that he was continually intriguing at the back-stairs of the Vatican for the furtherance of his own views as to what was desirable in matters ecclesiastical; (3) that his relations with Newman were very unfriendly; and (4) that, while for the most part he exhibited towards his own clergy a frigid and masterful demeanour, he held privately very cordial relations with men of diverse religions or of no theological beliefs at all. And certainly Manning does betray in these autobiographical fragments an unheroic sensitiveness to the verdict of posterity on his career. But independent critics (among whom may specially be named François de Pressensé) held that Manning came well through the ordeal, and that Purcell's *Life* had great value as an unintentionally frank revelation of character.

(A. W. Hu.)

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1 Purcell's assertion that the year of his birth was 1807 rests on no trustworthy evidence.

MANNY, SIR WALTER DE MANNY, Baron de (d. 1372), soldier of fortune and founder of the Charterhouse, younger son of Jean de Mauny, known as Le Borgne de Mauny, by his wife Jeanne de Jenlain, was a native of Hainaut, from whose counts he claimed descent. Manny—the name is thus spelt by most English writers—was a patron and friend of Froissart, in whose chronicles his exploits have a conspicuous and probably an exaggerated place. He appears to have first come to England as an esquire of Queen Philippa in 1327, and he took a distinguished part in the Scottish wars of Edward III. In 1337 he was placed in command of an English fleet, and in the following year accompanied Edward to the continent, where in the campaigns of the next few years he proved himself one of the boldest and ablest of the English king's military commanders. He was summoned to parliament as a baron by writ from the 12th of November 1347 to the 8th of January 1371. In 1359 he was made a knight of the Garter; and at various times he received extensive grants of land both in England and in France. He was frequently employed by King Edward in the conduct of diplomatic negotiations as well as in military commands. He was one of those charged with the safe custody of the French king John when a prisoner at Calais in 1360; in 1369 he was second in command under John of Gaunt in his invasion of France.

But Manny is chiefly remembered for his share in the foundation of the Charterhouse in London. In 1349 he bought some acres of land near Smithfield, which were consecrated as a burying-place where large numbers

of the victims of the Black Death were interred; and here he built a chapel, from which the place obtained the name of “Newchurchhaw.” The chapel and ground were bought from Manny by the bishop of London, Michael de Northburgh, who died in 1361 and by his will bequeathed a large sum of money to found there a Carthusian convent. It is not clear whether this direction was ever carried out; for in 1371 Manny obtained letters patent from King Edward III. permitting him to found, apparently on the same site, a Carthusian monastery called “La Salutation Mère Dieu,” where the monks were to pray for the soul of Northburgh as well as for the soul of Manny himself. The bishop’s bequest may have contributed to the building and endowment of the house; or possibly, as seems to be implied by a bull granted by Urban VI. in 1378, there were originally two kindred establishments owing their foundation to Northburgh and Manny respectively. At all events Manny, who died early in 1372, left instructions that he was to be buried in the church of the Carthusian monastery founded by himself. About 1335 he married Margaret, daughter and heiress of Thomas Plantagenet, earl of Norfolk, son of King Edward I., whose first husband had been John, Lord Segrave. This lady, who outlived Manny by many years, was countess of Norfolk in her own right, and she was created duchess of Norfolk in 1397. Manny left no surviving son. His daughter Anne, Baroness de Manny in her own right, married John Hastings, 2nd earl of Pembroke; and on the death of her only son unmarried in 1389, the barony of Manny became extinct.

See *Œuvres de Froissart, I. Chroniques*, edited by Baron Kervyn de Lettenhove (Brussels, 1867-1877), and the Globe edition of *Froissart's Chronicles* (Eng. trans., London, 1895); G. F. Beltz, *Memorials of the Most Noble Order of the Garter* (London, 1841); *Chronicon Angliae 1323-1388*, edited by E. Maunde Thompson (Rolls series 64, London, 1874); Philip Bearcroft, *An Historical Account of Thomas Sutton and of his Foundation in Charterhouse* (London, 1737).

MANNYNG, ROBERT (Robert of Brunne) (*c.* 1264-1340?),

English poet, was a native of Brunne, now Bourne, in Lincolnshire. About 6 m. from Bourne was the Gilbertine monastery of Sempringham, founded by Sir Gilbert de Sempringham in 1139. The foundation provided for seven to thirteen canons, with a number of lay brothers and a community of nuns. No books were allowed to the lay brothers and nothing could be written in the monastery without the prior's consent. Mannyng entered this house in 1288, when, according to the rules, he must have been at least 24 years of age, if, as is supposed, he was a lay brother. He says he was at Cambridge with Robert de Bruce and his two brothers, Thomas and Alexander, but this does not necessarily imply that he was a fellow-student. There was a Gilbertine monastery at Cambridge, and Mannyng may have been there on business connected with his order. When he wrote *Handlyng Synne* he had been (11. 63-76) fifteen years in the priory, beginning to write in "englysch rime in 1303." Thirty-five years later he began his *Story of Inglande*, and had

removed (11. 139, &c.) to the monastery of Sixille (now Sixhills), near Market Rasen, in north Lincolnshire.

Handlyng Synne, a poem of nearly 13,000 lines, is a free translation, with many additions and amplifications, from William of Waddington's *Manuel des Pechiez*. It is a series of metrical homilies on the Ten Commandments, the Seven Deadly Sins and the Seven Sacraments, illustrated by a number of amusing stories from various sources. The *Cursor Mundi* had turned religious history into something not very different from a romance of chivalry, and in the stories of *Handlyng Synne* the influence of the *fabliaux* is not far to seek. Mannyng wrote in the English tongue not for learned but for "lewd" men, "that talys and ryme wyl blethly here," to occupy the leisure hours during which they might otherwise fall into "vylanye, dedly synne or other folye." Each of his twenty-four topics has its complement of stories. He tells of the English observance of Saturday afternoon as holy to the Virgin, and has much to say of popular amusements, which become sins when they keep people away from church. Tournaments in particular are fertile occasions of all the deadly sins; and mystery plays, except those of the birth and resurrection of Christ performed in the churches, also lead men into transgression. He inveighs against the oppression of the poor by the rich, reproves those who, weary of matins or mass, spend their time in church "jangling," telling tales, and wondering where they will get the best ale, and revives the legend of the dancers at the church door during mass who were cursed by the priest and went on dancing for a twelvemonth without cessation. He loved music himself, and justified this profane pleasure by the example of Bishop Grosseteste, who lodged his harper in the chamber next his own; but he holds up as a warning to gleemen the fate of the minstrel who sang loud while the bishop said grace, and was miserably killed by a falling stone in consequence. The old monk's keen observation makes the book a far more valuable contribution to history than his

professed chronicle. It is a storehouse of quaint stories and out-of-the-way information on manners and customs.

His chronicle, *The Story of Inglande*, was also written for the solace and amusement of the unlearned when they sit together in fellowship (11. 6-10). The earlier half is written in octosyllabic verse, and begins with the story of the Deluge. The genealogy of Locrine, king of Britain, is traced back to Noah, through Aeneas, and the chronicler relates the incidents of the Trojan war as told by Dares the Phrygian. From this point he follows closely the *Brut* of Wace. He loved stories for their own sake, and found fault with Wace for questioning the miraculous elements in the legend of Arthur. In the second half of his chronicle, which is less simple in style, he translates from the French of Pierre de Langtoft. He writes in rhyming alexandrines, and in the latter part of the work uses middle rhymes. Mannyng's *Chronicle* marks a change in national sentiment. Though he regards the Norman domination as a "bondage," he is loud in his praises of Edward I., "Edward of Inglond."

The linguistic importance of Mannyng's work is very great. He used very few of those Teutonic words which, though still in use, were eventually to drop out of the language, and he introduced a great number of French words destined to be permanently adopted in English. Moreover, he employed comparatively few obsolete inflexions, and his work no doubt furthered the adoption of the Midland dialect as the acknowledged literary instrument. T. L. Kington-Oliphant (*Old and Middle English*, 1878) regards his work as the definite starting point of the New English which with slight changes was to form the language of the Book of Common Prayer.

A third work, usually ascribed to Mannyng, chiefly on the ground of its existing side by side with the *Handlyng Synne* in the Harleian and Bodleian MSS., is the *Medytacyuns of the Soper of oure lorde Jhesu, And also of hys passyun And eke of the peynes of hys swete modyr, Mayden marye*, a free translation of St Bonaventura's *De coena et passione Domini....*

Robert of Brunne's *Chronicle* exists in two MSS.: Petyt MS. 511, written in the Northern dialect, in the Inner Temple library; and Lambeth MS. 131 in a Midland dialect. The first part was edited *The Story of England* ... (1887) for the Rolls Series, with an introductory essay by F. J. Furnivall; the second part was published by Thomas Hearne as *Peter Langtoft's Chronicle* ... (1725). Peter Langtoft's French version was edited by Thomas Wright for the "Rolls Series" in 1866. Of *Handlyng Synne* there are complete MSS. in the Bodleian library (MS. 415) and in the British Museum (Harleian MS. 1701), and a fragment in the library of Dulwich College (MS. 24). It was edited, with Waddington's text in parallel columns, by F. J. Furnivall for the Roxburghe Club (1862), and for the Early English Text Society (1901-1903). The *Meditacyun* was edited from the Bodleian and Harleian MSS. by J. Meadow Cooper for the same society (1875). See also Gerhard Hellmers, *Ueber die Sprache Robert Mannyngs of Brunne und über die Autorschaft der ihm zugeschriebenen Meditations* ... (Göttingen, 1885), which contains an analysis of the dialectic peculiarities of Mannyng's work; O. Boerner, "Die Sprache Robert Mannyngs" ... in *Studien zur engl. Philologie* (vol. xii., Halle, 1904) and Oskar Preussner, *Robert Mannyng of Brunne's Übersetzung von Pierre de Langtofts Chronicle* (Breslau, 1891). All accounts of his life are based on his own work. For the Sempringham priory see Dugdale, *Monasticon* vi. 947 seq., and Miss Rose Graham's *S. Gilbert of Sempringham and the Gilbertines* (1901).

MANŒUVRES, MILITARY. Manœuvres may be defined as the higher training for war of troops of all arms in large bodies, and have been carried out in most countries ever since the first formation of standing armies. In England no manœuvres or camps of exercise appear to have been held till the beginning of the 19th century, when Sir John Moore trained the famous Light Brigade at Shorncliffe camp. In France, however, under Louis XIV., large camps of instruction were frequently held, the earliest recorded being that of 18,000 troops at Compiègne in 1666; and these were continued at intervals under his successor. At these French camps much time was devoted to ceremonial, and the manœuvres performed were of an elementary description. Still their effect upon the training of the army for war was far-reaching, and bore fruit in the numerous wars in the first half of the 18th century. Moreover, experiments were made with proposed tactical systems and technical improvements, as in the case of the contest between *l'ordre mince* and *l'ordre profonde* (see INFANTRY) between 1785 and 1790. Other countries followed suit, but it was reserved for Frederick the Great to inaugurate a system of real manœuvres and to develop on the training-ground the system of tactics which bore such good fruit in his various campaigns. The numbers of troops assembled were large; for example, at Spandau in 1753, when 36,000 men carried out manœuvres for twelve days. The king laid the greatest stress on these exercises, and took immense pains to turn to account the experience gained in his campaigns. Great secrecy was observed, and before the Seven Years' War no stranger was allowed to be present. The result of all this careful training was shown in the Seven Years' War, and after it the Prussian manœuvres gained a reputation which they have maintained to this day. But with the passing away of the great king they became more and more pedantic, and the fatal results were shown in 1806. After the Napoleonic wars yearly manœuvres became the custom in every large Continental army. Great Britain alone thought she could dispense with them, perhaps because of the constant practical training her troops and officers received in the various Indian and colonial wars; and it was not till

1853 that, by the advice of the Prince Consort, a body of troops were gathered together for a camp of exercise on Chobham Common, and that eventually a standing camp of exercise was evolved out of the temporary camp formed during the Crimean War at Aldershot.

Most continental armies have, since the great successes of the Germans in 1870, copied more or less their system of military training; hence it is appropriate to consider their methods first. The whole training of the army is based on a yearly programme of gradual progression, from the joining of the recruits in October to the training by squads, companies, battalions and regiments, the latter finishing their field training about the middle of August, when the manœuvre period begins. First of all, the brigades go through five working days of drills on flat ground, to get them under the hand of their commanders and prepare them for manœuvres. Then follow ten working days of manœuvres in new and varied ground, of which four are "brigade," four "divisional" and two "corps" manœuvres, in each case the unit named being divided into two portions of all arms, which manœuvre against one another. Each year two or more army corps carry out manœuvres before the emperor, working against one another. The chief feature of the German manœuvres is the free hand allowed to leaders of sides. Of course, for reasons of supply and transport, it is necessary to keep the troops within a certain area, but the general and special ideas[1] are so framed that, while retaining their own initiative, the leaders of sides have to give such orders as will suit the arrangements made by the director of manœuvres for supply. The faculty of quartering troops on private individuals to any extent, and the fact of the troops being provided with portable tent equipment, give great latitude to the German leaders in their choice of quarters for troops, and so increase the similitude of manœuvres to war. The Austrian and Italian manœuvres are a close copy of the German, but those of the French present the

peculiarity of a certain amount of prearrangement, especially at grand manœuvres, when it is frequently laid down beforehand which side is to be victorious. Thus a series of pictures of war is presented, but the manœuvres are hardly a test of the skill of the rival leaders. But, just as in recent years in France this practice has been modified, so also the entire liberty given to commanders in the German manœuvres in 1906-7 had to be curtailed in the following years owing to the strain of forced marches which it entailed on the troops.

In Russia the climatic and social conditions, and the distribution of the army, necessitate a quite peculiar system. The troops leave their barracks and move into standing camps, generally in May, and in these for about three months their training up to that in battalions is carried out on the drill ground. Camps of mixed units are then formed for a month, and from them, but always over the same ground, the manœuvres of regiments, brigades and divisions are performed. Then follow the so-called mobile manœuvres, which last for ten days or a fortnight. Of all European manœuvres these are perhaps the nearest approach to war, for the sides start a great distance apart, and ample time is allowed for cavalry reconnaissance. Besides, the Russian soldier does not require elaborate arrangements for supply; hence the director is not so tied down by consideration of this matter as in other armies. A political colour is sometimes given to such large assemblages of troops, especially when the manœuvres take place in frontier districts.

In England the military authorities have long been hampered in the organization of manœuvres by the necessity of carrying them out on very limited portions of government land or on areas lent as a favour by, or hired from, private individuals. There has been no want of recognition by the military authorities of the necessity for, and value of, manœuvres, and the training at the camps of instruction has been supplemented as far as possible by small manœuvres on such portions

of country as could be made available. But, with the exception of spasmodic efforts in 1871 and 1872, it was not until 1897 that the government allowed itself to be convinced by its military advisers, and passed a Military Manœuvres Act, by which certain districts could be "proclaimed" for purposes of manœuvres, and troops in consequence could traverse all ground. In 1898 the first manœuvres under this Act were held in Wilts and Dorset, and were intended to be repeated at fixed intervals in future years. In addition, every effort was made to add to the existing permanent training grounds for troops, and ground was acquired on Salisbury Plain with the intention of developing it into a second Aldershot. But the training on those well-known grounds, excellent as it is in itself as a preparation, is not "manœuvres," and never can do away with the necessity for them, with a more or less free hand given to the leaders over fresh country.

Much misconception prevails as to the nature and limitation of the military instruction to be imparted at manœuvres. Manœuvres are a school for the leaders, in a less degree for the led, and consequently the minor details of instruction must be completed, and the troops fully trained as units, before they can take part in them with advantage. The time during which large bodies of troops can be kept together for manœuvres is too short, and the expense too great, to justify time being spent on exercises which might as well be carried out in the ordinary stations or at the great training camps. Therefore it may be laid down as a principle that manœuvres, properly so-called, should be begun with units not smaller than a brigade of infantry on each side, with a due proportion of the other arms attached. It is useful if these can precede the manœuvres of larger bodies, as the training is then progressive and the result more satisfactory.[2]

The choice of ground is of great importance. Its extent should be proportionate to the force to be employed and the nature of the

instruction to be imparted. It should not be too hilly nor yet too flat, but both descriptions should be judiciously combined; and regard must be had to the water supply and the road and railway net for the convenience of the supply service. Once the ground has been selected, the general and special ideas must be so framed that the troops are thereby confined to the chosen ground without seeming to tie the hands of the leaders of sides. It is of great advantage if the same idea can be maintained throughout each series of operations, as thereby the interest of all concerned and the likeness to actual warfare are increased; and, if possible, the "state of war" should be continuous also. Within the limits of the special idea, the utmost latitude should be left to leaders; but if the orders of one or both sides seem to render a collision unlikely, the director should so modify the special idea as to compel one or other to re-cast his orders in such a way that contact is brought about. Such interference will scarcely be necessary after the first issues of orders in each series. In war the number of marching days vastly outnumbers those of fighting, but in manœuvres this must not be allowed; tactical instruction is what is desired, and a manœuvre day in which none is imparted is not fully utilized. It is not necessary that all the troops should be engaged, but at least the advanced bodies must come into contact, and the rest must carry out marches as on active service. Each action should be fought to its end, "Cease firing" being sounded when the crisis has been reached; and on a decision being given by the director, one side should retire and the fight be broken off in a proper military manner. The troops should place outposts each day, and act in all respects as if on active service.

The quartering and supply of troops are the chief difficulties in the arrangement of manœuvres, and afford ample opportunity for the practising of the officers and departments responsible for these matters. In England, where in peace it is not possible to billet troops on private

individuals, quartering must be replaced by encampments or bivouacs, and the selection of ground for them affords invaluable practice. If possible, their position should be selected to conform to the military situation; but if it is found necessary, for reasons of water or food supply, to withdraw troops to positions other than such as they would occupy in real warfare, time should be allowed them on the following day to regain the positions they would otherwise have occupied. It is next to impossible, for various reasons, financial and other, to organize the food supply in manœuvres as it would be in war. Sufficient transport cadres cannot be kept up in peace, and consequently recourse must be had to hired transport, which cannot be treated as a military body. Again, food cannot be requisitioned, and local purchase at the time cannot be trusted to; so dépôts of supplies must be formed beforehand in the manœuvres area, which more or less tie the hands of the supply service. Still, with a judicious choice of the points at which these are formed, much may be done to approximate to service conditions, and the more nearly these are realized the more instructive for the supply will the manœuvres become.

Finally, a word must be said as to the umpire staff, which represents the bullets. The most careful selection of officers for this important duty is necessary, and they must have sufficient authority and be in sufficient number to make their influence everywhere felt. Their principal object should be to come to a decision quickly, so as to prevent the occurrence of unreal situations; and by constant intercommunication they must ensure uniformity in their decisions, and so maintain continuity of the action all over the manœuvres battlefield. (J. M. Gr.)

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1 The “general idea” is a document, communicated to both sides, containing such general information of the war—the supposed frontiers, previous battles, &c.—as would be matters of common knowledge. The “special idea” of each side comprises the instructions upon which it is acting.

2 Manœuvres incidentally afford an excellent opportunity of testing new patterns of equipment, transport or other matériel under conditions approximating to those of active service.

MANOMETER (Gr. μανός, thin or loose; μέτρον, a measure), an instrument for measuring the pressures exerted by gases or vapours. An alternative name is pressure gauge, but this term may conveniently be restricted to manometers used in connexion with steam-boilers, &c. The principle of hydrostatics suggest the most common forms. Suppose we have a **U** tube (fig. 1), containing a liquid: if the pressures on the surfaces of the liquid be equal, then the surfaces will be at the same height. If, on the other hand, the pressure in one limb be greater than the pressure in the other, the surfaces will be at different heights, the difference being directly proportional to the difference of pressures and inversely as the specific gravity of the liquid used.

FIG. 1.

FIG. 2.

Two forms are in use: (1) the “open-tube,” in which the pressure in one limb is equal to the atmospheric pressure, and (2) the “closed-tube,” in which the experimental pressure is balanced against the liquid column and the air compressed into the upper part of a closed limb of the tube. In the “open tube” form (fig. 1) the pressure on the surface *a* is equal to the pressure on the surface at b (one atmosphere) plus the hydrostatic pressure exerted by the liquid column of height a b. The liquid commonly used is mercury. If a scale be placed behind the limbs of the tube, so that the difference a b can be directly determined, then the pressure in *a* is at once expressible as P + *a b* in millimetres or inches of mercury, where P is the atmospheric pressure, known from an ordinary barometric observation. In the “closed tube” form (fig. 2) the calculation is not so simple, for the variation of pressure on the mercury surface in the closed limb has to be taken into account. Suppose the length of the air column in the closed limb be *h* when the mercury is at the same height in both tubes. Applying the experimental pressure to the open end, if this be greater than atmospheric pressure the mercury column will rise and the air column diminish in the closed limb. Let the length of the air column be h', then its pressure is h/h' atmospheres. The difference in height of the mercury columns in the two limbs is $2(h - h')$, and the pressure in the open limb is obviously equal to that of a column of mercury of length $2(h - h')$, plus h/h' atmospheres. These instruments are equally serviceable for determining pressures less than one atmosphere. In laboratory practice, *e.g.* when it is required to determine the degree of exhaust of a water pump, a common form consists of a vertical glass tube having its lower end immersed in a basin of mercury, and its upper end connected by means of an intermediate vessel to the exhaust. The mercury rises in the tube, and the difference between the barometric height and the length of the mercury column gives the pressure attained.

MANOR. Any definition of a manor, in land tenure, must take note of two elements—economic and political. The manor has an estate for its basis, although it need not coincide with an estate, but may be wider. It is also a political unit, a district formed for purposes of government, although the political functions made over to it may greatly vary. As a lordship based on land tenure, the manor necessarily comprises a ruler and a population dependent on him, and the characteristic trait of such dependence consists not in ownership extending over persons, as in slave-holding communities, nor in contractual arrangements, as in a modern economic organization, but in various forms and degrees of subjection, chiefly regulated by custom. In the sense mentioned the manor is by no means a peculiarly English institution; it occurs in every country where feudalism got a hold. Under other names we find it not only in France, Germany, Italy, Spain, but also, to a certain extent, in the Byzantine Empire, Russia, Japan, &c. It is especially representative of an aristocratic stage in the development of European nations. When tribal notions and arrangements ceased to be sufficient for upholding their commonwealths, when social and political life had to be built up on the basis of land-tenure, the type of manorial organization came forward in natural course. It was closely connected with natural economy, and was suited to a narrow horizon of economic wants and political requirements. At the same time it provided links for a kind of national federation of military estates. We shall only speak of the course of manorial evolution in France and Germany, because this presents the clearest

expression of the fundamental principles of manorial life and the best material for comparison with English facts.

One problem common to the entire European world has to be considered from the very beginning. Does the manor date from the Roman Empire, or not? Can its chief features be traced in Roman institutions? There can be no doubt that at the end of the Roman period certain traits are noticeable which might, under favourable conditions, develop into a manorial combination. Great estates with political functions, populations subjected to the political lordship of landowners, appear in the closing centuries of the empire, and have to be reckoned with as precursors of medieval manorial life. The original organization of the ancient world was built up on the self-government of cities and on the sharp distinction between citizens and slaves. Both features were gradually modified by the Roman Empire. Self-government was atrophied by bureaucratic interference; the economy based on the exploitation of slaves began to give way before relations in which the elements of freedom and serfdom were oddly mixed. During the last centuries of its existence the Western Empire became more and more a conglomerate of barbaric and half-civilized populations, and it is not strange that the characteristic germs of feudalism began to show themselves within its territory as well as outside it. As far as political institutions are concerned, we notice that the central power, after claiming an absolute sway over its subjects, is obliged more and more to lean on private forces in order to maintain itself. One of its favourite resources in the 4th and 5th centuries consists in making great landowners responsible for the good behaviour of their tenants and even of their less important neighbours. The *saltus*, the great domain, is occasionally recognized as a separate district exempt from the ordinary administration of the city, subordinated to its owner in respect of taxes and police. Even in ordinary estates (*fundi*) there is a tendency to make the landowner responsible for military conscription, for the presentation of criminals to justice. On the other hand the incumbents of

ecclesiastical offices are nominated in accordance with the wishes of patrons among the landowners; in the administration of justice the influence of this same class makes itself felt more and more. Nor are signs of a convergent evolution wanting on the economic side. Slaves are used more and more as small householders provided with rural tenements and burdened with rents and services. Free peasant farmers holding by free agreement get more and more reduced to a status of half-free settlers occupying their tenancies on the strength of custom and traditional ascription to the glebe. Eventually this status is recognized as a distinct class by imperial legislation. Ominous symptoms of growing political disruption and of an aristocratic transformation of society were visible everywhere at the close of the empire. Yet there could be no talk of a manorial system as long as the empire and the commercial intercourse protected by it continued to exist.

The fall of the empire hastened the course of evolution. It brought into prominence barbaric tribes who were unable to uphold either the political power or the economic system of the Romans. The Germans had from old certain manorial features in the constitution of their government and husbandry. The owner of a house had always been possessed of a certain political power within its precincts, as well as within the fenced area surrounding it: the peace of the dwelling and the peace of the hedged-in yard were recognized by the legal customs of all the German tribes. The aristocratic superiority of warriors over all classes engaged in base peaceful work was also deeply engraved in the minds of the fighting and conquering tribes. On the other hand the downfall of complicated forms of civilization and civil intercourse rendered necessary a kind of subjection in which tributary labourers were left to a certain extent to manage their own affairs. The Germanic conqueror was unable to move slaves about like draughts: he had no scope for a complicated administration of capital and work. The natural outcome was to have recourse to serfdom with its convenient system of tribute and services.

But, as in the case of the Roman Empire, the formation of regular manors was held back for a time in the early Germanic monarchies by the lingering influence of tribal organization. In the second period of medieval development in continental Europe, in the Carolingian epoch, the features of the estate as a political unit are more sharply marked. Notwithstanding the immense efforts of Charles Martel, Pippin and Charlemagne to strengthen the tottering edifice of the Frankish Empire, public authority had to compromise with aristocratic forces in order to ensure regular government. As regards military organization this is expressed in the recognition of the power of *seniores*, called upon to lead their vassals in the host; as regards jurisdiction, in the increase of the numbers of commended freemen who seek to interpose the powerful patronage of lay and secular magnates between themselves and the Crown. Great estates arose not only on the lands belonging to the king, but on that of churches and of lay potentates, and the constitution of these estates, as described for instance in the Polyptique of St Germain des Près or in the "Brevium exempla ad describendas res ecclesiasticas et fiscales" (*Capitularia*, ed. Boretius, i. 250), reminds us forcibly of that of later feudal estates. They contain a home-farm, with a court and a *casa indominicata*, or manor-house, some holdings (*mansi*) of free men (*ingenuiles*), of serfs (*serviles*), and perhaps of half-free people (*lidiles*). The rents and services of this dependent population are stated in detail, as in later custumals, and there is information about the agricultural implements, the stores and stock on the home-farm. Thus the economic basis of the manor exists in more or less complete order, but it cannot be said as yet to form the prevailing type of land tenure in the country. Holdings of independent free men and village organizations of ancient type still surround the great estates, and in the case of ecclesiastical possessions we are often in a position to watch their gradual extension at the expense of the neighbouring free settlers, by way of direct encroachment, and by that of surrender and commendation on the part of the weaker citizens. Another factor which plays a great part in the gradual process of infeudation is the

rise of private jurisdictions, which falls chiefly into the 10th and 11th centuries. The struggle against Northmen, Magyars and Slavs gave a crowning touch to the process of localization of political life and of the aristocratic constitution of society.

In order to describe the full-grown continental manor of the 11th century it is better to take French examples than German, Italian or Spanish. Feudalism in France attained the greatest extension and utmost regularity, while in other European countries it was hampered and intermixed with other institutional features. The expression best corresponding to the English "manor," in the sense of an organized district, was *seigneurie*. *Manoir* is in use, and is, of course, a French word corresponding to *manerium*, but it meant strictly "mansion" or chief homestead in France. *Baronie* is another term which might be employed in some instances as an equivalent of the English manor, but, in a sense, it designates only one species of a larger genus, the estate of a full baron in contrast to a mere knight's fee, as well as to a principality. Some of the attributes of a baron are, however, typical, as the purest expression of manorial rights, and may be used in a general characterization of the latter.

The *seigneurie* may be considered from three points of view—as a unit of administration, as an economic unit, and as a union of social classes.

(*a*) In principle the disruption of political life brought about by feudalism ought to have resulted in the complete administrative independence of the manor. *Chaque baron est souverain dans sa baronie* is a proverb meant to express this radical view of manorial separatism. As a matter of fact this separatism was never completely realized, and even at the time of the greatest prevalence of feudalism the little sovereigns of France were combined into a loose federation of independent fiefs. Still, the proverb was not a mere play of words, and it

took a long time for the kings of France to break in potentates, like the little Sire de Coucy in the immediate vicinity of Paris, who sported in his crest the self-complacent motto: *Je ne suis ni comte, ni marquis, je suis le sire de Coucy*. The institutional expression of this aspect of feudalism in the life of the *seigneurie* was the jurisdiction combined with the latter. The principal origin of this jurisdiction was the dismemberment of royal justice, the acquisition by certain landowners of the right of holding royal pleas. The assumption of authority over public tribunals of any kind was naturally considered as equivalent to such a transmission of royal right. But other sources may be noticed also. It was assumed by French feudal law that in all cases when land was granted by a *seigneur* in subinfeudation the recipients would be bound to appear as members of a court of tenants for the settlement of conflicts in regard to land. A third source may be traced in the extension of the patrimonial justice of a person over his serfs and personal dependents to the classes of free and half-free population connected with the *seigneurie* in one way or another. There arose in consequence of these assumptions of jurisdiction a most bewildering confusion of tribunals and judicial rights. It happened sometimes that the question as to who should be the judge in some particular contest was decided by matter-of-fact seizure—the holder of pleas who was the first on the spot to proclaim himself judge in a case was deemed entitled to jurisdiction. In other cases one *seigneur* held the pleas in a certain place for six days in the week, while some competitor of his possessed jurisdiction during the seventh. A certain order was brought into this feudal chaos by the classification of judiciary functions according to the four categories of high, middle, low and tenurial justice. The scope of the first three subdivisions is sufficiently explained by their names; the fourth concerned cases arising from subinfeudation. As a rule the baron or *seigneur* sat in justice with a court of assessors or peers, but the constitution of such courts varied a great deal. They represented partly

the succession of the old popular courts with their *scabini*, partly courts of vassals and tenants. In strict feudal law an appeal was allowed from a lower to a higher court only in a case of a denial of justice (*dénie de justice*), not in error or revision of sentence. This rule was, however, very often infringed, and gave way ultimately before the restoration of royal justice.

(*b*) The economic fabric of the French *seigneurie* varied greatly, according to localities. In the north of France it was not unlike that of the English manor. The capital messuage, or castle, and the home-farm of the lord, were surrounded by dependent holdings, *censives*, paying rent, and villein tenements burdened with services. Between these tenancies there were various ties of neighbourhood and economic solidarity recalling the open-field cultivation in England and Germany. When the harvest was removed from the open strips they returned to a state of undivided pasture in which the householders of the village exercised rights of common with their cattle. Wild pasture and woods were used more or less in the same fashion as in England (*droit de pacage de vaine pâture*). The inhabitants often formed courts and held meetings in order to settle the by-laws, and to adjudicate as to trespasses and encroachments (*courts colongères*). In the south, individual property was more prevalent and the villagers were not so closely united by ties of neighbourhood. Yet even there the dependent households were arranged into *mansi* or *colonicae*, subjected to approximately equal impositions in respect of rents and services. In any case the characteristic dualism of manorial life, the combined working of a central home-farm, and of its economic satellites providing necessary help in the way of services, and contributing towards the formation of manorial stores, is quite as much a feature of French as of English medieval husbandry.

(*c*) The social relations between the manorial lord and his subjects are marked by various forms of the exploitation of the latter by the former. Apart from jurisdictional profits, rents and agricultural services, dues of all kinds are exacted from the rural population. Some of these dues have to be traced to servile origins, although they were evidently gradually extended to groups of people who were not descended from downright serfs but had lapsed into a state of considerable subjection. The *main morte* of rustic tenants meant that they had no goods of their own, but held movable property on sufferance without the right of passing it on to their successors. As a matter of fact, sons were admitted to inheritance after their fathers, and sometimes succession was extended to other relatives, but the person taking inheritance paid a heavy fine for entering into possession, or gave up a horse, an ox, or some other especially valuable piece of property. The *formariage* corresponded to the English *merchetum*, and was exacted from rustics on the marriage of their daughters. Although this payment assumed very different shapes, and sometimes only appeared in case consorts belonged to different lords, it was considered a badge of serfdom. *Chevage* (*capitagium*) might be exacted as a poll-tax from all the unfree inhabitants of a *seigneurie*, or, more especially, from those who left it to look for sustenance abroad. The power of the lord as a landowner was more particularly expressed in his right of pre-emption (*retrait seigneurial*), and in taxes on alienation (*lods et ventes*). As a person wielding political authority, a kind of sovereignty, the lord enjoyed divers rights which are commonly attributed to the state—the right of coining money, of levying direct taxes and toll (*tallagium, tolneta*) and of instituting monopolies. These latter were of common occurrence, and might take the shape, for instance, of forcing the inhabitants to make use of the lord's mill (*moulin banal*), or of his oven (*four banal*), or of his bull (*taureau banal*).

In Germany the history of the manorial system is bound up with the evolution of the *Grundherrschaft* (landlordship) as opposed to *Gutsherrschaft* (estate-ownership). The latter need not include any elements of public authority and aristocratic supremacy: the former is necessarily connected with public functions and aristocratic standing. The centre of the *Grundherrschaft* was the *Hof*, the court or hall of the lord, from which the political and economic rights of the lord radiated. The struggle of the military aristocracy and of ecclesiastical institutions with common freedom was more protracted than in France or England; the lordships very often took the shape of disparate rights over holdings and groups of population scattered over wide tracts of country and intermixed with estates and inhabitants subjected to entirely different authority. Therefore the aspect of German manorialism is more confused and heterogeneous than that of the French or English systems. One remarkable feature of it is the consistent separation of criminal justice from other kinds of jurisdiction on Church property. Episcopal sees and abbeys delegated their share of criminal justice to lay magnates in the neighbourhood (*Vogtei*), and this division of power became a source of various conflicts and of many entangled relations. The main lines of German manorialism are not radically different from those of France and England. The communal element, the *Dorfverband*, is usually more strongly developed than in France, and assumes a form more akin to the English township. But there were regions, *e.g.* Westphalia, where the population had settled in separate farms (*Hofsystem*), and where the communal solidarity was reduced to a union for administrative purposes and for the use of pasture.

It need hardly be added that every step in the direction of more active economic intercourse and more efficient public authority tended to lessen the influence of the manorial system in so far as the latter was based on the localization of government, natural husbandry and aristocratic authority.

See Fustel de Coulanges, *Histoire des institutions de la France*, especially the volumes "L'Alleu et le domaine rural" and "L'Invasion germanique"; Beaudouin, "Les Grands domaines dans l'empire romain" (*Nouvelle revue de droit français et étranger*, 1898); T. Flach, *Les Origines de l'ancienne France*, I., II., III. (1886); Paul Viollet, *Histoire des institutions de la France*, I., II. (1890, 1898); A. Luchaire, *Manuel des institutions françaises* (1892); G. Waitz, *Deutsche Verfassungsgeschichte*, I.-VIII. (1865-1883); K. T. von Inama-Sternegg, *Deutsche Wirtschaftsgeschichte*, I., II. (1879-1891); K. Lamprecht, *Deutsches Wirtschaftsleben*, I.-IV. (1885); A. Meitzen, *Ansiedelungen, Wanderungen und Agrarwesen der Völker Europas*, I.-IV. (1895 ff.); W. Wittich, *Die Grundherrschaft in Nordwestdeutschland* (1896); G. F. von Maurer, *Geschichte der Mark-, Dorf- und Hofverfassung in Deutschland*; and F. Seebohm, *The English Village Community* (1883).
(P. VI.)

The Manor in England.—It will be most convenient to describe a typical English manor in its best known period, the 13th century, and to indicate briefly the modifications of the type which varying conditions may produce. Topographically such a manor consisted partly of the houses of the inhabitants more or less closely clustered together, and surrounded by arable land divided into large fields, two or three in number. Each of these fields was divided again into shots or furlongs, and each of the shots was broken up into cultivated strips a pole wide, each containing an acre, separated by narrow balks of turf. There were also certain meadows for supplying hay; and beyond the cultivated land lay the wood and waste of the manor. Portions of arable or meadow land might be found apart from the organization of the remainder; the lord of the manor might have a park, and each householder a garden, but the land of the manor was the open fields, the meadows and the wastes or common. The condition of the inhabitants of such a manor is as complex as its geography. At the head of the society came the lord of the manor, with his hall, court, or manor-house, and the land

Rights of Lord and Tenants.

immediately about it, and his demesne both in the fields and in the meadow land. The arable demesne consisted of certain of the acre strips lying scattered over the various furlongs; his meadow was a portion assigned to him each year by the custom of the manor. He had also rights over the surrounding waste paramount to those enjoyed by the other inhabitants. Part of his demesne land would be granted out to free tenants to hold at a rent or by military or other service; part would be in the lord's own hands, and cultivated by him. Each part so granted out will carry with it a share in the meadow land and in the profits of the waste. These rights of the free tenants over the waste limited the lord's power over it. He could not by enclosure diminish their interest in it. The statute of Merton in 1236 and the second statute of Westminster in 1285 marked the utmost limit of enclosure allowed in the 13th century. Below the lord and the free tenants came the villeins, natives, bondmen, or holders of virgates or yard-lands, each holding a house, a fixed number of acre strips, a share of the meadow and of the profits of the waste. The number of strips so held was usually about thirty; but virgates of fifteen acres or even eighty are not unknown. In any one manor, however, the holdings of all the villeins were equal. Normally the holder of a virgate was unfree; he had no rights in the eye of the law against his lord, who was protected from all suits by the *exceptio villenagii*; he could not without leave quit the manor, and could be reclaimed by process of law if he did; the strict contention of law deprived him of all right to hold property; and in many cases he was subject to certain degrading incidents, such as *merchet* (*merchetum*), a payment due to the lord upon the marriage of a daughter, which was regarded as a special mark of unfree condition. But there are certain limitations to be made. Firstly, all these incidents of tenure, even merchet, might not affect the personal status of the tenant; he might still be free, though holding by an unfree tenure; secondly, even if unfree, he was not exposed to the arbitrary will of his lord but was protected by the custom of

Rights of Villeins.

the manor as interpreted by the manor court. Moreover, he was not a slave, he was not bought and sold apart from his holding. The hardship of his condition lay in the services due from him. As a rule a villein paid for his holding in money, in labour and in kind. In money he paid, firstly, a small fixed rent called rent of assize; and, secondly, dues under various names, partly in lieu of services commuted into money payments, and partly for the privileges and profits enjoyed by him on the waste of the manor. In labour he paid more heavily. Week by week he had to come with his own plough and oxen to plough the lord's demesne; when ploughing was done he had to harrow, to reap the crops, to thresh and carry them, or do whatever might be required of him, until his allotted number of days labour in the year was done. Beyond this his lord might request of him extra days in harvest or other seasons of emergency, and these requests could not be denied. Further, all the carriage of the manor was provided by the villeins, even to places as much as a hundred miles away from the manor. The mending of the ploughs, hedging, ditching, sheepshearing and other miscellaneous work also fell upon him, and it is sometimes hard to see what time remained to him to work upon his own holding. In kind he usually rendered honey, eggs, chickens and perhaps a ploughshare, but these payments were almost always small in value. Another class of inhabitants remains to be mentioned—the cotters. These are the poor of the manor, who hold a cottage and garden, or perhaps one acre or half an acre in the fields. They were unfree in condition, and in most manors their services were modelled upon those of the villeins. From their ranks were usually drawn the shepherd of the manor, the bee-keeper and other minor officials of the manor.

Cotters.

A complicated organization necessarily involves administrators. Just as the services of the tenants and even their names vary from manor to manor, so does the nature of the staff. Highest in rank came the steward; he was attached to no manor in particular, but controlled a group, travelling from

one to another to take accounts, to hold the courts, and generally represent the lord. Under him are the officers of the several manors.

Staff.

First came the bailiff or beadle, the representative of the lord in the manor; his duty was to collect the rents and services, to gather in the lord's crops and account for the receipts and expenditure of the manor. Closely connected with him was the "messor" or reaper; in many cases, indeed, "reaper" seems to have been only another name for the bailiff. But the villeins were not without their own officer, the provost or reeve. His duty was to arrange the distribution of the services due from the tenants, and, as their representative, to assist the bailiff in the management of the manor. Sometimes the same man appears to have united both offices, and we find the reeve accounting to the lord for the issues of the manor. To these important officials may be added a number of smaller ones, the shepherd, the swineherd, the bee-keeper, the cowherd, the ploughman and so on, mostly selected from the cotters, and occupying their small holdings by the services expressed in their titles. The number varies with the constitution and needs of each estate, and they are often replaced by hired labour.

The most complicated structure in the system is the manor court. The complication is, indeed, partly the work of lawyers interpreting institutions they did not understand by formulae not adapted to describe them. But beyond this there remain the facts that the court was the meeting-point of the lord and the tenants both free and unfree, that any question touching on the power and constitution of the court was bound to affect the interests of the lord and the tenants, and that there was no external power capable of settling such questions as did arise. Amid this maze a few clear lines can be laid down. In the first place, so far as the 13th century goes, all the discussion that has collected about the terms court leet, court baron and court customary may be put aside; it relates to questions which in the 13th century were only just

Manor Court.

emerging. The manor court at that date exercised its criminal, civil, or manorial jurisdiction as one court; its names may differ, the parties before it may be free or unfree, but the court is the same. Its president was the lord's steward; the bailiff was the lord's representative and the public prosecutor; and the tenants of the manor, both free and unfree, attended at the court and gave judgment in the cases brought before it. To modern ears the constitution sounds unfamiliar. The president of the court settled the procedure of the court, carried it out, and gave the final sentence, but over the law of the court he had no power. All that is comprised in the word "judgment" was settled by the body of tenants present at the court. This attendance was, indeed, compulsory, and absence subjected to a fine any tenant owing and refusing the service known as "suit of court." It may be asked who in these courts settled questions of fact. The answer must be that disputed questions of fact could only be settled in one way, by ordeal; and that in most manorial courts the method employed was the wager of law. The business of the court may be divided into criminal, manorial and civil. Its powers under the first head depended on the franchises enjoyed by the lord in the particular manor; for the most part only petty offences were triable, such as small thefts, breaches of the assize of bread and ale, assaults, and the like; except under special conditions, the justice of great offences remained in the king. But offences against the custom of the manor, such as bad ploughing, improper taking of wood from the lord's woods, and the like, were of course the staple criminal business of the court. Under the head of manorial business the court dealt with the choice of the manorial officers, and had some power of making regulations for the management of the manor; but its most important function was the recording of the surrenders and admittances of the villein tenants. Into the history and meaning of this form of land transfer it is not necessary to enter here. But it must be noted that the conveyance of a villein's holding was effected by the vendor surrendering his land to the lord, who thereupon admitted the purchaser to the holding. The same procedure was employed in all cases of transfer of land, and the transaction was

regularly recorded upon the rolls of the court among the records of all the other business transacted there. Finally, the court dealt with all suits as to land within the manor, questions of dower and inheritance, and with civil suits not connected with land. But it need hardly be said that in an ordinary rural manor very few of these would occur.

It will be clear on consideration that the manor court as here described consisted of conflicting elements of very different origin and history. Founded partly on express grants of franchises, partly on the inherent right of a feudal lord to hold a court for his free tenants, partly on the obscure community traceable among the unfree inhabitants of the manor, it is incapable of strict legal definition. All these elements, moreover, contain in themselves reasons for the decay which gradually came over the system. The history of the decay of the manorial jurisdictions in England has not yet been written. On the one hand were the king's courts, with new and improved processes of law; on the other hand the gradual disintegration which marks the history of the manor during the 14th and 15th centuries. The criminal jurisdiction was the first to disappear, and was closely followed by the civil jurisdiction over the free tenants; and in modern times all that is left is the jurisdiction over the customary tenants and their holdings, and that in an attenuated form.

A few words must be given to the legal theories of the 15th century on the manor court. It would seem to have become the law that to the existence of the manor two courts were necessary—a court customary for customary tenants, and a court baron for free tenants. In the court customary the lord's steward is the judge; in the court baron the freeholders are the judges. If the freeholders in the manor diminish to less than two in number the court baron cannot be held, and the manor perishes. Nor can it be revived by the grant of new freehold tenures, because under the statute of *Quia Emptores* such new freeholders would hold not of the lord of the manor, but of his lord. The customary tenants

and the court customary may survive, but the manor is only a reputed manor. Of the 13th century all this is untrue, but even at that date the existence of free tenants was in a measure essential to the existence of the manor court. If there were none the jurisdiction of the court over free tenants of course collapsed; but in addition to this the lord also lost his power of exercising the highest criminal franchises, even if he otherwise possessed them; he could, for instance, no longer hang a murderer on his own gallows. Perhaps it may be said that to the exercise of the feudal power and of the royal franchises the presence of free tenants was necessary. But it is clear that no such condition was necessary to the existence of the manor.

Apart from the change in the court of the manor, the most important thread in its history is the process which converted the villein into the copyholder. Here again the subject is imperfectly explored, and part of it is still subject to controversy. In the strict view of contemporary lawyers the holding of the villein tenant of the 13th century was at the will of the lord, and the king's courts of law would not protect him in his possession. If, however, the villein were a tenant on the king's ancient demesne his condition was improved. The writs of *monstraverunt* and the little writ of right close protected him from the improper exaction of services and from ejection by the lord. But in ordinary manors there was no such immunity. That ejection was common cannot be believed, but it was legally possible; and it was not until the well-known decision of Danby, C. J., and Bryan, C. J., in 7 Edw. IV., that the courts of law would entertain an action of trespass brought against his lord by a customary tenant. From that date the courts, both of law and equity, begin to intervene; and the records of the Courts of Star Chamber and Requests show that in the Tudor period equitable suits brought by tenants against their lords are not infrequent. Side by side with the alteration in the legal condition of the manor there went on an economic

change. The labour rents and other services slowly disappeared, and were replaced by money payments. The field divisions gave way before inclosures, effected sometimes by the lords and sometimes by the tenants. Change in legal and agricultural practice went on side by side, and finally the manor ceased to be an important social form, and became only a peculiar form of land tenure and the abode of antiquarian curiosities.

See G. L. von Maurer, *Einleitung in die Geschichte der Hof-, Mark-, Dorf- und Stadtverfassung in Deutschland* (Erlangen, 1856); G. Nasse, *Zur Geschichte der mittelälterlichen Feldgemeinschaft in England* (Bonn, 1869); H. S. Maine, *Village Communities in the East and West* (Cambridge, 1872); F. Seebohm, *The English Village Community* (1883); W. J. Ashley, *English Economic History*, pts. i. ii. (1888-1893); F. W. Maitland, *Select Pleas in Manorial Courts* (London, Selden Society, 1888); P. Vinogradoff, *Villainage in England* (Cambridge, 1892); *The Growth of the Manor* (1905) and *English Society in the 11th Century* (1908); A. Meitzen, *Siedelung und Agrarwesen der Westgermanen und Ostgermanen* (Berlin, 1896); W. Cunningham, *Growth of English Industry and Commerce* (Cambridge, 1896); F. Pollock and F. W. Maitland, *History of English Law* (Cambridge, 1896); F. W. Maitland, *Doomsday Book and Beyond* (Cambridge, 1897); and C. M. Andrews, *The Old English Manor* (1892).

(C. G. Cr.)

MANOR-HOUSE (Lat. *manerium*; Fr. *manoir*), in architecture, the name given to the dwelling-house of the lord of the manor. The manor-house was generally arranged for defence against robbers and thieves and was often surrounded by a moat with drawbridge, but was not provided with a keep or with towers or lofty curtain walls so as to stand a siege. The early buildings were comparatively small, square in plan, comprising a hall with one or two adjacent chambers; at a later period wings were added, thus forming three sides of a quadrangle, like the house designed by John Thorpe as his residence, the plan of which is among his drawings in the Soane Museum. One of the most ancient examples is the manor-house built by Richard Cœur de Lion at Southampton as a rendezvous when he was about to cross into France. This consisted of a hall and chapel on the first floor, with cellars on the ground floor; the walls of this structure, with the chimney-piece, are still in existence. The distinction between the "manor-house" and "castle" is not always very clearly defined; in France such buildings as the castles of Aydon (Northumberland) and of Stokesay (Shropshire) would be regarded as manor-houses in that they were built as country houses and not as fortresses, like Coucy and Pierrefonds; some of the smaller castles in France were, in the 16th century, transformed into manor-houses by the introduction of windows on the second floors of their towers and the partial destruction of their curtain walls, as in the manor-houses of Sedières (Corrèze), Nantouillet and Compiègne; and in the same century, as at Chenonceaux, Blois and Chambord, though angle towers and machicolated parapets still formed part of the design, they were considered to be purely decorative features. The same is found in England; thus in Thornbury and Hurstmonceaux castles, and in Cowdray House, the fortifications were more for show than for use. There is an interesting example of a French manor-house near Dieppe, known as the Manoir-d'Ango, built in 1525, of which a great portion still exists, where the proprietor Ango received François I., so that it must have been of considerable size.

In England the principal examples of which remains exist are the manor-houses of Appleton, Berkshire, with a moat; King John's house at Warnford (Hampshire); Boothby Ragnell, Lincolnshire, with traces of moat; Godmersham, Kent; Little Wenham Hall, Suffolk, built partly in brick and flint, and one of the earliest in which the bricks, probably imported from Flanders, are found; Charney Hall, Berkshire (T-shaped in plan in two storeys); Longthorpe House, near Peterborough; Stokesay, Shropshire, already referred to; Cottesford, Oxfordshire; Woodcraft, Northamptonshire; Acton Burnell, Shropshire; Old Soar, Plaxtol, Kent, in two storeys, the ground storey vaulted and used as cellar and storehouse, and the upper floor with hall, solar and chapel. The foundation of all these dates from the 13th century. Ightham Mote, Kent, portions of which, with the moat, date from the 14th century, is one of the best preserved manor-houses; then follow Norborough Hall, Northamptonshire; Creslow manor-house, Bucks, with moat; Sutton Courtenay, Berkshire; the Court Lodge, Great Chart, Kent; Stanton St Quentin, Great Chalfield, and South Wraxhall, all in Wilts; Meare manor-house, Somerset; Ockwell, Berks; Kingfield manor-house, Derbyshire; Kirby Muxloe, Leicestershire; Stoke Albany, Northamptonshire; and, in the 16th century, Large Marney Hall, Essex (1520); Sutton Place, Surrey (1530); the Vyne, Hampshire, already influenced by the first Renaissance. In the 17th and 18th centuries the manor-house is generally rectangular in plan, and, though well and solidly built, would seem to have been erected more with a view to internal comfort than to exterior embellishments. There is one other type of manor-house, which partakes of the character of the castle in its design, and takes the form of a tower, rectangular or square, with angle turrets and in several storeys; in France it is represented by the manor-houses of St Medard near Bordeaux and Camarsae (Dordogne), and in England by Tattershall Castle, Lincolnshire and Middleton Tower, Norfolk, both being in brick.

(R. P. S.)

MANRESA, a town of north-eastern Spain, in the province of Barcelona, on the river Cardoner and the Barcelona-Lérida railway. Pop. (1900), 23,252. Manresa is the chief town of the highlands watered by the Cardoner and upper Llobregat, which meet below the town, and are also connected by a canal 18 m. long. Two bridges, one built of stone and dating from the Roman period, the other constructed of iron in 1804, unite the older and larger part of Manresa with the modern suburbs on the right bank of the river. The principal buildings are the collegiate church of Santa Maria de la Séo, the Dominican monastery, and the church of San Ignazio, built over the cavern (*cueva santa*) where Ignatius de Loyola spent most of the year 1522 in penitentiary exercises and the composition of his *Exercitia spiritualia*. Santa Maria is a fine example of Spanish Gothic, and consists, like many Catalan churches, of nave and chancel, aisles and ambulatory, without transepts. One of its chief treasures is an exquisite 15th-century Florentine altar-frontal, preserved in the sacristy. The Dominican monastery, adjoining the *cueva santa*, commands a magnificent view of the Montserrat (*q.v.*), and is used for the accommodation of the pilgrims who yearly visit the cavern in thousands. Manresa has important iron-foundries and manufactures of woollen, cotton and linen goods, ribbons, hats, paper, soap, chemicals, spirits and flour. Building-stone is quarried near the town.

Manresa is probably the *Munorisa* of the Romans, which was the capital of the Jacetani or Jaccetani, an important tribe of the south-eastern Pyrenees.

A large portion of the town was burned by the French in 1811.

MANRIQUE, GÓMEZ (1412?-1490?), Spanish poet, soldier, politician and dramatist, was born at Amusco. The fifth son of Pedro Manrique, *adelantado mayor* of León, and nephew of Santillana (*q.v.*), Gómez Manrique was introduced into public life at an early age, took a prominent part against the constable Álvaro de Luna during the reign of John II., went into opposition against Miguel Lucas de Iranzo in the reign of Henry IV., and declared in favour of the infanta Isabel, whose marriage with Ferdinand he promoted. Besides being a distinguished soldier, he acted as a moderating political influence and, when appointed *corregidor* of Toledo, was active in protecting the converted Jews from popular resentment. His will was signed on the 31st of May 1490, and he is known to have died before the 16th of February 1491. He inherited the literary taste of his uncle Santillana, and was greatly esteemed in his own age; but his reputation was afterwards eclipsed by that of his nephew Jorge Manrique (*q.v.*), whose *Coplas* were continually reproduced. Gómez Manrique's poems were not printed till 1885, when they were edited by Antonio Paz y Melia. They at once revealed him to be a poet of eminent merit, and it seems certain that his *Consejos*, addressed to Diego Arias de Avila, inspired the more famous *Coplas* of his nephew. His didactic verses are modelled upon those of Santillana, and his satires are somewhat coarse in thought and expression; but his place in the history of Spanish literature is secure as the earliest Spanish dramatist whose name has reached posterity. He wrote the

Representación del nascimiento de Nuestro Señor, a play on the Passion, and two *momos*, or interludes, played at court.

MANRIQUE, JORGE (1440?-1478), Spanish poet and soldier, was born probably at Paredes de Nava. The fourth son of Rodrigo Manrique, count de Paredes, he became like the rest of his family a fervent partisan of Queen Isabel, served with great distinction in many engagements, and was made *comendador* of Montizón in the order of Santiago. He was killed in a skirmish near the fortress of Garci-Muñoz in 1478, and was buried in the church attached to the convent of Uclés. His love-songs, satires, and acrostic verses are merely ingenious compositions in the taste of his age; he owes his imperishable renown to a single poem, the *Coplas por la muerte de su padre*, an elegy of forty stanzas on the death of his father, which was apparently first printed in the *Cancionero llamado de Fray Inigo de Mendoza* about the year 1482. There is no foundation for the theory that Manrique drew his inspiration from an Arabic poem by Abu ‘l-Bakā Sālih ar-Rundi; the form of the *Coplas* is influenced by the *Consejos* of his uncle, Gómez Manrique, and the matter derives from the Bible, from Boethius and from other sources readily accessible. The great sonorous commonplaces on death are vitalized by the intensely personal grief of the poet, who lent a new solemnity and significance to thoughts which had been for centuries the common property of mankind. It was given to Jorge Manrique to have one single moment of sublime expression, and this isolated achievement has won him a fame undimmed by any change of taste during four centuries.

The best edition of the *Coplas* is that issued by R. Foulché-Delbosc in the *Bibliotheca hispanica*; the poem has been admirably translated by Longfellow. Manrique's other verses were mostly printed in Hernando del Castillo's *Cancionero general* (1511).

MANSE (Med. Lat. *mansa*, *mansus* or *mansum*, from *manere*, to dwell, remain), originally a dwelling-house together with a portion of land sufficient for the support of a family. It is defined by Du Cange (*Glossarium, s.v. Mansus*) as *... certam agri portionem quae coleretur et in qua coloni aedes esset*. The term was particularly applied, in ecclesiastical law, to the house and glebe to which every church was entitled by common right, the rule of canon law being *sancitum est ut unicuique ecclesiae unus mansus integer absque ullo servitio tribuatur* (Phillimore, *Eccles. Law*, 1895, ii. 1125). The word is now chiefly used for the residence of a minister of the Established Church of Scotland; to this every minister of a rural parish is entitled, and the landed proprietors must build and keep it up. "Manse" is also loosely used for the residence of a minister of various Free Church denominations (see GLEBE).

MANSEL, HENRY LONGUEVILLE (1820-1871), English philosopher, was born at Cosgrove, Northamptonshire (where his father, also Henry Longueville Mansel, fourth son of General John Mansel, was rector), on the 6th of October 1820. He was educated at Merchant Taylors' School and St John's College, Oxford. He took a double first in 1843, and became tutor of his college. He was appointed reader in moral and metaphysical philosophy at Magdalen College in 1855, and Waynflete professor in 1859. He was a great opponent of university reform and of the Hegelianism which was then beginning to take root in Oxford. In 1867 he succeeded A. P. Stanley as professor of ecclesiastical history, and in 1868 he was appointed dean of St Paul's. He died on the 31st of July 1871.

The philosophy of Mansel, like that of Sir William Hamilton, was mainly due to Aristotle, Kant and Reid. Like Hamilton, Mansel maintained the purely formal character of logic, the duality of consciousness as testifying to both self and the external world, and the limitation of knowledge to the finite and "conditioned." His doctrines were developed in his edition of Aldrich's *Artis logicae rudimenta* (1849)—his chief contribution to the reviving study of Aristotle—and in his *Prolegomena logica: an Inquiry into the Psychological Character of Logical Processes* (1851, 2nd ed. enlarged 1862), in which the limits of logic as the "science of formal thinking" are rigorously determined. In his Bampton lectures on *The Limits of Religious Thought* (1858, 5th ed. 1867; Danish trans. 1888) he applied to Christian theology the metaphysical agnosticism which seemed to result from Kant's

criticism, and which had been developed in Hamilton's *Philosophy of the Unconditioned*. While denying all knowledge of the supersensuous, Mansel deviated from Kant in contending that cognition of the ego as it really is is itself a fact of experience. Consciousness, he held—agreeing thus with the doctrine of "natural realism" which Hamilton developed from Reid—implies knowledge both of self and of the external world. The latter Mansel's psychology reduces to consciousness of our organism as extended; with the former is given consciousness of free will and moral obligation. A summary of his philosophy is contained in his article "Metaphysics" in the 8th edition of the *Encyclopaedia Britannica* (separately published, 1860). Mansel wrote also *The Philosophy of the Conditioned* (1866) in reply to Mill's criticism of Hamilton; *Letters, Lectures, and Reviews* (ed. Chandler, 1873), and *The Gnostic Heresies* (ed. J. B. Lightfoot, 1875, with a biographical sketch by Lord Carnarvon). He wrote a commentary on the first two gospels in the *Speaker's Commentary*.

See J. W. Burgon, *Lives of Twelve Good Men* (1888-1889); James Martineau, *Essays, Reviews and Addresses* (London, 1891), iii. 117 seq.; A. W. Benn, *History of Rationalism* (1906), ii. 100-112; Masson, *Recent British Philosophy* (3rd ed., London, 1877), pp. 252 seq.; Sir Leslie Stephen in *Dict. Nat. Biog.*

MANSFELD, the name of an old and illustrious German family which took its name from Mansfeld in Saxony, where it was seated from the 11th to the 18th century. One of its earliest members was Hoyer von

Mansfeld (d. 1115), a partisan of the emperor Henry V. during his struggles with the Saxons; he fought for Henry at Warnstädt and was killed in his service at Welfesholz. Still more famous was Albert, count of Mansfeld (1480-1560), an intimate friend of Luther and one of the earliest and staunchest supporters of the Reformation. He helped to crush the rising of the peasants under Thomas Munzer in Thuringia in 1525; he was a member of the league of Schmalkalden, and took part in all the movements of the Protestants against Charles V. With Albert was associated his brother Gebhard, and another member of the family was Johann Gebhard, elector of Cologne from 1558 to 1562. A scion of another branch of the Mansfelds was Peter Ernst, Fürst von Mansfeld (1517-1604), governor of Luxemburg, who unlike his kinsmen was loyal to Charles V. He went with the emperor to Tunis and fought for him in France. He was equally loyal to his son, Philip II. of Spain, whom he served at St Quentin and in the Netherlands. He distinguished himself in the field and found time to lead a body of troops to aid the king of France against the Huguenots. In this capacity he was present in 1569 at the battle of Moncontour, where another member of his family, Count Wolrad of Mansfeld (d. 1578) was among the Huguenot leaders. The Mansfeld family became extinct in 1780 on the death of Josef Wenzel Nepomuk, prince of Fondi, the lands being divided between Saxony and Prussia.

See L. F. Niemann, *Geschichte der Grafen von Mansfeld* (Aschersleben, 1834).

MANSFELD, ERNST, Graf von (*c.* 1580-1626), German soldier, was an illegitimate son of Peter Ernst, Fürst von Mansfeld, and passed his early years in his father's palace at Luxemburg. He gained his earliest military experiences in Hungary, where his half-brother Charles (1543-1595,) also a soldier of renown, held a high command in the imperial army. Later he served under the Archduke Leopold, until that prince's ingratitude, real or fancied, drove him into the arms of the enemies of the house of Habsburg. Although remaining a Roman Catholic he allied himself with the Protestant princes, and during the earlier part of the Thirty Years' War he was one of their foremost champions. He was despatched by Charles Emmanuel, duke of Savoy, at the head of about 2000 men to aid the revolting Bohemians when war broke out in 1618. He took Pilsen, but in the summer of 1619 he was defeated at Zablat; after this he offered his services to the emperor Ferdinand II. and remained inactive while the titular king of Bohemia, Frederick V., elector palatine of the Rhine, was driven in headlong rout from Prague. Mansfeld, however, was soon appointed by Frederick to command his army in Bohemia, and in 1621 he took up his position in the Upper Palatinate, successfully resisting the efforts made by Tilly to dislodge him. From the Upper he passed into the Rhenish Palatinate. Here he relieved Frankenthal and took Hagenau; then, joined by his master, the elector Frederick, he defeated Tilly at Wiesloch in April 1622 and plundered Alsace and Hesse. But Mansfeld's ravages were not confined to the lands of his enemies; they were ruinous to the districts he was commissioned to defend. At length Frederick was obliged to dismiss Mansfeld's troops from his service. Then joining Christian of Brunswick the count led his army through Lorraine, devastating the country as he went, and in August 1622 defeating the Spaniards at Fleurus. He next entered the service of the United Provinces and took up his quarters in East Friesland, capturing fortresses and inflicting great hardships upon the inhabitants. A mercenary and a leader of mercenaries, Mansfeld often interrupted his campaigns by journeys made for the purpose of raising money, or in other words of selling his services to the

highest bidder, and in these diplomatic matters he showed considerable skill. About 1624 he paid three visits to London, where he was hailed as a hero by the populace, and at least one to Paris. James I. was anxious to furnish him with men and money for the recovery of the palatinate, but it was not until January 1625 that Mansfeld and his army of "raw and poor rascals" sailed from Dover to the Netherlands. Later in the year, the Thirty Years' War having been renewed under the leadership of Christian IV., king of Denmark, he re-entered Germany to take part therein. But on the 25th of April 1626 Wallenstein inflicted a severe defeat upon him at the bridge of Dessau. Mansfeld, however, quickly raised another army, with which he intended to attack the hereditary lands of the house of Austria, and pursued by Wallenstein he pressed forward towards Hungary, where he hoped to accomplish his purpose by the aid of Bethlem Gabor, prince of Transylvania. But when Gabor changed his policy and made peace with the emperor, Mansfeld was compelled to disband his troops. He set out for Venice, but when he reached Rakowitza he was taken ill, and here he died on the 29th of November 1626. He was buried at Spalato.

See F. Stieve, *Ernst von Mansfeld* (Munich, 1890); R. Reuss, *Graf Ernst von Mansfeld im böhmischen Kriege* (Brunswick, 1865); A. C. de Villermont, *Ernest de Mansfeldt* (Brussels, 1866); L. Graf Uetterodt zu Schaffenberg, *Ernst Graf zu Mansfeld* (Gotha, 1867); J. Grossmann, *Des Grafen Ernst von Mansfeld letzte Pläne und Thaten* (Breslau, 1870); E. Fischer, *Des Mansfelders Tod* (Berlin, 1873); S. R. Gardiner, *History of England*, vols. iv. and v. (1901); J. L. Motley, *Life and Death of John of Barneveld* (ed. 1904; vol. ii.).

MANSFIELD, RICHARD (1857-1907), American actor, was born on the 24th of May 1857, in Berlin, his mother being Madame [Erminia] Rudersdorff (1822-1882), the singer, and his father, Maurice Mansfield (d. 1861), a London wine merchant. He first appeared on the stage at St George's Hall, London, and then drifted into light opera, playing the Major-General in *The Pirates of Penzance*, and the Lord High Executioner in *The Mikado*, both in the English provinces and in America. In 1883 he joined A. M. Palmer's Union Square theatre company in New York, and made a great hit as Baron Chevrial in *A Parisian Romance*. He appeared successfully in several plays adapted from well-known stories, and his rendering (1887) of the doubled title-parts in R. L. Stevenson's *Strange Case of Dr Jekyll and Mr Hyde* created a profound impression. It was with this play that he made his London reputation during a season (1888) at the Lyceum theatre, by invitation of Henry Irving. He produced Richard III. the next year at the Globe. Among his other chief successes were *Prince Karl*, *Cyrano de Bergerac* and *Monsieur Beaucaire*. He was one of the earliest to produce G. Bernard Shaw's plays in America, appearing in 1894 as Bluntschli in *Arms and the Man*, and as Dick Dudgeon in *The Devil's Disciple* in 1897. As a manager and producer of plays Mansfield was remarkable for his lavish staging. He died in New London, Connecticut, on the 30th of August 1907.

See the lives by Paul Wilstach (1908) and William Winter (1910).

MANSFIELD, WILLIAM MURRAY, 1st Earl of

(1705-1793), English judge, was born at Scone in Perthshire, on the 2nd of March 1705. He was a younger son of David Murray, 5th Viscount Stormont (*c.* 1665-1731), the dignity having been granted in 1621 by James I. to his friend and helper, Sir David Murray (d. 1631), a Scottish politician of some note. Lord Stormont's family was Jacobite in its politics, and his second son James (*c.* 1690-1728), being apparently mixed up in some of the plots of the time, joined the court of the exiled Stuarts and in 1721 was created earl of Dunbar by James Edward, the Old Pretender.

William Murray was educated at Perth grammar school and Westminster School, of which he was a king's scholar. Entering Christ Church, Oxford, he graduated in 1727. A friend of the family, Lord Foley, provided the funds for his legal training, and he became a member of Lincoln's Inn on his departure from Oxford, being called to the bar in 1730. He was a good scholar and mixed with the best literary society, being an intimate friend of Alexander Pope. His appearance in some important Scottish appeal cases brought him into notice, and in Scotland at least he acquired an immense reputation by his appearance for the city of Edinburgh when it was threatened with disfranchisement for the affair of the Porteous mob. His English practice had as yet been scanty, but in 1737 a single speech in a jury trial of note placed him at the head of the bar, and from this time he had all he could attend to. In 1738 he married Lady Elizabeth Finch, daughter of the earl of Winchelsea. His political career began in 1742 with his appointment

as solicitor-general. During the next fourteen years he was one of the most conspicuous figures in the parliamentary history of the time. By birth a Jacobite, by association a Tory, he was nevertheless a Moderate, and his politics were really dominated by his legal interests. Although holding an office of subordinate rank, he was the chief defender of the government in the House of Commons, and during the time that Pitt was in opposition had to bear the brunt of his attacks. In 1754 he became attorney-general, and for the next two years acted as leader of the House of Commons under the administration of the duke of Newcastle. But in 1756, when the government was evidently approaching its fall, an unexpected vacancy occurred in the chief justiceship of the king's bench, and he claimed the office, being at the same time raised to the peerage as Baron Mansfield.

From this time the chief interest of his career lies in his judicial work, but he did not wholly dissever himself from politics. He became by a singular arrangement, only repeated in the case of Lord Ellenborough, a member of the cabinet, and remained in that position through various changes of administration for nearly fifteen years, and, although he persistently refused the chancellorship, he acted as Speaker of the House of Lords while the Great Seal was in commission. During the time of Pitt's ascendancy he took but little part in politics, but while Lord Bute was in power his influence was very considerable, and seems mostly to have been exerted in favour of a more moderate line of policy. He was on the whole a supporter of the prerogative, but within definite limits. Macaulay terms him, justly enough, "the father of modern Toryism, of Toryism modified to suit an order of things in which the House of Commons is the most powerful body in the state." During the stormy session of 1770 he came into violent collision with Chatham and Camden in the questions that arose out of the Middlesex election and the trials for political libel; and in the subsequent years he was made the subject of the bitter attacks of Junius, in which his early Jacobite connexions, and his apparent leanings to arbitrary power, were used against

him with extraordinary ability and virulence. In 1776 he was created earl of Mansfield. In 1783, although he declined to re-enter the cabinet, he acted as Speaker of the House of Lords during the coalition ministry, and with this his political career may be said to have closed. He continued to act as chief justice until his resignation in June 1788, and after five years spent in retirement died on the 20th of March 1793. He left no family, but his title had been re-granted in 1792 with a direct remainder to his nephew David Murray, 7th Viscount Stormont (1727-1796). The 2nd earl was ambassador to Vienna and then to Paris; he was secretary of state for the southern department from 1779 to 1782, and lord president of the council in 1783, and again from 1794 until his death. In 1906 his descendant Alan David Murray (b. 1864) became 6th earl of Mansfield.

Lord Mansfield's great reputation rests chiefly on his judicial career. The political trials over which he presided, although they gave rise to numerous accusations against him, were conducted with singular fairness and propriety. He was accused with especial bitterness of favouring arbitrary power by the law which he laid down in the trials for libel which arose out of the publications of Junius and Horne Tooke, and which at a later time he reaffirmed in the case of the dean of St Asaph (see LIBEL). But we must remember that his view of the law was concurred in by the great majority of the judges and lawyers of that time, and was supported by undoubted precedents. In other instances, when the government was equally concerned, he was wholly free from suspicion. He supported Lord Camden's decision against general warrants, and reversed the outlawry of Wilkes. He was always ready to protect the rights of conscience, whether they were claimed by Dissenters or Catholics, and the popular fury which led to the destruction of his house during the Gordon riots was mainly due to the fact that a Catholic priest, who was accused of saying Mass, had escaped the penal laws by his charge to the jury. His chief celebrity, however, is founded upon the consummate ability with which he discharged the civil duties of his

office. He has always been recognized as the founder of English mercantile law. The common law as it existed before his time was wholly inadequate to cope with the new cases and customs which arose with the increasing development of commerce. The facts were left to the jury to decide as best they might, and no principle was ever extracted from them which might serve as a guide in subsequent cases. Mansfield found the law in this chaotic state, and left it in a form that was almost equivalent to a code. He defined almost every principle that governed commercial transactions in such a manner that his successors had only to apply the rules he had laid down. His knowledge of Roman and foreign law, and the general width of his education, freed him from the danger of relying too exclusively upon narrow precedents, and afforded him a storehouse of principles and illustrations, while the grasp and acuteness of his intellect enabled him to put his judgments in a form which almost always commanded assent. A similar influence was exerted by him in other branches of the common law; and although, after his retirement, a reaction took place, and he was regarded for a while as one who had corrupted the ancient principles of English law, these prejudices passed rapidly away, and the value of his work in bringing the older law into harmony with the needs of modern society has long been fully recognized.

See Holliday's *Life* (1797); Campbell's *Chief Justices*; Foss's *Judges*; Greville's *Memoirs, passim*; Horace Walpole's *Letters*; and other memoirs and works on the period.

MANSFIELD, a market town and municipal borough in the Mansfield parliamentary division of Nottinghamshire, England, on the small river Mann or Maun; the junction of several branches of the Midland railway, by which it is 142 m. N.N.W. from London. Pop. (1891), 13,094; (1901), 15,250. Area, 7068 acres. The church of St Peter is partly Early Norman, and partly Perpendicular. There is a grammar school founded by Queen Elizabeth in 1561, occupying modern buildings. Twelve almshouses were founded by Elizabeth Heath in 1693, and to these six were afterwards added. There are a number of other charities. The industries are the manufacture of lace, thread, boots and machinery, iron-founding and brewing. In the neighbourhood, as at Mansfield Woodhouse to the north, there are quarries of limestone, sandstone and freestone. The town is governed by a mayor, 6 aldermen and 18 councillors. During the heptarchy Mansfield was occasionally the residence of the Mercian kings, and it was afterwards a favourite resort of Norman sovereigns, lying as it does on the western outskirts of Sherwood Forest. By Henry VIII. the manor was granted to the earl of Surrey. Afterwards it went by exchange to the duke of Newcastle, and thence to the Portland family. The town obtained a fair from Richard II. in 1377. It became a municipal borough in 1891.

MANSFIELD, a city and the county-seat of Richland county, Ohio, U.S.A., about 65 m. S.W. of Cleveland. Pop. (1890), 13,473; (1900), 17,640, of whom 1781 were foreign-born; (1910 census), 20,768. It is served by the Pennsylvania (Pittsburg, Ft Wayne & Chicago division), the Erie, and the

Baltimore & Ohio railways. It is built on an eminence (1150 ft.), and has two public parks, a substantial court-house, a soldiers' and sailors' memorial building, a public library, a hospital and many fine residences. It is the seat of the Ohio state reformatory. Mansfield has an extensive trade with the surrounding agricultural country, but its largest interests are in manufactures. The total factory product in 1905 was valued at $7,353,578. There are natural gas wells in the vicinity. The waterworks and the sewage disposal plant are owned and operated by the municipality. Mansfield was laid out in 1808, and was named in honour of Lieut.-Colonel Jared Mansfield (1759-1830), United States surveyor of Ohio and the North-west Territory in 1803-1812, and professor of natural and experimental philosophy at West Point from 1812 to 1828. Mansfield was incorporated as a village in 1828 and was first chartered as a city in 1857. It was the home of John Sherman from 1840 until his death.

MANSION (through O. Fr. *mansion*, mod. *maison*, from Lat. *mansio*, dwelling-place, stage on a journey; *manere*, to remain), a term applied in early English use to the principal house of the lord of a manor. By the Settled Land Act 1890, § 10, subsec. 2, repealing § 15 of the act of 1882, "the principal mansion house ... on any settled land shall not be sold or exchanged or leased by the tenant for life without the consent of the trustees of the settlement or an order of the court." The principles guiding an English court of law for making or refusing such an order are laid down in *In re the Marquess of Ailesbury's Settled Estate* (1892), 1 Ch. 506, 546; A.C. 356. In

general usage, the term “mansion” is given to any large and important house in town or country; and “mansion house” to the official residence, when provided, of the mayor of a borough, particularly to that of the lord mayors of London and Dublin. From the general meaning of a conspicuously large dwelling-place comes the modern employment of the term “mansions,” in London and elsewhere, for large buildings composed of “flats.”

MANSLAUGHTER (O. Eng., *mannslaeht*, from *mann*, man, and *slaeht*, act of slaying, *sleán*, to slay, properly to smite; cf. Ger. *schlagen*, *Schlacht*, battle), a term in English law signifying “unlawful homicide without malice aforethought” (Stephen, *Digest of the Criminal Law*, Art. 223). The distinction between manslaughter and murder and other forms of homicide is treated under HOMICIDE.

MANSON, GEORGE (1850-1876), Scottish water-colour painter, was born in Edinburgh on the 3rd of December 1850. When about fifteen he was apprenticed as a woodcutter with W. & R. Chambers, with whom he remained for over five years, diligently employing all his spare

time in the study and practice of art, and producing in his morning and evening hours water-colours of much delicacy and beauty. In 1871 he devoted himself exclusively to painting. His subjects were derived from humble Scottish life—especially child-life, varied occasionally by portraiture, by landscape, and by views of picturesque architecture. In 1873 he visited Normandy, Belgium and Holland; in the following year he spent several months in Sark; and in 1875 he resided at St Lô, and in Paris, where he mastered the processes of etching. Meanwhile in his water-colour work he had been adding more of breadth and power to the tenderness and richness of colour which distinguished his early pictures, and he was planning more complex and important subjects. But his health had been gradually failing, and he was ordered to Lympstone in Devonshire, where he died on the 27th of February 1876.

A volume of photographs from his water-colours and sketches, with a memoir by J. M. Gray, was published in 1880. For an account of Manson's technical method as a wood engraver see P. G. Hamerton's *Graphic Arts*, p. 311.

MANṢŪR (Arab. "victorious"), a surname (*laqab*) assumed by a large number of Mahommedan princes. The best known are: (1) ABŪ JA'FAR IBN MAHOMMED, second caliph of the Abbasid house, who reigned A.D. 754-775 (see CALIPHATE: § C, §2); (2) ABŪ TĀHIR ISMA'IL IBN AL-QĀIM, the third Fatimite caliph of Africa (946-953) (see FATIMITES); (3) ABŪ YŪSUF YA 'QŪB IBN YŪSUF, often described as Jacob Almanzor, of the Moorish dynasty of

the Almohades, conqueror of Alfonso III. in the battle of Alarcos (1195); (4) Ibn Abī ʻĀmir Mahommed, commonly called Almanzor by European writers, of an ancient but not illustrious Arab family, which had its seat at Torrox near Algeciras. The last-named was born A.D. 939, and began life as a lawyer at Cordova. In 967 he obtained a place at the court of Ḥakam II., the Andalusian caliph, and by an unusual combination of the talents of a courtier with administrative ability rapidly rose to distinction, enjoying the powerful support of Ṣubḥ, the favourite of the caliph and mother of his heir Hishām. The death of Ḥakam (976) and the accession of a minor gave fresh scope to his genius, and in 978 he became chief minister. The weak young caliph was absorbed in exercises of piety, but at first Manṣūr had to share the power with his father-in-law Ghālib, the best general of Andalusia, and with the mother of Hishām. At last a rupture took place between the two ministers. Ghālib professed himself the champion of the caliph and called in the aid of the Christians of Leon; but Manṣūr, anticipating the struggle, had long before remodelled the army and secured its support. Ghālib fell in battle (981); a victorious campaign chastised the Leonese; and on his return to Cordova the victor assumed his regal surname of *al-Manṣūr billah*, and became practically sovereign of Andalusia. The caliph was a mere prisoner of state, and Manṣūr ultimately assumed the title as well as the prerogatives of king (996). Unscrupulous in the means by which he rose to power, he wielded the sovereignty nobly. His strict justice and enlightened administration were not less notable than the military prowess by which he is best known. His arms were the terror of the Christians, and raised the Moslem power in Spain to a pitch it had never before attained. In Africa his armies were for a time hard pressed by the revolt of Zīrī, viceroy of Mauretania, but before his death this enemy had also fallen. Mansūr died at Medinaceli on the 10th of August 1002, and was succeeded by his son Mozaffar.

MANSURA, the capital of the province of Dakahlia, Lower Egypt, near the west side of Lake Menzala, and on the Cairo-Damietta railway. Pop. (1907), 40,279. It dates from 1221, and is famous as the scene of the battle of Mansura, fought on the 8th of February 1250, between the crusaders commanded by the king of France, St Louis, and the Egyptians. The battle was drawn, but it led to the retreat of the crusaders on Damietta, and to the surrender of St Louis. Mansura has several cotton-ginning, cotton, linen and sail-cloth factories.

MANT, RICHARD (1776-1848), English divine, was born at Southampton on the 12th of February 1776, and was educated at Winchester and Trinity College, Oxford. He was elected fellow of Oriel in 1798, and after taking orders held a curacy at Southampton (1802), and then the vicarage of Coggeshall, Essex (1810). In 1811 he was Bampton lecturer, in 1816 was made rector of St Botolph's, and in 1820 bishop of Killaloe and Kilfenoragh (Ireland). In 1823 he was translated to Down and Connor, to which Dromore was added in 1842. In connexion with the Rev. George

D'Oyly he wrote a commentary on the whole Bible. Other works by him were the *Psalms in an English Metrical Version* (1842) and a *History of the Church of Ireland* (1839-1841; 2 vols.).

MANTEGAZZA, PAOLO (1831-1910), Italian physiologist and anthropologist, was born at Monza on the 31st of October 1831. After spending his student-days at the universities of Pisa and Milan, he gained his M.D. degree at Pavia in 1854. After travelling in Europe, India and America, he practised as a doctor in the Argentine Republic and Paraguay. Returning to Italy in 1858 he was appointed surgeon at Milan Hospital and professor of general pathology at Pavia. In 1870 he was nominated professor of anthropology at the Instituto di Studii Superiori, Florence. Here he founded the first Museum of Anthropology and Ethnology in Italy, and later the Italian Anthropological Society. From 1865 to 1876 he was deputy for Monza in the Italian parliament, subsequently being elected to the senate. He became the object of bitter attacks on the ground of the extent to which he carried the practice of vivisection. His published works include *Fisiologia del dolore* (1880); *Fisiologia dell' amore* (1896); *Elementi d' igiene* (1875); *Fisonomia e mimica* (1883); *Le Estasi umane* (1887).

MANTEGNA, ANDREA (1431-1506), one of the chief heroes in the advance of painting in Italy, was born in Vicenza, of very humble parentage. It is said that in his earliest boyhood Andrea was, like Giotto, put to shepherding or cattle-herding; this is not likely, and can at any rate have lasted only a very short while, as his natural genius for art developed with singular precocity, and excited the attention of Francesco Squarcione, who entered him in the gild of painters before he had completed his eleventh year.

Squarcione, whose original vocation was tailoring, appears to have had a remarkable enthusiasm for ancient art, and a proportionate faculty for acting, with profit to himself and others, as a sort of artistic middleman; his own performances as a painter were merely mediocre. He travelled in Italy, and perhaps in Greece also, collecting antique statues, reliefs, vases, &c., forming the largest collection then extant of such works, making drawings from them himself, and throwing open his stores for others to study from, and then undertaking works on commission for which his pupils no less than himself were made available. As many as one hundred and thirty-seven painters and pictorial students passed through his school, established towards 1440, which became famous all over Italy. Mantegna was, as he deserved to be, Squarcione's favourite pupil. Squarcione adopted him as his son, and purposed making him the heir of his fortune. Andrea was only seventeen when he painted, in the church of S. Sofia in Padua, a Madonna picture of exceptional and recognized excellence. He was no doubt fully aware of having achieved no common feat, as he marked the work with his name and

the date, and the years of his age. This painting was destroyed in the 17th century.

As the youth progressed in his studies, he came under the influence of Jacopo Bellini, a painter considerably superior to Squarcione, father of the celebrated painters Giovanni and Gentile, and of a daughter Nicolosia; and in 1454 Jacopo gave Nicolosia to Andrea in marriage. This connexion of Andrea with the pictorial rival of Squarcione is generally assigned as the reason why the latter became alienated from the son of his adoption, and always afterwards hostile to him. Another suggestion, which rests, however, merely on its own internal probability, is that Squarcione had at the outset used his pupil Andrea as the unavowed executant of certain commissions, but that after a while Andrea began painting on his own account, thus injuring the professional interests of his chief. The remarkably definite and original style formed by Mantegna may be traced out as founded on the study of the antique in Squarcione's atelier, followed by a diligent application of principles of work exemplified by Paolo Uccello and Donatello, with the practical guidance and example of Jacopo Bellini in the sequel.

Among the other early works of Mantegna are the fresco of two saints over the entrance porch of the church of S. Antonio in Padua, 1452, and an altar-piece of St Luke and other saints for the church of S. Giustina, now in the Brera Gallery in Milan, 1453. It's probable, however, that before this time some of the pupils of Squarcione, including Mantegna, had already begun that series of frescoes in the chapel of S. Cristoforo, in the church of S. Agostino degli Eremitani, by which the great painter's reputation was fully confirmed, and which remain to this day conspicuous among his finest achievements.[1] The now censorious Squarcione found much to carp at in the earlier works of this series, illustrating the life of St James; he said the figures were like men of stone, and had better have been coloured stone-colour at once. Andrea, conscious as he was of his own great faculty and

mastery, seems nevertheless to have felt that there was something in his old preceptor's strictures; and the later subjects, from the legend of St Christopher, combine with his other excellences more of natural character and vivacity. Trained as he had been to the study of marbles and the severity of the antique, and openly avowing that he considered the antique superior to nature as being more eclectic in form, he now and always affected precision of outline, dignity of idea and of figure, and he thus tended towards rigidity, and to an austere wholeness rather than gracious sensitiveness of expression. His draperies are tight and closely folded, being studied (as it is said) from models draped in paper and woven fabrics gummed. Figures slim, muscular and bony, action impetuous but of arrested energy, tawny landscape, gritty with littering pebbles, mark the athletic hauteur of his style. He never changed, though he developed and perfected, the manner which he had adopted in Padua; his colouring, at first rather neutral and undecided, strengthened and matured. There is throughout his works more balancing of colour than fineness of tone. One of his great aims was optical illusion, carried out by a mastery of perspective which, though not always impeccably correct, nor absolutely superior in principle to the highest contemporary point of attainment, was worked out by himself with strenuous labour, and an effect of actuality astonishing in those times.

Successful and admired though he was in Padua, Mantegna left his native city at an early age, and never afterwards resettled there; the hostility of Squarcione has been assigned as the cause. The rest of his life was passed in Verona, Mantua and Rome—chiefly Mantua; Venice and Florence have also been named, but without confirmation.

It may have been in 1459 that he went to Verona; and he painted, though not on the spot, a grand altar-piece for the church of S. Zeno, a Madonna and angels, with four saints on each side. The Marquis Lodovico Gonzaga of Mantua had for some time been pressing Mantegna to enter his service; and the following year, 1460, was perhaps the one in which he actually

established himself at the Mantuan court, residing at first from time to time at Goito, but, from December 1466 onwards, with his family in Mantua itself. His engagement was for a salary of 75 lire (about £30) a month, a sum so large for that period as to mark conspicuously the high regard in which his art was held. He was in fact the first painter of any eminence ever domiciled in Mantua. He built a stately house in the city, and adorned it with a multitude of paintings. The house remains, but the pictures have perished. Some of his early Mantuan works are in that apartment of the Castello which is termed the Camera degli Sposi—full compositions in fresco, including various portraits of the Gonzaga family, and some figures of genii, &c. In 1488 he went to Rome at the request of Pope Innocent VIII., to paint the frescoes in the chapel of the Belvedere in the Vatican; the marquis of Mantua (Federigo) created him a cavaliere before his departure. This series of frescoes, including a noted "Baptism of Christ," was ruthlessly destroyed by Pius VI. in laying out the Museo Pio-Clementino. The pope treated Mantegna with less liberality than he had been used to at the Mantuan court; but on the whole their connexion, which ceased in 1490, was not unsatisfactory to either party. Mantegna then returned to Mantua, and went on with a series of works—the nine tempera-pictures, each of them 9 ft. square, of the "Triumph of Caesar"—which he had probably begun before his leaving for Rome, and which are now in Hampton Court. These superbly invented and designed compositions, gorgeous with all splendour of subject-matter and accessory, and with the classical learning and enthusiasm of one of the master-spirits of the age, have always been accounted of the first rank among Mantegna's works. They were sold in 1628 along with the bulk of the Mantuan art treasures, and were not, as is commonly said, plundered in the sack of Mantua in 1630. They are now greatly damaged by patchy repaintings. Another work of Mantegna's later years was the so-called "Madonna della Vittoria," now in the Louvre. It was painted in tempera about 1495, in commemoration of the battle of Fornovo, which Gianfrancesco Gonzaga found it convenient to represent to his lieges as an

Italian victory, though in fact it had been a French victory; the church which originally housed the picture was built from Mantegna's own design. The Madonna is here depicted with various saints, the archangel Michael and St Maurice holding her mantle, which is extended over the kneeling Gianfrancesco Gonzaga, amid a profusion of rich festooning and other accessory. Though not in all respects of his highest order of execution, this counts among the most obviously beautiful and attractive of Mantegna's works—from which the qualities of beauty and attraction are often excluded, in the stringent pursuit of those other excellences more germane to his severe genius, tense energy passing into haggard passion.

Vasari eulogizes Mantegna for his courteous, distinguished and praiseworthy deportment, although there are indications of his having been not a little litigious in disposition. With his fellow-pupils at Padua he had been affectionate; and for two of them, Dario da Trevigi and Marco Zoppo, he retained a steady friendship. That he had a high opinion of himself was natural, for no artist of his epoch could produce more manifest vouchers of marked and progressive attainment. He became very expensive in his habits, fell at times into difficulties, and had to urge his valid claims upon the marquis's attention. After his return to Mantua from Rome his prosperity was at its height, until the death of his wife. He then formed some other connexion, and became at an advanced age the father of a natural son, Giovanni Andrea; and at the last, although he continued launching out into various expenses and schemes, he had serious tribulations, such as the banishment from Mantua of his son Francesco, who had incurred the marquis's displeasure. Perhaps the aged master and connoisseur regarded as barely less trying the hard necessity of parting with a beloved antique bust of Faustina. Very soon after this transaction he died in Mantua, on the 13th of September 1506. In 1517 a handsome monument was set up to him by his sons in the church of S. Andrea, where he had painted the altar-piece of the mortuary chapel.

Mantegna was no less eminent as an engraver, though his history in that respect is somewhat obscure, partly because he never signed or dated any of his plates, unless in one single disputed instance, 1472. The account which has come down to us is that Mantegna began engraving in Rome, prompted by the engravings produced by Baccio Baldini of Florence after Sandro Botticelli; nor is there anything positive to invalidate this account, except the consideration that it would consign all the numerous and elaborate engravings made by Mantegna to the last sixteen or seventeen years of his life, which seems a scanty space for them, and besides the earlier engravings indicate an earlier period of his artistic style. It has been suggested that he began engraving while still in Padua, under the tuition of a distinguished goldsmith, Niccolò. He engraved about fifty plates, according to the usual reckoning; some thirty of them are mostly accounted indisputable—often large, full of figures, and highly studied. Some recent connoisseurs, however, ask us to restrict to seven the number of his genuine extant engravings—which appears unreasonable. Among the principal examples are “Roman Triumphs” (not the same compositions as the Hampton Court pictures), “A Bacchanal Festival,” “Hercules and Antaeus,” “Marine Gods,” “Judith with the Head of Holophernes,” the “Deposition from the Cross,” the “Entombment,” the “Resurrection,” the “Man of Sorrows,” the “Virgin in a Grotto.” Mantegna has sometimes been credited with the important invention of engraving with the burin on copper. This claim cannot be sustained on a comparison of dates, but at any rate he introduced the art into upper Italy. Several of his engravings are supposed to be executed on some metal less hard than copper. The technique of himself and his followers is characterized by the strongly marked forms of the design, and by the oblique formal hatchings of the shadows. The prints are frequently to be found in two states, or editions. In the first state the prints have been taken off with the roller, or even by

hand-pressing, and they are weak in tint; in the second state the printing press has been used, and the ink is stronger.

The influence of Mantegna on the style and tendency of his age was very marked, and extended not only to his own flourishing Mantuan school, but over Italian art generally. His vigorous perspectives and trenchant foreshortenings pioneered the way to other artists: in solid antique taste, and the power of reviving the aspect of a remote age with some approach to system and consistency, he distanced all contemporary competition. He did not, however, leave behind him many scholars of superior faculty. His two legitimate sons were painters of only ordinary ability. His favourite pupil was known as Carlo del Mantegna; Caroto of Verona was another pupil, Bonsignori an imitator. Giovanni Bellini, in his earlier works, obviously followed the lead of his brother-in-law Andrea.

The works painted by Mantegna, apart from his frescoes, are not numerous; some thirty-five to forty are regarded as fully authenticated. We may name, besides those already specified—in the Naples Museum, "St Euphemia," a fine early work; in Casa Melzi, Milan, the "Madonna and Child with Chanting Angels" (1461); in the Tribune of the Uffizi, Florence, three pictures remarkable for scrupulous finish; in the Berlin Museum, the "Dead Christ with two Angels"; in the Louvre, the two celebrated pictures of mythic allegory—"Parnassus" and "Minerva Triumphing over the Vices"; in the National Gallery, London, the "Agony in the Garden," the "Virgin and Child Enthroned, with the Baptist and the Magdalen," a late example; the monochrome of "Vestals," brought from Hamilton Palace; the "Triumph of Scipio" (or Phrygian Mother of the Gods received by the Roman Commonwealth), a tempera in chiaroscuro, painted only a few months before the master's death; in the Brera, Milan, the "Dead Christ, with the two Maries weeping," a remarkable *tour de force* in the way of foreshortening,

which, though it has a stunted appearance, is in correct technical perspective as seen from all points of view. With all its exceptional merit, this is an eminently ugly picture. It remained in Mantegna's studio unsold at his death, and was disposed of to liquidate debts.

Not to speak of earlier periods, a great deal has been written concerning Mantegna of late years. See the works by Maud Crutwell (1901), Paul Kristeller (1901), H. Thode (1897), Paul Yriarte (1901), Julia Cartwright, *Mantegna and Francia* (1881). (W. M. R.)

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1 His fellow-workers were Bono of Ferrara, Ansuino of Forlì, and Niccolò Pizzolo, to whom considerable sections of the fresco-paintings are to be assigned. The acts of St James and St Christopher are the leading subjects of the series. St James Exorcizing may have been commenced by Pizzolo, and completed by Mantegna. The Calling of St James to the Apostleship appears to be Mantegna's design, partially carried out by Pizzolo; the subjects of St James baptizing, his appearing before the judge, and going to execution, and most of the legend of St Christopher, are entirely by Mantegna.

MANTELL, GIDEON ALGERNON (1790-1852), English geologist and palaeontologist, was born in 1790 at Lewes, Sussex. Educated for the medical profession, he first practised in his native town, afterwards in 1835 in Brighton, and finally at Clapham, near London. He found time to prosecute researches on the palaeontology of the Secondary rocks, particularly in Sussex—a region which he made classical in the history of discovery. While he was still a country doctor at Lewes his eminence as a geological investigator was fully recognized on the publication of his work

on *The Fossils of the South Downs* (1822). His most remarkable discoveries were made in the Wealden formations. He demonstrated the fresh-water origin of the strata, and from them he brought to light and described the remarkable Dinosaurian reptiles known as *Iguanodon*, *Hylaeosaurus*, *Pelorosaurus* and *Regnosaurus*. For these researches he was awarded the Wollaston medal by the Geological Society and a Royal medal by the Royal Society. He was elected F.R.S. in 1825. Among his other contributions to the literature of palaeontology was his description of the Triassic reptile *Telerpelon elginense*. Towards the end of his life Dr Mantell retired to London, where he died on the 10th of November 1852. His eldest son, WALTER BALDOCK DURRANT MANTELL (1820-1895), settled in New Zealand, and there attained high public positions, eventually being secretary for Crown-lands. He obtained remains of the *Notornis*, a recently extinct bird, and also brought forward evidence to show that the moas were contemporaries of man.

In addition to the works above mentioned Dr Mantell was author of *Illustrations of the Geology of Sussex* (4to, 1827); *Geology of the South-east of England* (1833); *The Wonders of Geology*, 2 vols. (1838; ed. 7, 1857); *Geological Excursions round the Isle of Wight, and along the Adjacent Coast of Dorsetshire* (1847; ed. 3, 1854); *Petrifactions and their Teachings* (1851); *The Medals of Creation* (2 vols., 1854).

MANTES-SUR-SEINE, a town of northern France, capital of an arrondissement in the department of Seine-et-Oise on the left bank of the

Seine, 34 m. W.N.W. of Paris by rail. Pop. (1906), 8113. The chief building in Mantes is the celebrated church of Notre-Dame which dates in the main from the end of the 12th century. A previous edifice was burnt down by William the Conqueror together with the rest of the town, at the capture of which he lost his life in 1087; he is said to have bequeathed a large sum for the rebuilding of the church. The plan, which bears a marked resemblance to that of Notre-Dame at Paris, includes a nave, aisles and choir, but no transepts. Three portals open into the church on the west, the two northernmost, which date from the 12th century, being decorated with fine carving; that to the south is of the 14th century and still more ornate. A fine rose-window and an open gallery, above which rise the summits of the western towers, occupy the upper part of the façade. In the interior, chapels dating from the 13th and 14th centuries are of interest. The tower of St Maclou (14th century), relic of an old church and the hôtel de ville (15th to 17th centuries), are among the older buildings of the town, and there is a fountain of the Renaissance period. Modern bridges and a medieval bridge unite Mantes with the opposite bank of the Seine on which the town of Limay is built. The town has a sub-prefecture and a tribunal of first instance. Mantes was occupied by the English from 1346 to 1364, and from 1416 to 1449.

MANTEUFFEL, EDWIN, FREIHERR VON (1809-1885), Prussian general field marshal, son of the president of the superior court of Magdeburg, was born at Dresden on the 24th of February 1809. He was

brought up with his cousin, Otto von Manteuffel (1805-1882), the Prussian statesman, entered the guard cavalry at Berlin in 1827, and became an officer in 1828. After attending the War Academy for two years, and serving successively as aide-de-camp to General von Müffling and to Prince Albert of Prussia, he was promoted captain in 1843 and major in 1848, when he became aide-de-camp to Frederick William IV., whose confidence he had gained during the revolutionary movement in Berlin. Promoted lieutenant-colonel in 1852, and colonel to command the 5th Uhlans in 1853, he was sent on important diplomatic missions to Vienna and St Petersburg. In 1857 he became major-general and chief of the military cabinet. He gave hearty support to the prince regent's plans for the reorganization of the army. In 1861 he was violently attacked in a pamphlet by Karl Twesten (1820-1870), a Liberal leader, whom he wounded in a duel. He served as lieutenant-general (to which rank he was promoted on the coronation of William I., Oct. 18, 1861) in the Danish war of 1864, and at its conclusion was appointed civil and military governor of Schleswig. In the Austrian War of 1866 he first occupied Holstein and afterwards commanded a division under Vogel von Falkenstein in the Hanoverian campaign, and succeeded him, in July, in command of the Army of the Main (see SEVEN WEEKS' WAR). His successful operations ended with the occupation of Würzburg, and he received the order *pour le mérite*. He was, however, on account of his monarchist political views and almost bigoted Roman Catholicism, regarded by the parliament as a reactionary, and, unlike the other army commanders, he was not granted a money reward for his services. He then went on a diplomatic mission to St Petersburg, where he was *persona grata*, and succeeded in gaining Russia's assent to the new position in north Germany. On returning he was gazetted to the colonelcy of the 5th Dragoons. He was appointed to the command of the IX. (Schleswig-Holstein) army corps in 1866. But having formerly exercised both civil and military control in the Elbe duchies he was unwilling to be a purely military commander under one of his late civil subordinates, and retired from the army for a year. In 1868,

however, he returned to active service. In the Franco-German War of 1870-71 he commanded the I. corps under Steinmetz, distinguishing himself in the battle of Colombey-Neuilly, and in the repulse of Bazaine at Noisseville (see FRANCO-GERMAN WAR; and METZ). He succeeded Steinmetz in October in the command of the I. army, won the battle of Amiens against General Farre, and occupied Rouen, but was less fortunate against Faidherbe at Pont Noyelles and Bapaume. In January 1871 he commanded the newly formed Army of the South, which he led, in spite of hard frost, through the Côte d'Or and over the plateau of Langres, cut off Bourbaki's army of the east (80,000 men), and, after the action of Pontarlier, compelled it to cross the Swiss frontier, where it was disarmed. His immediate reward was the Grand Cross of the order of the Iron Cross, and at the conclusion of peace he received the Black Eagle. When the Southern Army was disbanded Manteuffel commanded first the II. army, and, from June 1871 until 1873, the army of occupation left in France, showing great tact in a difficult position. On leaving France at the close of the occupation, the emperor promoted Manteuffel to the rank of general field marshal and awarded him a large grant in money, and about the same time Alexander II. of Russia gave him the order of St Andrew. After this he was employed on several diplomatic missions, was for a time governor of Berlin, and in 1879, perhaps, as was commonly reported, because he was considered by Bismarck as a formidable rival, he was appointed governor-general of Alsace-Lorraine; and this office he exercised—more in the spirit, some said, of a Prussian than of a German official—until his death at Carlsbad, Bohemia, on the 17th of June 1885.

See lives by v. Collas (Berlin, 1874), and K. H. Keck (Bielefeld and Leipzig, 1890).

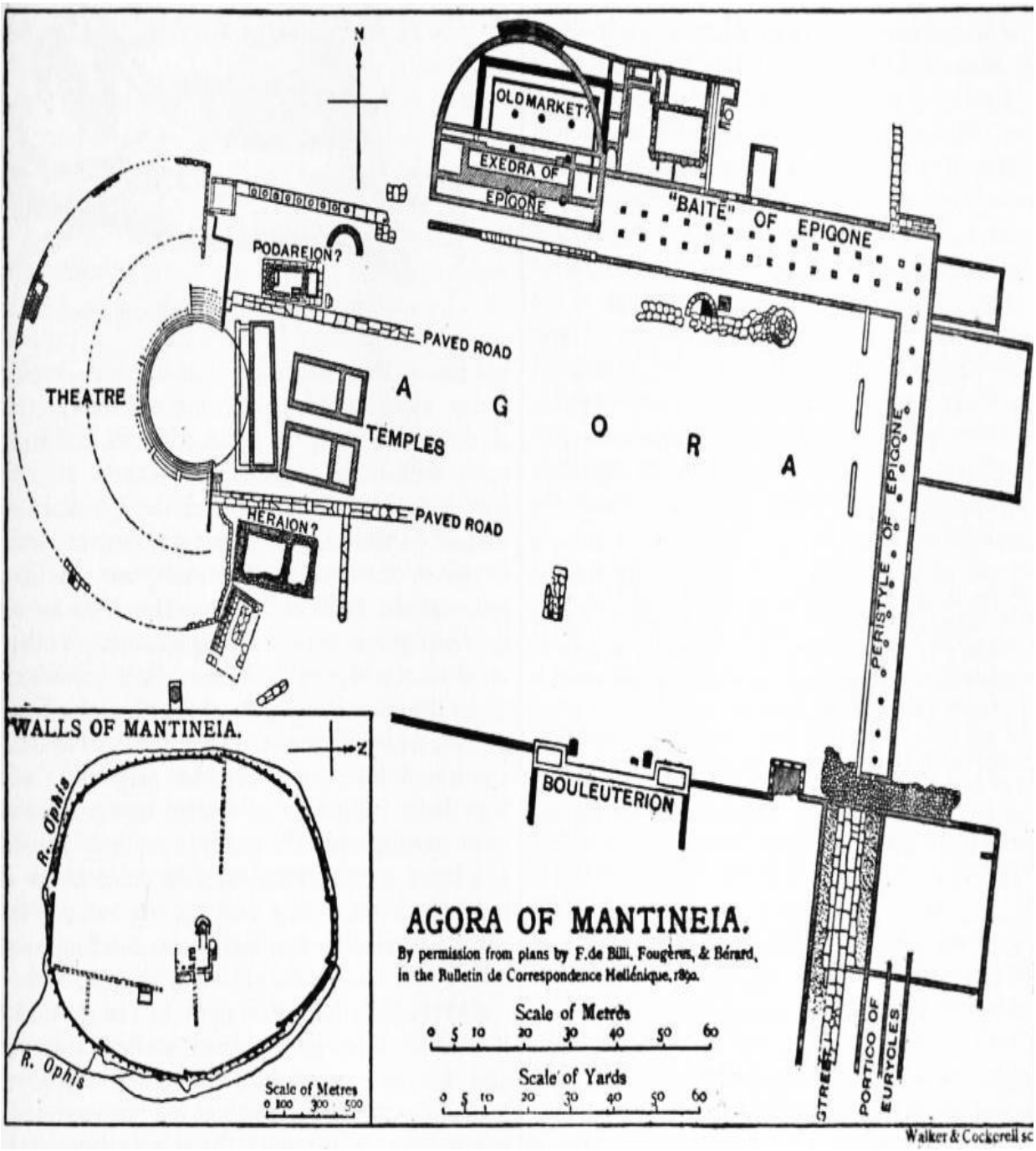
MANTINEIA, or MANTINEA, an ancient city of Arcadia, Greece, situated in the long narrow plain running north and south, which is now called after the chief town Tripolitsa. Tegea was in the same valley, about 10 m. S. of Mantineia, and the two cities continually disputed the supremacy of the district. In every great war we find them ranged on opposite sides, except when superior force constrained both. The worship and mysteries of Cora at Mantineia were famous. The valley in which the city lies has no opening to the coast, and the water finds its way, often only with much care and artificial aid, through underground passages (*katavothra*) to the sea. It is bounded on the west by Mount Maenalus, on the east by Mount Artemision.

Mantineia is mentioned in the Homeric catalogue of ships, but in early Greek times existed only as a cluster of villages inhabited by a purely agricultural community. In the 6th century it was still insignificant as compared with the neighbouring city of Tegea, and submitted more readily to Spartan overlordship. The political history of Mantineia begins soon after the Persian wars, when its five constituent villages, at the suggestion of Argos, were merged into one city, whose military strength forthwith secured it a leading position in the Peloponnesus. Its policy was henceforth guided by three main considerations. Its democratic constitution, which seems to have been entirely congenial to the population of small freeholders, and its ambition to gain control over the Alpheus watershed and both the Arcadian high roads to the isthmus, frequently estranged Mantineia from Sparta and threw it into the arms of Argos. But the chronic frontier disputes with Tegea,

which turned the two cities into bitter enemies, contributed most of all to determine their several policies. About 469 B.C. Mantineia alone of Arcadian townships refused to join the league of Tegea and Argos against Sparta. Though formally enrolled on the same side during the Peloponnesian War the two cities used the truce of 423 to wage a fierce but indecisive war with each other. In the time following the peace of Nicias the Mantineians, whose attempts at expansion beyond Mount Maenalus were being foiled by Sparta, formed a powerful alliance with Argos, Elis and Athens (420), which the Spartans, assisted by Tegea, broke up after a pitched battle in the city's territory (418). In the subsequent years Mantineia still found opportunity to give the Athenians covert help, and during the Corinthian War (394-387) scarcely disguised its sympathy with the anti-Spartan league. In 385 the Spartans seized a pretext to besiege and dismantle Mantineia and to scatter its inhabitants among four villages. The city was reconstituted after the battle of Leuctra and under its statesman Lycomedes played a prominent part in organizing the Arcadian League (370). But the long-standing jealousy against Tegea, and a recent one against the new foundation of Megalopolis, created dissensions which resulted in Mantineia passing over to the Spartan side. In the following campaign of 362 Mantineia, after narrowly escaping capture by the Theban general Epaminondas, became the scene of a decisive conflict in which the latter achieved a notable victory but lost his own life. After the withdrawal of the Thebans from Arcadia Mantineia failed to recover its pre-eminence from Megalopolis, with which city it had frequent disputes. In contrast with the Macedonian sympathies of Megalopolis Mantineia joined the leagues against Antipater (322) and Antigonus Gonatas (266). A change of constitution, imposed perhaps by the Macedonians, was nullified (about 250) by a revolution through which democracy was restored. About 235 B.C. Mantineia entered the Achaean League, from which it had obtained protection against Spartan encroachments, but soon passed in turn to the Aetolians and to Cleomenes III. of Sparta. A renewed defection, inspired apparently by aversion to the aristocratic government of the

Achaeans and jealousy of Megalopolis, was punished in 222 by a thorough devastation of the city, which was now reconstituted as a dependency of Argos and renamed Antigoneia in honour of the Achaeans' ally Antigonus Doson. Mantineia regained its autonomous position in the Achaean League in 192, and its original name during a visit of the emperor Hadrian in A.D. 133. Under the later Roman Empire the city dwindled into a mere village, which since the 6th century bore the Slavonic name of Goritza. It finally became a prey to the malaria which arose when the plain fell out of cultivation, and under Turkish rule disappeared altogether.

(M. O. B. C.)



The site was excavated by M. Fougères, of the French School at Athens, in 1888. The plan of the agora and adjacent buildings has been recovered, and the walls have been completely investigated. The town was situated in

an unusual position for a Greek city, on a flat marshy plain, and its walls form a regular ellipse about 2½ m. in circumference. When the town was first formed in 470 B.C. by the "synoecism" of the neighbouring villages, the river Ophis flowed through the midst of it, and the Spartan king Agesipolis dammed it up below the town and so flooded out the Mantineians and sapped their walls, which were of unbaked brick. Accordingly, when the city was rebuilt in 370 B.C., the river Ophis was divided into two branches, which between them encircled the walls; and the walls themselves were constructed to a height of about 3 to 6 feet of stone, the rest being of unbaked brick. These are the walls of which the remains are still extant. There are towers about every 80 ft.; and the gates are so arranged that the passage inwards usually runs from right to left, and so an attacking force would have to expose its right or shieldless side. Within the walls the most conspicuous landmark is the theatre, which, unlike the majority of Greek theatres, consists entirely of an artificial mound standing up from the level plain. Only about a quarter of its original height remains. Its *scena* is of rather irregular shape, and borders one of the narrow ends of the agora. Close to it are the foundations of several temples, one of them sacred to the hero Podaros. The agora is of unsymmetrical form; its sides are bordered by porticoes, interrupted by streets, like the primitive agora of Elis as described by Pausanias, and unlike the regular agoras of Ionic type. Most of these porticoes were of Roman period—the finest of them were erected, as we learn from inscriptions, by a lady named Epigone: one, which faced south, had a double colonnade, and was called the Βαίτη: close to it was a large exedra. The foundations of a square market-hall of earlier date were found beneath this. On the opposite side of the agora was an extensive Bouleuterion or senate-house. Traces remain of paved roads both within the agora and leading out of it; but the whole site is now a deserted and feverish swamp. The site is interesting for comparison with Megalopolis; the nature of its plan seems to imply that its main features must survive from the earlier "synoecism" a century before the time of Epaminondas.

See Strabo viii. 337; Pausanias viii. 8; Thucyd. iv. 134, v.; Xenophon, *Hellenica*, iv.-vii.; Diodorus xv. 85-87; Polybius ii. 57 sqq., vi. 43; D. Worenka, *Mantineia* (1905); B. V. Head, *Historia numorum* (Oxford, 1887), pp. 376-377; G. Fougères in *Bulletin de correspondance hellénique* (1890), id. *Mantinée et l'Arcadie orientale* (Paris, 1898). Consult also TEGEA; ARCADIA.

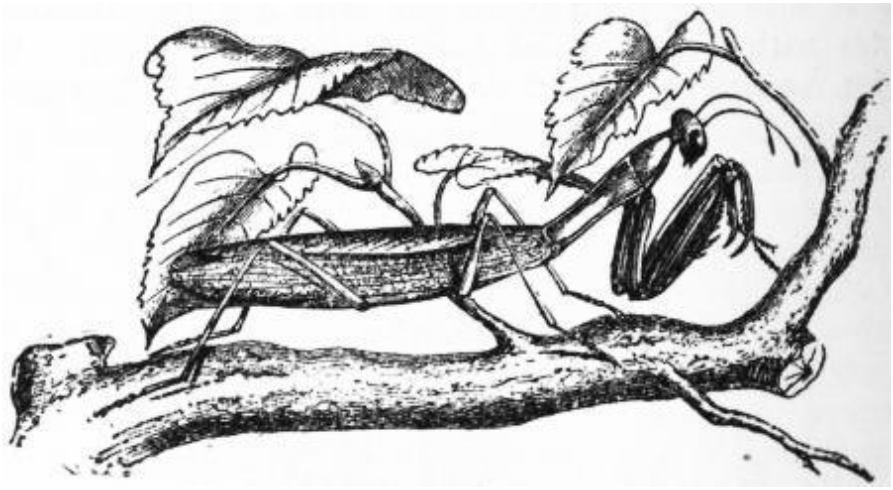
Five battles are recorded to have been fought near Mantineia; 418, 362 (see above), 295 (Demetrius Poliorcetes defeats Archidamus of Sparta), 242 (Aratus beats Agis of Sparta), 207 (Philopoemen beats Machanidas of Sparta). The battles of 362 and 207 are discussed at length by J. Kromayer, *Antike Schtachtfelder in Griechenland* (Berlin, 1903), 27-123, 281-314; *Wiener Studien* (1905), pp. 1-16.

(E. GR.)

MANTIS, an insect belonging to the order *Orthoptera*. Probably no other insect has been the subject of so many and widespread legends and superstitions as the common "praying mantis," *Mantis religiosa*, L. The ancient Greeks endowed it with supernatural powers (μάντις, a diviner); the Turks and Arabs hold that it prays constantly with its face turned towards Mecca; the Provençals call it *Prega-Diou* (*Prie-Dieu*); and numerous more or less similar names—preacher, saint, nun, mendicant, soothsayer, &c.—are widely diffused throughout southern Europe. In Nubia it is held in great esteem, and the Hottentots, if not indeed worshipping the local species (*M. fausta*), as one traveller has alleged, at least appear to regard its alighting upon any person both as a token of saintliness and an omen of good fortune.

Yet these are “not the saints but the tigers of the insect world.” The front pair of limbs are very peculiarly modified—the coxa being greatly elongated, while the strong third joint or femur bears on its curved underside a channel armed on each edge by strong movable spines. Into this groove the stout tibia is capable of closing like the blade of a pen-knife, its sharp, serrated edge being adapted to cut and hold. Thus armed, with head raised upon the much-elongated and semi-erect prothorax, and with the half-opened fore-limbs held outwards in the characteristic devotional attitude, it rests motionless upon the four posterior limbs waiting for prey, or occasionally stalks it with slow and silent movements, finally seizing it with its knife-blades and devouring it. Although apparently not daring to attack ants, these insects destroy great numbers of flies, grasshoppers and caterpillars, and the larger South-American species even attack small frogs, lizards and birds. They are very pugnacious, fencing with their sword-like limbs “like hussars with sabres,” the larger frequently devouring the smaller, and the females the males. The Chinese keep them in bamboo cages, and match them like fighting-cocks.

The common species fixes its somewhat nut-like egg capsules on the stems of plants in September. The young are hatched in early summer, and resemble the adults, but are without wings.



Praying Mantis (*Mantis religiosa*).

The green coloration and shape of the typical mantis are procryptic, serving to conceal the insect alike from its enemies and prey. The passage from leaf to flower simulation is but a step which, without interfering with the protective value of the coloration so far as insectivorous foes are concerned, carries with it the additional advantage of attracting flower-feeding insects within reach of the raptorial limbs. This method of allurement has been perfected in certain tropical species of *Mantidae* by the development on the prothorax and raptorial limbs of laminate expansions so coloured on the under side as to resemble papilionaceous or other blossoms, to which the likeness is enhanced by a gentle swaying kept up by the insect in imitation of the effect of a lightly blowing breeze. As instances of this may be cited *Idalum diabolicum*, an African insect, and *Gongylus gongyloides*, which comes from India. Examples of another species (*Empusa eugena*) when standing upon the ground deceptively imitate in shape and hue a greenish white anemone tinted at the edges with rose; and Bates records what appears to be a true case of aggressive mimicry practised by a Brazilian species which exactly resembles the white ants it preys upon.

MANTIS-FLY, the name given to neuropterous insects of the family *Mantispidae*, related to the ant-lions, lace-wing flies, &c., and named from their superficial resemblance to a *Mantis* owing to the length of the prothorax and the shape and prehensorial nature of the anterior legs. The

larva, at first campodeiform, makes its way into the egg-case of a spider or the nest of a wasp to feed upon the eggs or young. Subsequently it changes into a fat grub with short legs. When full grown it spins a silken cocoon in which the transformation into the pupa is effected. The latter escapes from its double case before moulting into the mature insect.

MANTLE, a long flowing cloak without sleeves, worn by either sex. Particularly applied to the long robe worn over the armour by the men-at-arms of the middle ages, the name is still given to the robes of state of kings, peers, and the members of an order of knights. Thus the "electoral mantle" was a robe of office worn by the imperial electors, and the Teutonic knights were known as the *orde alborum mantellorum* from their white mantles. As an article of women's dress a mantle now means a loose cloak or cape, of any length, and made of silk, velvet, or other rich material. The word is derived from the Latin *mantellum* or *mantelum*, a cloak, and is probably the same as, or another form of, *mantelium* or *mantele*, a table-napkin or table-cloth, from *manus*, hand, and *tela*, a cloth. A late Latin *mantum*, from which several Romance languages have taken words (cf. Ital. *manto*, and Fr. *mante*), must, as the *New English Dictionary* points out, be a "back-formation," and this will explain the diminutive form of the Spanish *mantilla*. From the old French *mantel* came the English compounds "mantel-piece," "mantel-shelf," for the stone or wood beam which serves as a support for the structure above a fire-place, together with the whole framework, whether of wood, stone, &c., that acts as an ornament of the same (see CHIMNEYPIECE). The modern French form *manteau* is used in English chiefly as a dressmaker's term for a woman's mantle. "Mantua," much used in the 18th century for a similar garment, is probably a corruption of *manteau*, due to silk or other materials coming from the Italian town of that name, and known by the trade name of "mantuas." The Spanish *mantilla* is a covering for the head and shoulders of white or black lace or other material, the characteristic head-dress of women in southern and central Spain. It is occasionally seen in the other parts of Spain and Spanish countries, and also in Portugal.

"Mantle" is used in many transferred senses, all with the meaning of "covering," as in zoology, for an enclosing sac or integument; thus it is applied to the "tunic" or layer of connective-tissue forming the body-wall of ascidians enclosing muscle-fibres, blood-sinuses and nerves (see TUNICATA). The term is also used for a meshed cap of refractory oxides employed in systems of incandescent lighting (see LIGHTING). The verb is used for the creaming or frothing of liquids and of the suffusing of the skin with blood. In heraldry "mantling," also known as "panache," "lambrequin" or "contoise," is an ornamental appendage to an escutcheon, of flowing drapery, forming a background (see HERALDRY).

MANTON, THOMAS (1620-1677), English Nonconformist divine, was born at Laurence Lydiard, Somerset, in 1620, and was educated at Hart Hall, Oxford. Joseph Hall, bishop of Norwich,

ordained him deacon: he never took priest's orders, holding that "he was properly ordained to the ministerial office." He was one of the clerks at the Westminster Assembly, one of Cromwell's chaplains and a "trier," and held livings at Stoke Newington (1645) and St Paul's, Covent Garden (1656). He disapproved of the execution of Charles I. In 1658 he assisted Baxter to draw up the "Fundamentals of Religion." He helped to restore Charles II. and became one of his chaplains, refusing the deanery of Rochester. In 1662 he lost his living under the Act of Uniformity and preached in his own rooms and in other parts of London. For this he was arrested in 1670.

His works are best known in the collected edition by J. C. Ryle (22 vols. 1870-1875).

MAN-TRAPS, mechanical devices for catching poachers and trespassers. They have taken many forms, the most usual being like a large rat-trap, the steel springs being armed with teeth which met in the victim's leg. Since 1827 they have been illegal in England, except in houses between sunset and sunrise as a defence against burglars.

MANTUA (Ital. *Mantova*), a fortified city of Lombardy, Italy, the capital of the province of Mantua, the see of a bishop, and the centre of a military district, 25 m. S.S.W. of Verona and 100 m. E.S.E. of Milan by rail. Pop. (1906), 31,783. It is situated 88 ft. above the level of the Adriatic on an almost insular site in the midst of the swampy lagoons of the Mincio. As the belt of marshy ground along the south side can be laid under water at pleasure, the site of the city proper, exclusive of the considerable suburbs of Borgo di Fortezza to the north and Borgo di San Giorgio to the east, may still be said to consist, as it formerly did more distinctly, of two islands separated by a narrow channel and united by a number of bridges. On the west side lies Lago Superiore, on the east side Lago Inferiore—the boundary between the two being marked by the *Argine del Mulino*, a long mole stretching northward from the north-west angle of the city to the citadel.

On the highest ground in the city rises the cathedral, the interior of which was built after his death according to the plans of Giulio Romano; it has double aisles, a fine fretted ceiling, a dome-covered transept, a bad baroque façade, and a large unfinished Romanesque tower. Much more important architecturally is the church of St Andrea, built towards the close of the 15th century, after plans by Leon

Battista Alberti, and consisting of a single, barrel-vaulted nave 350 ft. long by 62 ft. wide. It has a noble façade with a deeply recessed portico, and a brick campanile of 1414. The interior is decorated with 18th-century frescoes, to which period the dome also belongs. Mantegna is buried in one of the side chapels. S. Sebastiano is another work of Alberti's. The old ducal palace—one of the largest buildings of its kind in Europe—was begun in 1302 for Guido Bonaccolsi, and probably completed in 1328 for Ludovico Gonzaga; but many of the accessory apartments are of much later date, and the internal decorations are for the most part the work of Giulio Romano and his pupils. There are also some fine rooms of the early 19th century. Close by are the Piazza dell' Erbe and the Piazza Sordello, with Gothic palaces. The Castello di Corte here, the old castle of the Gonzagas (1395-1406), erected by Bartolino da Novara, the architect of the castle of Ferrara, now contains the archives, and has some fine frescoes by Mantegna with scenes from the life of Ludovico Gonzaga. Outside of the city, to the south of Porta Pusterla, stands the Palazzo del Te, Giulio's architectural masterpiece, erected for Frederick Gonzaga in 1523-1535; of the numerous fresco-covered chambers which it contains, perhaps the most celebrated is the Sala dei Giganti, where, by a combination of mechanical with artistic devices, the rout of the Titans still contending with artillery of uptorn rocks against the pursuit and thunderbolts of Jove appears to rush downwards on the spectator. The architecture of Giulio's own house in the town is also good.

Mantua has an academy of arts and sciences (*Accademia Vergiliana*), occupying a fine building erected by Piermarini, a public library founded in 1780 by Maria Theresa, a museum of antiquities dating from 1779, many of which have been brought from Sabbioneta, a small residence town of the Gonzagas in the late 16th century, a mineralogical museum, a good botanical garden, and an observatory. There are ironworks, tanneries, breweries, oil-mills and flour-mills in the town, which also has printing, furriery, doll-making and playing-card industries. As a fortress Mantua was long one of the most formidable in Europe, a force of thirty to forty thousand men finding accommodation within its walls; but it had two serious defects—the marshy climate told heavily on the health of the garrison, and effective sorties were almost impossible. It lies on the main line of railway between Verona and Modena; and is also connected by rail with Cremona and with Monselice, on the line from Padua to Bologna, and by steam tramway with Brescia and other places.

S. Maria delle Grazie, standing some 5 m. outside the town, was consecrated in 1399 as an act of thanksgiving for the cessation of the plague, and has a curious collection of *ex voto* pictures (wax figures), and also the tombs of the Gonzaga family.

Mantua had still a strong Etruscan element in its population during the Roman period. It became a Roman municipium, with the rest of Gallia Transpadana; but Martial calls it little Mantua, and had it not been for Virgil's interest in his native place, and in the expulsion of a number of the Mantuans (and among them the poet himself) from their lands in favour of Octavian's soldiers, we should probably have heard almost nothing of its existence. In 568 the Lombards found Mantua a walled town of some strength; recovered from their grasp in 590 by the exarch of Ravenna, it was again captured by Agilulf in 601. The 9th century was the period of episcopal supremacy, and in the 11th the city formed part of the vast possessions of Bonifacio, marquis of Canossa. From him it passed to Geoffrey, duke of Lorraine, and afterwards to the countess Matilda, whose support of the pope led to the conquest of Mantua by the emperor Henry IV. in 1090. Reduced to obedience by Matilda in 1113, the city obtained its liberty on her death, and instituted a communal government of its own, *salva imperiali justitia*. It afterwards joined the

Lombard League; and the unsuccessful attack made by Frederick II. in 1236 brought it a confirmation of its privileges. But after a period of internal discord Ludovico Gonzaga attained to power (1328), and was recognized as imperial vicar (1329); and from that time till the death of Ferdinando Carbo in 1708 the Gonzagas were masters of Mantua (see GONZAGA). Under Gian Francesco II., the first marquis, Ludovico III., Gian Francesco III. (whose wife was Isabella d'Este), and Federico II., the first duke of Mantua, the city rose rapidly into importance as a seat of industry and culture. It was stormed and sacked by the Austrians in 1630, and never quite recovered. Claimed in 1708 as a fief of the empire by Joseph I., it was governed for the greater part of the century by the Austrians. In June 1796 it was besieged by Napoleon; but in spite of terrific bombardments it held out till February 1797. A three days' bombardment in 1799 again placed Mantua in the hands of the Austrians; and, though restored to the French by the peace of Lunéville (1801), it became Austrian once more from 1814 till 1866. Between 1849 and 1859, when the whole of Lombardy except Mantua was, by the peace of Villafranca, ceded to Italy, the city was the scene of violent political persecution.

See Gaet. Susani, *Nuovo prospetto delle pitture, &c., di Mantova* (Mantua, 1830); Carlo d'Arco, *Delle arti e degli artefici di Mantova* (Mantua, 1857); and *Storia di Mantova* (Mantua, 1874).

MANU (Sanskrit, "man"), in Hindu mythology, the first man, ancestor of the world. In the Satapatha-Brahmana he is represented as a holy man, the chief figure in a flood-myth. Warned by a fish of the impending disaster he built a ship, and when the waters rose was dragged by the fish, which he harnessed to his craft, beyond the northern mountains. When the deluge ceased, a daughter was miraculously born to him and this pair became the ancestors of the human race. In the later scriptures the fish is declared an incarnation of Brahma. See SANSKRIT LITERATURE; INDIAN LAW (*Hindu*).

MANUAL, *i.e.* belonging to the hand (Lat. *manus*), a word chiefly used to describe an occupation which employs the hands, as opposed to that which chiefly or entirely employs the mind. Particular uses of the word are: "sign-manual," a signature or autograph, especially one affixed to a state document; "manual-exercise," in military usage, drill in the handling of the rifle; "manual alphabet," the formation of the letters of the alphabet by the fingers of one or both hands for communication with the deaf and dumb; and "manual acts," the breaking of the bread, and the taking of the cup in the hands by the officiating priest

in consecrating the elements during the celebration of the Eucharist. The use of the word for tools and implements to be used by the hand, as distinct from machinery, only survives in the "manual fire-engine." From the late Latin use of *manuale* as a substantive, meaning "handbook," comes the use of the word for a book treating a subject in a concise way, but more particularly of a book of offices, containing the forms to be used in the administration of the sacraments other than the Mass, but including communion out of the Mass, also the forms for churching, burials, &c. In the Roman Church such a book is usually called a *rituale*, "manual" being the name given to it in the English Church before the Reformation. The keyboard of an organ, as played by the hands, is called the "manual," in distinction from the "pedal" keys played by the feet.

MANUCODE, from the French, an abbreviation of *Manucodiata*, and the Latinized form of the Malay *Manukdewata*, meaning, says Crawfurd (*Malay and Engl. Dictionary*, p. 97), the "bird of the gods," and a name applied for more than two hundred years apparently to birds-of-paradise in general. In the original sense of its inventor, Montbeillard (*Hist. nat. oiseaux*, iii. 163), *Manucode* was restricted to the king bird-of-paradise and three allied species; but in English it has curiously been transferred[1] to a small group of species whose relationship to the *Paradiseidae* has been frequently doubted, and must be considered uncertain. These manucodes have a glossy steel-blue plumage of much beauty, but are distinguished from other birds of similar coloration by the outer and middle toes being united for some distance, and by the extraordinary convolution of the trachea, in the males at least, with which is correlated the loud and clear voice of the birds. The convoluted portion of the trachea lies on the breast, between the skin and the muscles, much as is found in the females of the painted snipes (*Rostratula*), in the males of the curassows (*Cracidae*), and in a few other birds, but wholly unknown elsewhere among the *Passeres*. The manucodes are peculiar to the Papuan sub-region (including therein the peninsula of Cape York), and comprehend, according to R. B. Sharpe (*Cat. B. Brit. Museum*, iii. 164), two genera, for the first of which, distinguished by the elongated tufts on the head, he adopts R. P. Lesson's name *Phonygama*, and for the second, having no tufts, but the feathers of the head crisped, that of *Manucodia*; and W. A. Forbes (*Proc. Zool. Soc.* 1882, p. 349) observed that the validity of the separation was confirmed by their tracheal formation. Of *Phonygama* Sharpe recognizes three species, *P. keraudreni* (the type) and *P. jamesi*, both from New Guinea, and *P. gouldi*, the Australian representative species; but the first two are considered by D. G. Elliot (*Ibis.* 1878, p. 56) and Count Salvadori (*Ornitol. della Papuasia*, ii. 510) to be inseparable. There is a greater unanimity in regard to the species of the so-called genus *Manucodia* proper, of which four are admitted—*M. chalybeata* or *chalybea* from north-western New Guinea, *M. comriei* from the south-eastern part of the same country, *M. atra* of wide distribution within the Papuan area, and *M. jobiensis* peculiar to the island which gives it a name. Little is known of the habits of these birds, except that they are, as already mentioned, remarkable for their vocal powers, which, in *P. keraudreni*, Lesson

describes (*Voy. de la Coquille*, “Zoologie,” i. 638) as enabling them to pass through every note of the gamut.

(A. N.)

1 *Manucodiata* was used by M. J. Brisson (*Ornithologie*, ii. 130) as a generic term equivalent to the Linnaean *Paradisea*. In 1783 Boddaert, when assigning scientific names to the birds figured by Daubenton, called the subject of one of them (*Pl. enlum.* 634) *Manucodia chalybea*, the first word being apparently an accidental curtailment of the name of Brisson’s genus to which he referred it. Nevertheless some writers have taken it as evidence of an intention to found a new genus by that name, and hence the importation of *Manucodia* into scientific nomenclature, and the English form to correspond.

MANUEL I., COMNENUS (*c.* 1120-1180), Byzantine emperor (1143-1180), the fourth son of John II., was born about 1120. Having distinguished himself in his father’s Turkish war, he was nominated emperor in preference to his elder surviving brother. Endowed with a fine physique and great personal courage, he devoted himself whole-heartedly to a military career. He endeavoured to restore by force of arms the predominance of the Byzantine empire in the Mediterranean countries, and so was involved in conflict with his neighbours on all sides. In 1144 he brought back Raymond of Antioch to his allegiance, and in the following year drove the Turks out of Isauria. In 1147 he granted a passage through his dominions to two armies of crusaders under Conrad III. of Germany and Louis VII. of France; but the numerous outbreaks of overt or secret hostility between the Franks and the Greeks on their line of march, for which both sides were to blame, nearly precipitated a conflict between Manuel and his guests. In the same year the emperor made war upon Roger of Sicily, whose fleet captured Corfu and plundered the Greek towns, but in 1148 was defeated with the help of the Venetians. In 1149 Manuel recovered Corfu and prepared to take the offensive against the Normans. With an army mainly composed of mercenary Italians he invaded Sicily and Apulia, and although the progress of both these expeditions was arrested by defeats on land and sea, Manuel maintained a foothold in southern Italy, which was secured to him by a peace in 1155, and continued to interfere in Italian politics. In his endeavour to weaken the control of Venice over the trade of his empire he made treaties with Pisa and Genoa; to check the aspirations of Frederic I. of Germany he supported the free Italian cities with his gold and negotiated with pope Alexander III. In spite of his friendliness towards the Roman church Manuel was refused the title of “Augustus” by Alexander, and he nowhere succeeded in attaching the Italians permanently to his interests. None the less in a war with the Venetians (1172-74), he not only held his ground in Italy but drove his enemies out of the Aegean Sea. On his northern frontier Manuel reduced the rebellious Serbs to vassalage (1150-52) and made repeated attacks upon the Hungarians with a view to annexing their territory along the Save. In the wars of 1151-53 and 1163-68 he led his troops into Hungary but failed to maintain himself there; in 1168, however, a decisive victory near Semlin enabled him to conclude a peace by which Dalmatia and other frontier strips were ceded to him. In 1169 he sent a joint expedition with King Amalric of Jerusalem to Egypt, which retired after an ineffectual attempt to capture Damietta. In 1158-59 he fought with success against Raymond of Antioch and the Turks of Iconium, but in later wars against the latter he

made no headway. In 1176 he was decisively beaten by them in the pass of Myriokephalon, where he allowed himself to be surprised in line of march. This disaster, though partly retrieved in the campaign of the following year, had a serious effect upon his vitality; henceforth he declined in health and in 1180 succumbed to a slow fever.

In spite of his military prowess Manuel achieved but in a slight degree his object of restoring the East Roman empire. His victories were counterbalanced by numerous defeats, sustained by his subordinates, and his lack of statesmanlike talent prevented his securing the loyalty of his subjects. The expense of keeping up his mercenary establishment and the sumptuous magnificence of his court put a severe strain upon the financial resources of the state. The subsequent rapid collapse of the Byzantine empire was largely due to his brilliant but unproductive reign. Manuel married, firstly, a sister-in-law of Conrad III. of Germany; and secondly, a daughter of Raymond of Antioch. His successor, Alexis II., was a son of the latter.

See John Cinnamus, *History of John and Manuel* (ed. 1836, Bonn); E. Gibbon, *The Decline and Fall of the Roman Empire* (ed. Bury, London, 1896), v. 229 sqq., vi. 214 sqq.; G. Finlay, *History of Greece* (ed. 1877, Oxford), iii. 143-197; H. v. Kap-Herr, *Die abendländische Politik Kaiser Manuels* (Strassburg, 1881).

(M. O. B. C.)

MANUEL II. PALAEOLOGUS

(1350-1425), Byzantine emperor from 1391 to 1425, was born in 1350. At the time of his father's death he was a hostage at the court of Bayezid at Brusa, but succeeded in making his escape; he was forthwith besieged in Constantinople by the sultan, whose victory over the Christians at Nicopolis, however (Sept. 28, 1396), did not secure for him the capital. Manuel subsequently set out in person to seek help from the West, and for this purpose visited Italy, France, Germany and England, but without material success; the victory of Timur in 1402, and the death of Bayezid in the following year were the first events to give him a genuine respite from Ottoman oppression. He stood on friendly terms with Mahommed I., but was again besieged in his capital by Murad II. in 1422. Shortly before his death he was forced to sign an agreement whereby the Byzantine empire undertook to pay tribute to the sultan.

Manuel was the author of numerous works of varied character—theological, rhetorical, poetical and letters. Most of these are printed in Migne, *Patrologia graeca*, clvi.; the letters have been edited by E. Legrand (1893). There is a special monograph, by B. de Xivrey (in *Mémoires de l'Institut de France*, xix. (1853), highly commended by C. Krumbacher, whose *Geschichte der byzantinischen Litteratur* (1897) should also be consulted.

MANUEL I. (d. 1263), emperor of Trebizond, surnamed the Great Captain (ὁ στρατηγικώτατος), was the second son of Alexius I., first emperor of Trebizond, and ruled from 1228 to 1263. He was unable to deliver his empire from vassalage, first to the Seljuks and afterwards to the Mongols. He vainly negotiated for a dynastic alliance with the Franks, by which he hoped to secure the help of Crusaders.

MANUEL II., the descendant of Manuel I., reigned only a few months in 1332-1333. Manuel III. reigned from 1390 to 1417, but the only interest attaching to his name arises from his connexion with Timur, whose vassal he became without resistance.

See G. Finlay, *History of Greece* (ed. 1877, Oxford), iv. 338-340, 340-341, 386; Ph. Fallmerayer, *Geschichte des Kaisertums Trapezunt* (Munich, 1827), i. chs. 8, 14, ii. chs. 4, 5; T. E. Evangelides, Ἱστορία τῆς Τραπεζοῦντος (Odessa, 1898), 71-73, 87-88, 126-132.

MANUEL, EUGENE (1823-1901), French poet and man of letters, was born in Paris, the son of a Jewish doctor, on the 13th of July 1823. He was educated at the École Normale, and taught rhetoric for some years in provincial schools and then in Paris. In 1870 he entered the department of public instruction, and in 1878 became inspector-general. His works include: *Pages intimes* (1866), which received a prize from the Academy; *Poèmes populaires* (1874); *Pendant la guerre* (1871), patriotic poems, which were forbidden in Alsace-Lorraine by the German authorities; *En voyage* (1881), poems; *La France* (4 vols., 1854-1858); a school-book written in collaboration with his brother-in-law, Lévi Alavarès; *Les Ouvriers* (1870), a drama dealing with social questions, which was crowned by the Academy; *L'Absent* (1873), a comedy; *Poésies du foyer et de l'école* (1889), and editions of the works of J. B. Rousseau (1852) and André Chénier (1884). He died in Paris in 1901.

His *Poésies complètes* (2 vols., 1899) contained some fresh poems; to his *Mélanges en prose* (Paris, 1905) is prefixed an introductory note by A. Cahen.

MANUEL, JACQUES ANTOINE (1775-1827), French politician and orator, was born on the 10th of December 1775. When seventeen years old he entered the army, which he left in 1797 to become a lawyer. In 1814 he was chosen a member of the chamber of representatives, and in 1815 he urged the claim of Napoleon's son to the French throne and protested against the restoration of the Bourbons. After this event be actively opposed the government, his eloquence making him the foremost orator among the members of the Left. In February 1823 his opposition to the proposed expedition into Spain to help Ferdinand VII. against his rebellious subjects produced a tumult in the Assembly. Manuel was expelled, but he refused to accept this sentence, and force was employed to remove him. He died on the 20th of August 1827.

MANUEL, LOUIS PIERRE (1751-1793), French writer and Revolutionist, was born at Montargis (Loiret). He entered the Congregation of the Christian Doctrine, and became tutor to the son of a Paris banker. In 1783 he published a pamphlet, called *Essais historiques, critiques, littéraires, et philosophiques*, for which he was imprisoned in the Bastille. He embraced the revolutionary ideas, and after the taking of the Bastille became a member of the provisional municipality of Paris. He was one of the leaders of the *émeutes* of the 20th of June and the 10th of August 1792, played an important part in the formation of the revolutionary commune which assured the success of the latter *coup*, and was made *procureur* of the commune. He was present at the September massacres and saved several prisoners, and on the 7th of September 1792 was elected one of the deputies from Paris to the convention, where he was one of the promoters of the proclamation of the republic. He suppressed the decoration of the Cross of St Louis, which he called a stain on a man's coat, and demanded the sale of the palace of Versailles. His missions to the king, however, changed his sentiments; he became reconciled to Louis, courageously refused to vote for the death of the sovereign, and had to tender his resignation as deputy. He retired to Montargis, where he was arrested, and was guillotined in Paris on the 17th of November 1793. Besides the work cited above and his political pamphlets, he was the author of *Coup d'œil philosophique sur le règne de St Louis* (1786); *L'Année française* (1788); *La Bastille dévoilée* (1789); *La Police de Paris dévoilée* (1791); and *Lettres sur la Révolution* (1792). In 1792 he was prosecuted for publishing an edition of the *Lettres de Mirabeau à Sophie*, but was acquitted.

MANUEL DE MELLO, DOM FRANCISCO (? 1611-1666), Portuguese writer, a connexion on his father's side of the royal house of Braganza, was a native of Lisbon. He studied the Humanities at the Jesuit College of S. Antão, where he showed a precocious talent, and tradition says that at the age of fourteen he composed a poem in *ottava rima* to celebrate the recovery of Bahia from the Dutch, while at seventeen he wrote a scientific work, *Concordancias mathematicas*. The death of his father, Dom Luiz de Mello, drove him early to soldiering, and having joined a contingent for the Flanders war, he found himself in the historic storm of January 1627, when the pick of the Portuguese fleet suffered shipwreck in the Bay of Biscay. He spent much of the next ten years of his life in military routine work in the Peninsula, varied by visits to the court of Madrid, where he contracted a friendship with the Spanish poet Quevedo and earned the favour of the powerful minister Olivares. In 1637 the latter despatched him in company with the conde de Linhares on a mission to pacify the revolted city of Evora, and on the same occasion the duke of Braganza, afterwards King John IV. (for whom he acted as confidential agent at Madrid), employed him to satisfy King Philip of his loyalty to the Spanish crown. In the following year he suffered a short imprisonment in Lisbon. In 1639 he was appointed colonel of one of the regiments raised for service in Flanders, and in June that year he took a leading part in defending Corunna against a French fleet commanded by the archbishop of Bordeaux, while in the following August he directed the embarcation of an expeditionary force of 10,000 men when Admiral Oquendo sailed with seventy ships to meet the French and Dutch. He came safely through the naval defeat in the channel suffered by the Spaniards at the hands of Van Tromp, and on the outbreak of the Catalonian rebellion became chief of the staff to the commander-in-chief of the royal forces, and was selected to write an account of the campaign, the *Historia de la guerra de Cataluña,* which became a Spanish classic. On the proclamation of Portuguese independence in 1640 he was imprisoned by order of Olivares, and when released hastened to offer his sword to John IV. He travelled to England, where he spent some time at the court of Charles I., and thence passing over to Holland assisted the Portuguese ambassador to equip a fleet in aid of Portugal, and himself brought it safely to Lisbon in October 1641. For the next three years he was employed in various important military commissions and further busied himself in defending by his pen the king's title to his newly acquired throne. An intrigue with the beautiful countess of Villa Nova, and her husband's jealousy, led to his arrest on the 19th of November 1644 on a false charge of assassination, and he lay in prison about nine years. Though his innocence was clear, the court of his Order, that of Christ, influenced by his enemies, deprived him of his *commenda* and sentenced him to perpetual banishment in India with a heavy money fine, and the king would not intervene to save him. Owing perhaps to the intercession of the queen regent of France and other powerful friends, his sentence was finally commuted into one of exile to Brazil. During his long imprisonment he finished and printed his history of the Catalonian War, and also wrote and published a volume of Spanish verses and some religious treatises, and composed in Portuguese a volume of homely philosophy, the *Carta de Guia de Casados* and a *Memorial* in his own defence to the king, which Herculano considered "perhaps the most eloquent piece of reasoning in the language." During

his exile in Brazil, whither he sailed on the 17th of April 1655, he lived at Bahia, where he wrote one of his *Epanaphoras de varia historia* and two parts of his masterpiece, the *Apologos dialogaes*. He returned home in 1659, and from then until 1663 we find him on and off in Lisbon, frequenting the celebrated *Academia dos Generosos*, of which he was five times elected president. In the last year he proceeded to Parma and Rome, by way of England, and France, and Alphonso VI. charged him to negotiate with the Curia about the provision of bishops for Portuguese sees and to report on suitable marriages for the king and his brother. During his stay in Rome he published his *Obras morales*, dedicated to Queen Catherine, wife of Charles II. of England, and his *Cartas familiares*. On his way back to Portugal he printed his *Obras metricas* at Lyons in May 1665, and he died in Lisbon the following year.

Manuel de Mello's early Spanish verses are tainted with Gongorism, but his Portuguese sonnets and *cartas* on moral subjects are notable for their power, sincerity and perfection of form. He strove successfully to emancipate himself from foreign faults of style, and by virtue of his native genius, and his knowledge of the traditional poetry of the people, and the best Quinhentista models, he became Portugal's leading lyric poet and prose writer of the 17th century. As with Camoens, imprisonments and exile contributed to make Manuel de Mello a great writer. His *Letters*, addressed to the leading nobles, ecclesiastics, diplomats and literati of the time, are written in a conversational style, lighted up by flashes of wit and enriched with apposite illustrations and quotations. His commerce with the best authors appears in the *Hospital das lettras*, a brilliant chapter of criticism forming part of the *Apologos dialogaes*. His comedy in *redondilhas*, the *Auto do Fidalgo Aprendiz*, is one of the last and quite the worthiest production of the school of Gil Vicente, and may be considered an anticipation of Molière's *Le Bourgeois gentilhomme*.

There is no uniform edition of his works, but a list of them will be found in his *Obras morales*, and the various editions are set out in Innocencio da Silva's *Diccionario bibliographico portugues*. See *Dom Francisco Manuel de Mello, his Life and Writings*, by Edgar Prestage (Manchester, 1905), "D. Francisco Manuel de Mello, documentos biographicos" and "D. Francisco Manuel de Mello, obras autographas e ineditas," by the same writer, in the *Archivo historico portuguez* for 1909. Manuel de Mello's prose style is considered at length by G. Cirot in *Mariana historien* (Bordeaux, 1905). pp. 378 seq.

(E. Pr.)

MANUL (*Felis manul*), a long-haired small wild cat from the deserts of Central Asia, ranging from Tibet to Siberia. The coat is long and soft, pale silvery grey or light buff in hue, marked with black on the chest and upper parts of the limbs, with transverse stripes on the loins and rings on the tail of the same hue. The Manul preys upon small mammals and birds. A separate generic name, *Trichaelurus*, has been proposed for this species by Dr K. Satunin.

MANURES AND MANURING. The term "manure" originally meant that which was "worked by hand" (Fr. *manœuvre*), but gradually came to apply to any process by which the soil could be improved. Prominent among such processes was that of directly applying "manure" to the land, manure in this sense being what we now call "farmyard manure" or "dung," the excreta of farm animals mixed with straw or other litter. Gradually, however, the use of the term spread to other materials, some of home origin, some imported, some manufactured by artificial processes, but all useful as a means of improving the fertility of the soil. Hence we have two main classes of manures: (*a*) what may be termed "natural manures," and (*b*) "artificial manures." Manures, again, may be divided according to the materials from which they are made—*e.g.* "bone manure," "fish manure," "wool manure," &c.; or according to the constituents which they mainly supply—*e.g.* "phosphatic manures," "potash manures," "nitrogenous manures," or there may be numerous combinations of these to form mixed or "compound" manures. Whatever it be, the word "manure" is now generally applied to anything which is used for fertilizing the soil. In America the term "fertilizers" is more generally adopted, and in Great Britain the introduction of the "Fertilizers and Feeding Stuffs Act" has effected a certain amount of change in the same direction. The modern tendency to turn attention less to the consideration of manurial applications given to land and more to the physical and mechanical changes introduced thereby in the soil itself, would seem to be carrying the word "manure" back more to its original meaning.

The subject of manures and their application involves a prior consideration of plant life and its requirements. The plant, growing in the soil, and surrounded by the atmosphere, derives from these two sources its nourishment and means of growth through the various stages of its development.

Chemical analysis has shown that plants are composed of water, organic or combustible matters, and inorganic or mineral matters. Water constitutes by far the greater part of a living plant; a grass crop will contain about 75% of water, a turnip crop 89 or 90%. The organic or combustible matters are those which are lost, along with the water, when the plant is burnt; the inorganic or mineral matters are those which are left behind as an "ash" after the burning. The combustible matter is composed of six elements: carbon, hydrogen, oxygen, nitrogen, sulphur and a little phosphorus. About one-half of the combustible matter of plants is carbon. Along with hydrogen and oxygen the carbon forms the cellulose, starch, sugar, &c., which plants contain, and with these same elements and sulphur the carbon forms the albuminoids of plants. The inorganic or mineral matters comprise a comparatively small part of the plant, but they contain, as essential constituents of plant life, the following elements: potassium, calcium, magnesium, iron, phosphorus and sulphur. In addition, other, but not essential, elements are found in the ash *e.g.* sodium, silicon and chlorine, together with small quantities of manganese and other rarer elements.

The above constituents that have been classed as “essential,” are necessary for the growth of the plant, and absence of any one will involve failure. This has been shown by growing plants in water dissolved in which are salts of the elements present in plants. By omitting in turn one or other of the elements aforesaid it is found that the plants will not grow after they have used up the materials contained in the seed itself. These elements are accordingly termed “essential,” and it therefore becomes necessary to inquire how they are to be supplied.

The atmosphere is the great storehouse of organic plant food. The leaves take up, through their stomata, the carbonic acid and other gases of the atmosphere. The carbonic acid, under the influence of light, is decomposed in the chlorophyll cells, oxygen is given off and carbon is assimilated, being subsequently built up into the various organic bodies forming the plant’s structure. It would seem, too, that plants can take up a small quantity of ammonia by their leaves, and also water to some extent, but the free or uncombined nitrogen of the air cannot be directly assimilated by the leaves of plants.

From the soil, on the other hand, the plant obtains, by means of its roots, its mineral requirements, also sulphur and phosphorus, and nearly all its nitrogen and water. Carbon, too, in the case of fungi, is obtained from the decayed vegetable matter in the soil. The roots are able not only to take up soluble salts that are presented to them, but they can attack and render soluble the solid constituents of the soil, thus transforming them into available plant food. In this way important substances, such as phosphoric acid and potash, are supplied to the plant, as also lime. Roots can further supply themselves with nitrogen in the form of nitrates, the ammonia and other nitrogenous bodies undergoing ready conversion into nitrates in the soil. These various mineral constituents, being now transferred to the plant, go to form new tissue, and ultimately seed, or else accumulate in the sap and are deposited on the older tissue.

Whether the nitrogen of the air can be utilized by plants or not has been long and strenuously discussed, Boussingault first, and then Lawes, Gilbert and Pugh, maintaining that there was no evidence of this utilization. But it was always recognized that certain plants, clover for example, enriched the land with nitrogen to an extent greater than could be accounted for by the mere supply to them of nitrates in the soil. Ultimately Hellriegel supplied the explanation by showing that, at all events, certain of the Leguminosae, by the medium of swellings or “nodules” on their roots, were able to fix the atmospheric nitrogen in the soil, and to convert it into nitrates for the use of the plant. This was found to be the result of the action of certain organisms within the nodules themselves, which in turn fed upon the carbohydrates of the plant and were thus living in a state of “symbiosis” with it. So far, however, this has not been shown to be the case with any other plants than the Leguminosae, and, though it is asserted by some that many other plants can take up the nitrogen of the air directly through their leaves, there is no clear evidence as yet of this.

We must now consider how the different requirements of the plant in regard to the elements necessary to maintain its life and to build up its structure affect the question of manuring.

Under conditions of natural growth and decay, when no crops are gathered in, or consumed on the land by live stock, the herbage, on dying down and decaying, returns to the atmosphere and the soil the elements taken from them during life; but, under cultivation, a succession of crops deprives the land of the

constituents which are essential to healthy and luxuriant growth. Without an adequate return to the land of the matters removed in the produce, its fertility cannot be maintained for many years. In newly opened countries, where old forests have been cleared and the land brought under cultivation, the virgin soil often possesses at first a high degree of fertility, but gradually its productive power decreases from year to year. Where land is plentiful and easy to be obtained it is more convenient to clear fresh forest land than to improve more or less exhausted land by the application of manure, labour and skill. But in all densely peopled countries, and where the former mode of cultivation cannot be followed, it is necessary to resort to artificial means to restore the natural fertility of the land and to maintain and increase its productiveness. That continuous cropping without return of manure ends in deterioration of the soil is well seen in the case of the wheat-growing areas in America. Crops of wheat were taken one after another, the straw was burned and nothing was returned to the land; the produce began to fall off and the cultivators moved on to fresh lands, there to meet, in time, with the same experience; and now that the available land has been more or less intensely occupied, or that new land is too far removed for ready transport of the produce, it has been found necessary to introduce the system of manuring, and America now manufactures and uses for herself large quantities of artificial and other manures.

That the same exhaustion of soil would go on in Great Britain, if unchecked by manuring, is known to every practical farmer, and, if evidence were needed, it is supplied by the renowned Rothamsted experiments of Lawes and Gilbert, on a heavy land, and also by the more recent Woburn experiments of the Royal Agricultural Society of England, conducted on a light sandy soil. The following table will illustrate this point, and show also how under a system of manuring the fertility is maintained:—

TABLE 1.—Showing Exhaustion of Land by continuous Cropping without Manure, and the maintenance of fertility through manuring. (Rothamsted 50 years; Woburn 30 years.)

1. Rothamsted (heavy land).									
Crop.	Plot.	Treatment	Average yield of corn per acre.						
			8 years, 1844-1851.	10 years, 1852-1861.	10 years, 1862-1871.	10 years, 1872-1881.	10 years, 1882-1891.	10 years, 1892-1901.	Average of 50 years, 1852-1901.
			Bush.	Bush.	Bush.	Bush.	Bush.	Bush.	Bush.
Wheat	3	Unmanured continuously	17.2	15.9	14.5	10.4	12.6	12.3	43.1
	2	Farm-yard manure yearly	28.0	34.2	37.5	28.7	38.2	39.2	35.6
Barley	7-2	Unmanured continuously	—	22.4	17.5	13.7	12.7	10.0	15.3
	1-0	Farm-yard manure yearly	—	45.0	51.5	50.2	47.6	44.3	47.7

2. Woburn (light land).						
Crop.	Plot.	Treatment.	Average yield of corn per acre.			
			10 years, 1877-1886.	10 years, 1887-1896.	10 years, 1897-1906.	Average of 30 years, 1877-1906.
			Bush.	Bush.	Bush.	Bush.
Wheat	7	Unmanured continuously	17.4	14.5	10.8	14.2
	11b	Farm-yard manure yearly	26.7	27.8	24.0	26.2
Barley	7	Unmanured continuously	23.0	18.1	13.3	18.1
	11b	Farm-yard manure yearly	40.0	39.9	36.6	38.8

Whereas on the heavier and richer land of Rothamsted the produce of unmanured wheat has fallen in 58 years from 17.2 bushels to 12.3 bushels, on the lighter and poorer soil of Woburn it has fallen in 30 years

from 17.4 bushels to 10.8 bushels; barley has in 50 years at Rothamsted gone from 22.4 bushels to 10 bushels, whilst at Woburn (which is better suited for barley) it has fallen in 30 years from 23 bushels to 13.3 bushels. At both Rothamsted and Woburn the application of farm-yard manure has kept the produce of wheat and barley practically up to what it was at the beginning, or even increased it. Similar conclusions can be drawn from the use of artificial manures at each of the experimental stations named, exemplifying the fact that with suitable manuring crops of wheat or barley can be grown years after year without the land undergoing deterioration, whereas if left unmanured it gradually declines in fertility. Practical proof has further been given of this in the well-known "continuous corn-growing" system pursued, in his regular farming, by Mr John Prout of Sawbridgeworth, Herts, and subsequently by his son, Mr W. A. Prout, since the year 1862. By supplying, in the form of artificial manures, the necessary constituents for his crops, Mr Prout was enabled to grow year after year, with only an occasional interval for a clover crop and to allow of cleaning the land, excellent crops of wheat, barley and oats, and without, it may be added, the use of farm-yard manure at all.

In considering the economical use of manures on the land regard must be had to the following points: (1) the requirements of the crops intended to be cultivated; (2) the physical condition of the soil; (3) the chemical composition of the soil; and (4) the composition of the manure. Briefly stated, the guiding principle of manuring economically and profitably is to meet the requirements of the crops intended to be cultivated, by incorporating with the soil, in the most efficacious states of combination, the materials in which it is deficient, or which the various crops usually grown on the farm do not find in the land in a sufficiently available condition to ensure an abundant harvest. Soils vary greatly in composition, and hence it will be readily understood that in one locality or on one particular field a certain manure may be used with great benefit, while in another field the same manure has little or no effect upon the produce.

For plant life to thrive certain elements are necessary, viz. carbon, hydrogen, oxygen, nitrogen, sulphur, phosphorus, among the organic or combustible matters, and among the inorganic or mineral matters, potassium, calcium, magnesium, iron, phosphorus and sulphur. We must now examine the extent to which these necessary elements occur in either of the two great storehouses, the atmosphere and the soil, and how their removal in the form of crops may be made up for by the use of manures, so that the soil may be maintained in a state of fertility. Further, we must consider what functions these elements perform in regard to plant life, and, lastly, the forms in which they can best be applied for the use of crops.

Of carbon, hydrogen and oxygen there is no lack, the atmosphere providing carbonic acid in abundance, and rain giving the elements hydrogen and oxygen, so that these are supplied from natural sources. Iron, magnesium and sulphur also are seldom or never deficient in soils, and do not require to be supplemented by manuring. Accordingly, the elements for which there is the greatest demand by plants, and which the soil does not provide in sufficiency, are nitrogen, phosphorus, potassium, and, possibly, calcium. Manuring, apart from the physical and mechanical advantages which it confers upon soils, practically resolves itself, therefore, into the supply of nitrogen, phosphorus and potassium, and it is with the supply of these that we shall accordingly deal in particular.

1. *Nitrogen.*—Though we are still far from knowing what are the exact functions which nitrogen fulfils in plant life, there is no doubt as to the important part which it plays in the vegetable growth of the plant and in the formation of stem and leaf. Without a sufficiency of nitrogen the plant would be stunted in growth. Its growth, indeed, may be said to be measured by the supply of nitrogen, for

while mineral constituents like phosphoric acid and potash are only taken up to the extent that the plant can use them *i.e.* according to its rate of growth, this actual growth itself would seem to be determined by the extent of the nitrogen supply. This it is which causes the ready response given to a crop by the application of some quickly-acting nitrogenous material like nitrate of soda, and which is marked by the dark-green colour produced and the pushing-on of the growth. Similarly, this use of nitrogen, by prolonging growth, defers maturity, while over-use of nitrogen tends to produce increase of leaf and lateness of ripening. Along with this growth of the vegetative portions, and seen, in the case of corn crops, mainly in the straw, there is a corresponding decrease, from the use of nitrogen in excess, in the quality of the grain. In corn a smaller grain and lesser weight per bushel are the result of over-nitrogen manuring. The composition of the grain is likewise affected, becoming more nitrogenous. With crops, however, where rapid green growth is required, nitrogen effects the purpose well, though here, too, over-manuring with nitrogen will tend to produce rankness and coarseness of growth. Experiments at Rothamsted and elsewhere, as well as everyday practice of the farm, bear testimony to the paramount importance of nitrogen-supply, and to the crops it is capable of raising. This applies not only to corn crops of all kinds, but to root crops, grass, potatoes, &c. Leguminous crops alone seem to have no need of it. In view of this practical experience, Liebig's "mineral theory"—according to which he laid down that plants only needed to have mineral constituents, such as phosphoric acid, potash and lime, supplied to them—reads strangely nowadays. The use of mineral manures without nitrogen other than that already present in the soil or supplied in rain has been shown, alike at Rothamsted and Woburn, to produce crops of wheat and barley little better than those from unmanured land. The lack of nitrogen in ordinary cultivated soils is much more marked than is that of mineral constituents, and consequently even with the application of nitrogen alone (as by the use of nitrate of soda or sulphate of ammonia), good crops have been grown for a large number of years. This has been shown both at Rothamsted and at Woburn. On the other hand, experiments at these stations have demonstrated that better and more lasting results are obtained by the judicious use of nitrogenous materials in conjunction with phosphates and potash.

The form in which nitrogen is taken up by plants is mainly, if not wholly, that of nitrates, which are readily-soluble salts. Ammonia and other nitrogenous bodies undergo in the soil, through the agency of nitrifying organisms present in it (*Bacterium nitrificans*, &c.), rapid conversion into nitrates, and as such are easily assimilable by the plant. Similarly, they are the constituents which are most readily removed in drainage, and hence the adequate supply of nitrogen for the plant's use is a constant problem in agriculture. Experiments on the rate of removal of nitrates from the soil by drainage showed that every inch of rain passing through the drains caused a loss of 2½ lb of nitrogen per acre (Voelcker and Frankland). At the same time, soils, as Way showed, have the power of absorbing, in different degrees, ammonia from its solution in water, and when salts of ammonia are passed through soils the ammonia alone is absorbed, the acids passing, generally in combination with lime, into the drainage.

Other experiments at Rothamsted on drainage showed that, though large quantities of ammonia salts were applied to the land, the drainage water contained merely traces of ammonia, but, on the other hand, nitrates in quantity, thus proving that it is as nitrates, and not as ammonia, that plants mainly, if not entirely, take up their nitrogenous food.

From these investigations it follows that much more nitrogen must be added to the land than would be needed to produce a given increase in the crop. Nitrogen, then, being so all-important, the question is, where is it to come from? We have seen that the leaves take up only minute quantities of ammonia, comparatively small amounts are supplied in the rain, dew, snow, &c.,[1] and in the case of Leguminosae alone have we any evidence of plants being able to provide themselves with nitrogen from atmospheric sources. Some few organisms present in fertile soils, *e.g. Azotobacter chroococcum*, have also the power, under certain conditions, of fixing the free nitrogen of the atmosphere without the intervention of a "host," but all these sources would be very inadequate to meet the demands of an intensive cultivation. An ordinary fertile arable soil will not show, on analysis, much more than .15% of nitrogen, and it is evident that the great source of supply of the needed nitrogen must be the direct manuring of the soil with materials containing nitrogen. These materials will be considered in detail later.

2. *Phosphorus.*—This is the most important mineral element which has to be supplied to the soil by the agency of manuring. It occurs in ordinary fertile soils to the extent of only about .15%, reckoned as phosphoric acid, and though its absence in sufficiency is not so marked or so soon shown under prolonged cultivation as is that of nitrogen, yet the fact that it is needed by all classes of crops, and that its application in manurial form is attended with great benefits, makes its supply one of great importance. From the time that Liebig, in 1840, suggested the treatment of bones with sulphuric acid in order to make them more readily available for the use of crops, and that the late Sir John Lawes (in 1843) began the dissolving of mineral phosphates for the purpose of manufacturing superphosphate, the "artificial manure" trade took its rise, and ever since then the whole globe has been exploited for the purpose of obtaining the raw phosphatic materials which form the base of the artificial manures of the past and of the present day. The functions which phosphoric acid fulfils in plant life would appear to be connected rather with the maturing of the plant than with the actual growth of the structure. Phosphates are found concentrated in those parts of the plant where cell growth and reproduction are most active. More especially is this the case with the seed in which phosphates are present in greatest quantity. While nitrogen delays maturity, phosphoric acid has just the opposite effect, and cereal crops not sufficiently supplied with it ripen much more tardily than do others. Moreover, the grain is formed more early when phosphatic manures have been given than when they are withheld. Phosphates increase the proportion of corn to straw, and, as regards the grain itself, they render it less nitrogenous, richer in phosphates, and altogether improve its quality.

While these are the principal functions of phosphates, they also exercise an influence on the young plant in its early stages. This is well seen in the almost universal practice of applying superphosphate to the young turnip or swede crop in order to push it beyond the attack of "fly." Undoubtedly phosphates in readily available form stimulate the young seedling, enabling it to develop root growth, and, later on, causing the plant to "tiller out" well. Phosphoric acid occurs in the soil bound up with the oxides of iron and alumina, or, it may be, with lime, and the extent to which it may become useful to plants will depend largely upon the readiness with which it becomes available. For the purpose of ascertaining this different analytical methods have been suggested, the best known one being that of B. Dyer, in which a 1% solution of citric acid is used as a solvent. As a result of experimenting with Rothamsted soils of known capability it has been put forward that if a soil shows, by this treatment, less than .01% of phosphoric acid it is in need of phosphatic manuring.

Experiments carried on for many years at Rothamsted and Woburn have clearly established the beneficial effects of phosphatic manuring on corn crops, for though no material increase marks the application of mineral manures in the absence of nitrogen, yet the results when phosphates and nitrogen are used together are very much greater than when nitrogen alone has been applied; and this is true as regards not only the better ripening and quality of the grain, but also as regards the actual crop increase.

With root crops phosphates are almost indispensable; and, owing to the limited power which these crops have of utilizing the phosphoric acid in the soil, the supply of a readily available phosphatic manure like superphosphate is of the highest importance.

The assimilation of phosphoric acid goes on in a cereal crop after the time of flowering and to a later date than does that of nitrogen and potash, and it is ultimately stored in the seed. Soils possess a retentive power for phosphoric acid which enables the latter to be conserved and not removed to any extent by drainage. This function is exercised mainly by the presence of oxide of iron. Alumina acts in a similar way. In the case of soils that contain clay only traces of phosphoric acid are found in the drainage water.

3. *Potassium.*—The element third in importance, which requires to be supplied by manuring, is potassium, or, as it is generally expressed, potash. This in its functions resembles phosphoric acid somewhat, being concerned rather with the mature development of the plant than with its actual increase of growth. Like phosphoric acid, potash is found concentrated throughout the plant in the early stages of its growth, but, unlike it, is in the case of a cereal crop all taken up by the time of full bloom, whereas with phosphoric acid the assimilation continues later. Potash would appear to have an intimate connexion with the quality of crops, and to be favourable to the production of seed and fruit rather than to stem and leaf development. Certain crops, such as vegetables, fruit, hops, as well as root crops generally, make special demands upon potash supply, and, as checking the tendency to over-development of leaf, &c., induced by nitrogenous manures when used alone, potash has great practical importance. Potash appears to be bound up in a special way with the process of assimilation, for it has been clearly shown that whenever potash is deficient the formation of the carbohydrates, such as sugar, starch and cellulose, does not go on properly. Hellriegel and Wilfarth showed by experiment the dependence of starch formation on an adequate supply of potash. Cereal grains remained small and undeveloped when potash was withheld, because the formation of starch did not go on. The same effect has been strikingly shown in the Rothamsted experiments with mangels, a plot receiving potash salts as manure giving a crop of roots nearly 2½ times as heavy as that grown on a plot which has received no potash. In this case the increase is due almost entirely to the sugar and other carbohydrates elaborated in the leaves, and not to any increase of mineral constituents.

The effect of potash on maturity is somewhat uncertain, inasmuch as in the case of grain crops it would appear to delay maturity and to hasten it in that of root crops.

The influence of potash on particular crops is very marked. On clovers and other leguminous crops it is highly beneficial, while on grass land it is of particular importance as inducing the spread of clovers and other leguminous herbage. This is well seen in the Rothamsted grass experiments,

where with a mineral manure containing potash one-half of the herbage is leguminous in nature, whereas the same manure without potash gives only 15% of leguminous plants. Similarly, where nitrogen is used by itself and no potash given there are no leguminous plants at all to be found. Potash occurs in an ordinary fertile soil to the extent of about .20%; a sandy soil will have less, a clay soil may have considerably more. Potash, however, is mostly bound up in the soil in the form of insoluble silicates, and these are often in a far from available form, but require cultivation, the use of lime and other means for getting them acted on by the air and moisture, and so liberating the potash. According to B. Dyer's method of ascertaining the availability of potash in soils, the amount of potash soluble in a 1% citric acid solution should be about .005%, otherwise the addition of potash manures will be a requisite. In the case of soils containing much lime a larger quantity would, no doubt, be needed.

Potash, like phosphoric acid, is readily retained by soils, and so is not subject to any considerable losses by drainage. This retention is exercised by the ferric-oxide and alumina in soils, but still more so by the double silicates, and to some extent also by the humus of the soil. Potash will be liberated from its salts by the action of lime in the soil, the lime taking the place of the potash. Lime is, therefore, of much importance in setting free fresh stores of potash. Soda salts also, when in considerable excess, are able to liberate potash from its compounds, and to this is probably due, in many cases, the beneficial action attending the use of common salt.

4. *Calcium.*—Though calcium, or lime, is found in sufficiency in most cultivated soils, there are, nevertheless, soils in which lime is clearly deficient and where that deficiency has shown itself in practice. Moreover, so comparatively easy is the removal of lime from the soil by drainage, and so important is the part which lime plays in liberating potash from its compounds, and in helping to retain bases in the soil so that they are not lost in drainage, that the significance of lime cannot be ignored. Further, the availability of both potash and phosphoric acid in the soil has been found to be much increased by the presence of lime. Lime, as carbonate of calcium, is also necessary for the process of nitrification to go on in the soil. Some sandy soils, and even some clays, contain so little lime as to call for the direct supply of lime as an addition to the soil. When this is the case nothing can adequately take the place of lime, and in this sense lime may be called a "manure." In the majority of cases, however, the practice of liming or chalking, which was a common one in former times, was resorted to mainly because of the ameliorating effects it produced on the land, both in a mechanical and in a physical direction. Thus, on clay soil it flocculates the particles, rendering the soil less tenacious of moisture, improving the drainage and making the soil warmer. Nor must the directly chemical results be overlooked, for in addition to those already mentioned, of liberating plant food (chiefly potash and phosphoric acid), retaining bases, and aiding nitrification, lime acts in a special way as regards the sourness or "acidity" which is sometimes produced in land when lime is deficient. In soils that are acid through the accumulation of humic acid nitrification does not go on, and bacterial life is repressed. The addition of lime has the effect of "sweetening" the land, and of restoring its bacterial activity. This acidity is also seen in the occurrence of the disease known as "finger and toe" in turnips, the fungus producing this being one that thrives in an acid soil. It is only found in soils poor in lime, and the only remedy for it is liming. The growth of weeds like spurry, marigold, sorrel, &c., is also a sign of land being wanting in lime. The most striking instance of this "soil acidity" is that afforded by the Woburn experiments, where, on a soil originally poor in lime,

the soil has, through the continuous use of ammonia salts, been impoverished of its lime to such an extent that it has become quite sterile and is distinctly acid in character. The application of lime, however, to such a soil has had the effect of quite restoring its fertility.

The amount of lime which soils contain is a very variable one, chalk soils being very rich in lime, whereas sandy and peaty soils are generally very poor in it. If the amount of lime in a soil falls below 1% of carbonate of lime on the dried soil, the soil will sooner or later require liming.

5. *Magnesium.*—This is not known to be deficient in soils, although an essential element in them, and it is seldom directly applied as a manurial ingredient. Some natural potash salts, such as kainit, contain magnesia salts in considerable quantity; but their influence is not known to be of beneficial nature, though, like common salt, magnesia salts will, doubtless, render some of the potash in the soil available. At the same time magnesia salts are not without their influence on crops, and experiments have been undertaken at the Woburn experimental farm and elsewhere to determine the nature of this influence. Carbonate of magnesia has been tried in connexion with potato-growing, and, it is said, with good results.

6. *Iron.*—Iron is another essential ingredient of soil that is found in abundance and does not call for special application in manurial form. Iron is essential for the formation of chlorophyll in the leaves, and its presence is believed also to be beneficial for the development of colour in flowers, and for producing flavour in fruits and in vines especially. Ferrous sulphate has, partly with this view, and partly for its fungus-resisting properties, been suggested as a desirable constituent of manures. The function performed by ferric oxide in the soil of retaining phosphoric acid, potash and ammonia has been already alluded to.

7. *Sulphur.*—This, the last of the "essential" elements, is seldom specially employed in manurial form. There would appear to be no lack of it for the plant's supply, and it is little required except for the building-up, with carbon, hydrogen, oxygen and nitrogen, of the albuminoids. There are few artificial manures which do not contain considerable amounts of sulphur, notably superphosphate. Sulphate of lime (gypsum) is sometimes applied to the land direct as a way of giving lime; this is employed in the case of clover and hops principally.

Having thus dealt with the essential ingredients which plants must have, and which may require to be supplied to them in the form of additional manures, we may briefly pass over the other constituents found in plants, which may, or may not, be given as manures.

8. *Sodium.*—This is a widely distributed element. The influence of common salt (chloride of sodium) in liberating, when used in large excess, potash from the silicates in which it is combined in the soil has been already referred to, and in this way common salt and also nitrate of soda (the two forms in which soda salts are used as manures) may have some benefit. The principal purpose for which common salt, however, is used, is that of retaining moisture in the land. It is specially useful in a dry season, or for succulent crops such as cabbage, kale, &c., or again for plants of maritime origin (such as mangels), which thrive near the sea shore.

9. *Silicon.*—All soils contain silica in abundance. Though silica forms so large a part of the ash of plants and is especially abundant in the straw of cereals, there is no evidence that it is required in

plant life. Popularly, it is believed to "stiffen" the stems of cereals and grasses, but plants grown without it will do perfectly well. It would, however, appear that soluble silica does play some part in enabling phosphoric acid to be better assimilated by the plant. Silicates, however, have not justified their use as direct fertilizers.

10. *Chlorine.*—A certain amount of chlorine is brought down in the rain, and chlorides are also used in the form of common salt, with the effect, as aforesaid, of liberating potash from silicates, when given in excess, but there is no evidence as to any particular part which the chlorine itself plays.

11. *Manganese*, &c.—Manganese occurs in minute quantities in most plants, and it, along with lithium (found largely in the tobacco-plant), caesium, titanium, uranium and other rare elements, may be found in soils. Experiments at the Woburn pot-culture station and elsewhere, point to stimulating effects on vegetation produced by the action of minute doses of salts of these elements, but, so far, their use as manurial ingredients need not be considered in practice.

12. *Humus.*—Though not an element, or itself essential, this body, which may be described as decayed vegetable matter, is not without importance in plant life. Of it, farm-yard manure is to a large extent composed, and many "organic manures," as they are termed, contain it in quantity. Dead leaves, decayed vegetation, the stubble of cereal crops and many waste materials add humus to the land, and this humus, by exposure to the air, is always undergoing further changes in the soil, opening it out, distributing carbonic acid through it, and supplying it, in its further decomposition, with nitrogen. The principal effects of humus on the soil are of a physical character, and it exercises particular benefit through its power of retaining moisture. Humus, however, has a distinct chemical action, in that it forms combinations with iron, calcium and ammonia. It thus becomes one of the principal sources of supply of the nitrogenous food of plants, and a soil rich in humus is one rich in nitrogen. The nitrogen in humus is not directly available as a food for plants, but many kinds of fungi and bacteria are capable of converting it into ammonia, from which, by the agency of nitrifying organisms, it is turned into nitrates and made available for the use of plants. Humus is able to retain phosphoric acid, potash, ammonia and other bases. So important were the functions of humus considered at one time that on this Thaer built his "humus theory," which was, in effect, that, if humus was supplied to the soil, plants required nothing more. This was based, however, on the erroneous belief that the carbon, of which the bulk of the plant consists, was derived from the humus of the soil, and not, as we now know it to be, from the carbonic acid of the atmosphere. This theory was in turn replaced by the "mineral theory" of Liebig, and then both of them by the "nitrogen theory" of Lawes and Gilbert.

We pass next to review, in the light of the foregoing, the manures in common use at the present day.

Manures, as already stated, may be variously classified according to the materials they are made from, the constituents which they chiefly supply, or the uses to which they are put. But, except with certain few manures, such as nitrate of soda, sulphate of ammonia and potash salts, which are used purely for one particular purpose, it is impossible to make any definite classification of manures, owing to the fact that the majority of them serve more than one purpose, and contain more than one fertilizing constituent of value. It is only on broad lines, therefore, that any division can be framed. Between so-called "natural"

manures like farm-yard manure, seaweed, wool waste, shoddy, bones, &c., which undergo no particular artificial preparation, and manufactured manures like superphosphate, dissolved bones, and other artificially prepared materials, there may, however, be a distinction drawn, as also between these and such materials as are imported and used without further preparation, *e.g.* nitrate of soda, kainit, &c. On the whole, the best classification to attempt is that according to the fertilizing constituents which each principally supplies, and this will be adopted here, with the necessary qualifications.

I.—Nitrogenous (wholly or mainly) Manures

These divided themselves into: (*a*) Natural nitrogenous manures; (*b*) imported or manufactured manures.

a. Natural Nitrogenous Manures

Under this heading come—farm-yard manure; seaweed; refuse cakes and meals; wool dust and shoddy; hoofs and horns; blood; soot; sewage sludge.

Farm-yard Manure.—This is the most important, as well as the most generally used, of all natural manures. It consists of the solid and liquid excreta of animals that are fed at the homestead, together with the material used as litter. The composition of farm-yard manure will vary greatly according to the conditions under which it is produced. The principal determining factors are (1) the nature and age of the animals producing it, (2) the food that is given them, (3) the kind and quantity of litter used, (4) whether it be made in feeding-boxes, covered yards or open yards, (5) the length of time and the way in which it has been stored. The following analysis represents the general composition of well-made farm-yard manure, in which the litter used is straw:—

Water	75.42
*Organic matter	16.52
Oxide of iron and alumina	.36
Lime	2.28
Magnesia	.14
Potash	.48
Soda	.08
**Phosphoric acid	.44
Sulphuric acid	.12
Chlorine	.02
Carbonic acid, &c.	1.38
Silica	2.76
	100.00
* Containing nitrogen = .59%, which is equal to ammonia	.72%
** Equal to phosphate of lime	.96

Put broadly, farm-yard manure will contain from 65 to 80% of water, from .45 to .65% of nitrogen, from .4 to .8% of potash, and from .2 to .5% of phosphoric acid.

This analysis shows that farm-yard manure contains all the constituents, without exception, which are required by cultivated crops in order to bring them to perfection, and hence it may be called a "perfect" manure. Dung, it may be observed, contains a great variety of organic and inorganic compounds of various degrees of solubility, and this complexity of composition—difficult, if not impossible, to imitate by art—is one of the circumstances which render farm-yard manure a perfect as well as a universal manure.

The excrements of different kinds of animals vary in composition, and those of the same animal will vary according to the nature and quantity of the food given, the age of the animal, and the way it is generally treated. Thus, a young animal which is growing, needs food to produce bone and muscle, and voids poorer dung than one which is fully grown and only has to keep up its condition. Similarly, a milking-cow will produce poorer dung than a fattening bullock. Again, cake-feeding will produce a richer manure than feeding without cake. Straw is the most general litter used, but peat-moss litter, sawdust, &c., may be used, and they will affect the quality of the manure to some extent. Peat-moss is the best absorbent and has a higher manurial value than straw. Box-fed manure, and that made in covered yards will suffer much less loss than that made in an open yard. Lastly, manure kept in a heap covered with earth will be much richer than that left in an uncovered heap. The solid and liquid excrements differ much in composition, for, while the former contain principally phosphoric acid, lime, magnesia, and silica and comparatively little nitrogen, the urine is almost destitute of phosphoric acid, and abounds in alkaline salts (including salts of potash) and in nitrogenous organic matters, among which are urea and uric acid, and which on decomposition yield ammonia. Unless, therefore, the two kinds of excrements are mixed, a perfect manure supplying all the needs of the plant is not obtained; care must accordingly be taken to absorb all the urine by the litter. Farm-yard manure, it is well known, is much affected by the length of time and the way in which it has been kept. Fresh dung is soluble in water only to a limited extent, and, in consequence, it acts more slowly on vegetation, and the action lasts longer than when dung is used which has been kept some time; fresh dung is therefore generally used in autumn or winter, and thoroughly rotten dung in spring, when an immediate forcing effect is required.

The changes which farm-yard manure undergoes on keeping, have been made the subject of much inquiry. In Germany, Maercker and Schneidewind; in France, Muntz and Girard; and in England, Voelcker, Wood, Russell and others, have investigated these losses, coming to very similar conclusions concerning them. Perhaps the most complete set of experiments is one conducted at the Woburn experimental station and extending over three years (1899-1901). The dung was cake-fed manure made in feeding-boxes from which no drainage issued, and, after removal, it was kept in a heap, covered with earth. Hence it was made under as good conditions as possible; but, even then, the losses—after deduction for live-weight increase of the animals—were found to be 15% of the total nitrogen of the food, during the making, and 34% (or a further 19%) during storing and by the time the manure came to be put on the land. Accordingly, under ordinary farm conditions it is quite clear that only about 50% of the nitrogen of the food given is recovered in the dung that goes on the

land. This is the figure which Lawes and Gilbert suggested in the practical application of their Tables of Compensation for Unexhausted Manure Value.

During the fermentation of dung a large proportion of the non-nitrogenous organic matters disappear in the forms of carbonic acid and water, while another portion is converted into humic acids which fix the ammonia gradually produced from the nitrogenous constituents of the solid and liquid excreta. The mineral matters remain behind entirely in the rotten dung, if care be taken to prevent loss by drainage. For proper decomposition, both air and moisture are requisite, while extreme dryness or too much water will arrest the due fermentation of the mass.

Well-fermented dung is more concentrated and consequently more efficacious than fresh farm-yard manure. Neither fresh nor rotten dung contains any appreciable quantity of volatile ammonia, and there is no advantage from applying gypsum, dilute acid, superphosphate, kainit, or other substances recommended as fixers of ammonia. If dung is carted into the field and spread out at once in thin layers it will suffer comparatively little loss. But if dung be kept for a length of time in shallow heaps, or in open straw-yards and exposed to rain, it loses by drainage a considerable proportion of its most valuable soluble fertilizing constituents. Experiments with farm-yard manure kept in an open yard showed that, after twelve months' exposure to the weather, nearly all the soluble nitrogen and 78.2% of the soluble mineral matters were lost by drainage (A. Voelcker). To prevent this loss, farm-yard manure, as had been pointed out, should, whenever possible, be carted into the field, spread out at once, and ploughed in at the convenience of the farmer. It is, however, not always practicable to apply farm-yard manure just at the time it is made, and, as the manure heap cannot be altogether dispensed with, it is necessary to see how the manure may best be kept. The best dung is that made in regular pits or feeding-boxes. In them the urine is thoroughly absorbed, and, the manure being more compact through the constant treading, air enters less freely and the decomposition goes on less rapidly, the volatile matters, in consequence, not being so readily lost. External agents, such as rain, wind, sun, &c., do not affect the manure as they would in the case of open yards. Next best to box-fed manure is that made in covered yards, then that in sheds, and lastly that in open yards. When removed from the box or yard, the manure should be put in a heap upon a floor of clay or well-beaten-down earth, and then be covered with earth. When kept in an open yard, care should be taken not to let spoutings of buildings lead on to it, and if there be a liquid-manure tank, this might be pumped out over the manure again when the latter is too dry.

The advantages of farm-yard manure consist, not only in its supplying all the constituents of plant food, but also in the improved physical condition of the soil which results from its application, inasmuch as the land is thereby kept porous, and air is allowed free access. While, however, farm-yard manure has these advantages, experience has shown that artificial manures, properly selected so as to meet the requirements of the crops intended to be grown on the particular land, may be employed to greater advantage. In farm-yard manure about two-thirds of the weight is water and one-third dry matter; a large bulk thus contains only a small proportion of fertilizing substances, and expense is incurred for carriage of much useless matter when dung has to be carted to distant fields. When a plentiful supply of good farm-yard manure can be produced on the farm or bought at a moderate price in the immediate neighbourhood, it is economy to use it either alone or in conjunction with artificial manures; but when food is dear and fattening does not pay, or farm-yard

manure is expensive to buy, it will be found more economical to use artificial manures. This has obtained confirmation from the experience of Mr Prout, at Sawbridgeworth, Herts, where since 1866, successive crops of corn have been grown, and entirely with the use of artificial manures.

The real difficulty with farm-yard manure is to get enough of it, and, if it were available in sufficiency, it would be safe to say that farmers generally would not require to go farther in regard to the manuring of any of the crops of the farm. Moreover, experiments at Rothamsted and Woburn have shown of how "lasting" a character farm-yard manure is, its influence having told for some 15 to 20 years after its application had ceased.

Light land is benefited by farm-yard manure through its supplying to the soil organic matter, and imparting to it "substance" whereby it becomes more consolidated and is better able to retain the manurial ingredients given to it. By improving the soil's moisture-holding capacity, moreover, "burning" of the land is prevented.

With heavy clay soils the advantages are that these are kept more open in texture, drainage is improved, and the soil rendered easier of working. On light land, well-rotted manure is best to apply; and in spring, whereas on heavy land freshly-made, "long," manure is best, and should be put on in autumn or winter.

Farm-yard manure, where the supply is limited, is mostly saved for the root-crop, which, however, generally needs a little superphosphate to start it, as farm-yard manure is not sufficiently rich in this constituent. It serves a great purpose in retaining the needed moisture in the soil for the root crop.

For potato-growing, for vegetables, and in market-gardening, farm-yard manure is almost indispensable. On grass-land and on clover-ley it is also very useful, and in the neighbourhood of large towns is employed greatly for the production of hay.

For corn crops also, and especially for wheat on heavy land, farm-yard manure is much used, and, in a dry season in particular, shows excellent results, though experiments at Rothamsted and Woburn have shown that, on heavy and light land alike, heavier crops of wheat and barley can be produced in average seasons by artificial manures.

Seaweed.—Along the sea-coast seaweed is collected, put in heaps and allowed to rot, being subsequently used on the land, just as farm-yard manure is. According to the nature of the weed and its water-contents, it may have from .3 to 1% of nitrogen, or more, with potash in some quantity.

Green-manuring.—Though properly belonging to cultivation rather than to manuring, and acting chiefly as a means of improving the condition of the soil, the practice of green-manuring carries with it manurial benefits also, in that it supplies humus and nitrogen to the soil, and provides a substitute for farm-yard manure. The ploughing-in of a leguminous green-crop which has collected nitrogen from the atmosphere should result in a greater accumulation of nitrogen for a succeeding corn-crop, and thus supply the cheapest form of manuring. Green-manuring is most beneficial on light land, poor in vegetable matter.

Manure Cakes, Malt Dust, Spent Hops, &c.—Many waste materials of this kind are used because of their supplying, in the form of nitrogenous organic matter, nitrogen for crop uses. The nitrogen in these is of somewhat slow-acting, but lasting, nature. In addition to nitrogen, some of these materials, *e.g.* rape cake, cotton cake and castor cake, contain appreciable amounts of phosphoric acid and potash. Rape cake, or "land cake," as it is called in Norfolk, is used considerably for wheat. It is also believed to be a preventive of wireworm, and so is often employed for potatoes and root-crops. Rape-seed from which the oil has been extracted by chemical means, and which is called "rape refuse," is made use of in hop-gardens as a slowly acting supplier of nitrogen. It will contain 4 to 5% of nitrogen with 3 to 4% of phosphates. Damaged cotton and other feeding-cakes, no longer fit for feeding, are ground into meal and put on the land. Castor cake is directly imported for manurial purposes, and will have up to 5% of nitrogen with 4 to 5% of phosphates. Spent hops, malt dust and other waste materials are similarly used. The principal use of these materials is on light land, and to give bulk to the soil while supplying nitrogen in suitable form.

Wool-dust, Shoddy, &c.—The clippings from wool, the refuse from cloth factories, silk, fur and hair waste, carpet clippings and similar waste materials are comprised in this category. They are valuable purely for their nitrogen, and should be purchased according to their nitrogen-contents. They are favourite materials with hop-growers and fruit-farmers, whose experience leads them to prefer a manure which supplies its nitrogen in organic form, and which acts continuously, if not too readily. It is the custom in hop-lands to manure the soil annually with large quantities of these waste materials till it has much fertility stored up in it for succeeding crops. According to its nature, wool-dust or shoddy may contain anything from 3% of nitrogen up to 14%.

Leather is another waste material of the same class, but the process of tanning it has undergone makes its nitrogen but very slowly available and it is avoided, in consequence, as a manure. There have been several processes started with the object of rendering leather more useful as a manure.

Hoofs and Horns.—The clippings and shavings from horn factories are largely used by some hop-growers, and, though very slow in their action, they will contain 14 to 15% of nitrogen. They are sometimes very finely ground and sold as "keronikon," chiefly for use in compound artificial manures.

Dried Blood is another purely nitrogenous material, which however seldom finds its way to the farmer, being used up eagerly by the artificial manure maker. It will contain from 12 to 14% of nitrogen. It is obtained by simply evaporating down the blood obtained from slaughter-houses. It is the most rapidly acting of the organic nitrogenous materials enumerated, and, when obtainable, is a favourite manure with fruit-growers, being also used for root and vegetable growing.

Soot is an article of very variable nature. It owes its manurial value mainly to the ammonia salts it contains, and a good sample will have about 4% of ammonia. It is frequently adulterated, being mixed with ashes, earth, &c. Flue sweepings of factory chimneys are sometimes sold as soot, but possess little value. Besides the ammonia that soot contains, there would undoubtedly seem to be a value attaching to the carbonaceous matter. Soot is a favourite top-dressing for wheat on heavy land, and is efficacious in keeping off slugs, &c. Speaking generally, the lighter a sample of soot is the more likely is it to be genuine.

Sewage Manure.—Where methods of dealing with the solid matters of sewage are in operation, it frequently happens that these matters are dried, generally with the aid of lime, and sold locally. Occasionally they are prepared with the addition of other fertilizing materials and made up as special manures. It may be taken for granted that sewage refuse by itself is not worth transporting to any distance. When made up with lime, the "sludge," as it is generally termed, is often useful because of the lime it contains. But, on the whole, the value of such preparations has been greatly exaggerated. Where land is in need of organic matter, or where it is desirable to consolidate light land by the addition of material of this class, sludge may, however, have decided value on mechanical and physical grounds, but such land requires to be near at hand.

b. Imported or Manufactured Nitrogenous Manures.

These are nitrate of soda; sulphate of ammonia; calcium cyanamide; calcium nitrate.

Nitrate of Soda.—This is the best known and most generally used of purely nitrogenous manures. It comes from the rainless districts of Chile and Peru, from which it was first shipped about the year 1830. By 1899 the export had reached to 1,344,550 tons. It is uncertain what its origin is, but it is generally believed to be the deposit from an ancient sea which was raised by volcanic eruption and its waters evaporated. Another theory puts it as the deposit from the saline residues of fresh-water streams. The crude deposit is termed *caliche*, and from this (which contains common salt and sulphates of soda, potash and lime) the nitrate is crystallized out and obtained as a salt containing 95 to 96% pure nitrate of soda. It is sold on a basis of 95% pure, and is but little subject to adulteration.

As a quickly acting nitrogenous manure nitrate of soda has no equal, and it is in great demand as a top-dressing for corn crops, also for roots. On grass-land, if used alone, it tends to produce grass but to exterminate leguminous herbage. Its tendency with corn crops is to produce, if used in quantity, inferiority of quality in grain. It can be employed in conjunction with superphosphate and other artificial manures, though it should not be mixed with them long before the mixture is to be put on. It is a very soluble salt, and the nitrogen being in the form of nitrates, it can be readily taken up by plants. On the other hand, it is readily removed from the soil by drainage, and its effects last only for a single season. Owing to its solubility, it requires to be used in much larger amount than the crop actually will take up. On a heavy soil it has a bad influence if used repeatedly and in quantity, causing the land to "run," and making the tilth bad. Though, doubtless, exhaustive to the soil, when used alone, there is no evidence yet of nitrate of soda causing land to "run out," as has been shown to be the case with sulphate of ammonia. One cwt. to the acre is a common dressing for corn crops, but for mangels it has been used to advantage up to 4 cwt. per acre. As a top-dressing for corn crops it differs little in its crop-results from its rival sulphate of ammonia, but in a dry season it answers better, owing to its more ready solubility and quicker action, whereas in a wet season sulphate of ammonia does better.

Sulphate of Ammonia.—This is the great competitor with nitrate of soda, and, like the latter, is useful purely as a nitrogenous manure. It is obtained in the manufacture of gas and as a by-product in the distillation of shale, &c., as also from coke ovens. By adding sulphuric acid to the ammoniacal liquor distilled over from the coal, &c., the salt is crystallized out. It is seldom

adulterated, and, as sold in commerce, generally contains 24 to 25% of ammonia. It is not quite so readily soluble as nitrate of soda; it does not act quite so quickly on crops, but is less easily removed from the soil by drainage, leaving also a slight amount of residue for a second crop. It is nearly as efficacious as a top-dressing for corn crops as is nitrate of soda, and for some crops, *e.g.* potatoes, it is considered superior. It may also be used like nitrate of soda for root crops. On grass-land its effect in increasing gramineous but reducing leguminous herbage is similar to that of nitrate of soda, but with corn crops it has not the same deteriorating influence on the quality of grain. It can be mixed quite well with superphosphate and other artificial manures, and is therefore a common form in which nitrogen is supplied in compound manures. It does not produce the bad effect on the tilth of certain soils that nitrate of soda does, but it is open to the objection that, if used continually on soil poor in lime, it will gradually exhaust the soil and leave it in an acid condition, so that the soil is unable to bear crops again until fertility is restored by the addition of lime. A usual dressing of sulphate of ammonia is 1 cwt. per acre.

Calcium Cyanamide.—This is a new product which represents the earliest result of the utilization, in a commercial form, of atmospheric nitrogen as a manurial substance. It is obtained by passing nitrogen gas over the heated calcium carbide obtained in the electric furnace, the nitrogen then uniting with the carbide to form calcium cyanamide. The product contains from 19 to 20% of nitrogen, and, though still under trial as a nitrogenous manure, it bids fair to form a valuable source of supply, especially should the natural deposits of nitrate of soda become exhausted. The cost of production limits its manufacture to places where electrical power can be cheaply generated. In its action it would seem to resemble most closely sulphate of ammonia.

Calcium Nitrate.—This is another product of the utilization of atmospheric nitrogen as a manurial agent. Nitrogen and oxygen are made to combine within the electric arc and the nitric acid produced is then combined with lime, forming nitrate of lime. Nitrate of lime contains, as put on the market, about 13% of nitrogen. In its action it should be very similar to nitrate of soda, with, possibly, some added benefit to certain soils by reason of the lime it contains. Like cyanamide, it is still in the experimental stage as regards its agricultural use, and can only be produced where electric power is cheaply obtainable.

Neither material is altogether free from objection, the cyanamide heating when mixed with other manures and even with soil, and being liable to give off acetylene gas owing to the presence of calcium carbide, whereas the calcium nitrate is a salt which on exposure to a moist atmosphere readily deliquesces.

II.—Phosphatic Manures

Under the heading of manures that are used purely for their phosphatic benefit to the soil are superphosphate and basic slag.

Superphosphate.—This is the typical phosphatic manure, and is the base of the numerous artificial manures used on the farm. Superphosphate is made by dissolving raw phosphatic minerals in sulphuric acid (oil of vitriol), the tribasic phosphate of lime which these contain being converted into the so-called “soluble phosphate,” sulphate of lime being formed at the same time. The first

impetus to the manufacture of superphosphate was given by Liebig, when he suggested, in 1840, the treatment of bones with oil of vitriol in order to make them act more quickly in the soil. Lawes subsequently, in 1843, applied this to mineral phosphates, using phosphorite, first of all, and the great manufacture of mineral superphosphate then began. Coprolites, as found in Cambridgeshire, Suffolk, Bedfordshire and elsewhere were the raw materials at first employed in the United Kingdom. But gradually the demand for the new manure became so great that distant parts of the world were searched to bring in the raw material for conversion into superphosphate. Many new sources of supply have been worked, and many worked out or abandoned in favour of better and richer phosphates. Among these were the crystalline apatites of Canada and Norway, French, Spanish and German (Lahn) phosphates, and, at a later period, Carolina (land and river), Florida, Tennessee, Somme, Belgian, Algerian and Tunisian phosphates. In addition to these came other materials which, in their origin, were really of the nature of guano, being bird deposits the ammoniacal matters of which were gradually washed out. The mineral matters remained and altered the composition of the original rock on which the guano was deposited, thus forming rich deposits of phosphate of lime. Such were the phosphates obtained from many of the islands of the West Indies and South Pacific, and known under such various names as Sombrero, Curaçao, Aruba, Maiden Island, Megillones, Baker Island, Fanning Islands, Lacepedes Islands, &c. guanos. Few of these are now worked, but their place has been largely taken by the rich deposits of Ocean Island and Christmas Island, which are of similar origin. The principal supplies of phosphatic minerals at the present time come from Florida, Algeria, Tunis, Ocean Island and Christmas Island. Other phosphates imported are Redonda and Alta Vela phosphates, but these consist mainly of phosphate of alumina, and are not used for superphosphate manufacture but for phosphorus production.

Coprolites, as formerly used, contained from 50 to 60% of phosphate of lime, but they are not worked now, the richer sources, which are also better adapted for superphosphate manufacture, having taken their place. The amount of oxide of iron and alumina in raw phosphates is of great importance, as phosphates containing these bodies are liable to cause superphosphate to “go back” or form what is called “reverted” phosphate, the percentage of “soluble phosphate” being reduced thereby. For this reason many of the older supplies have been replaced by newer and better ones. Florida rock phosphate of high grade contains 75 to 78% of phosphate of lime, and Florida land pebble phosphate about 70%. Algerian and Tunisian phosphates have from 55 to 65% of phosphate of lime, and are very free from iron and alumina, this fitting them especially for superphosphate making. Tennessee phosphate has about 70% of phosphate, Somme and Belgian phosphates 40 to 50%, while Ocean Island and Christmas Island phosphates are of very high grade and yield over 80 and up to 86% of phosphate of lime. Superphosphate is made by finely grinding the raw phosphate and mixing it with oil of vitriol (chamber acid); what actual product is formed is a matter of some uncertainty, but it is a phosphate soluble in water, and believed to be mono-calcic phosphate. This is the true “soluble phosphate,” but in commercial transactions it is universal to express the amount in terms of the original tribasic phosphate which has been rendered soluble. Ordinary grades of mineral superphosphate give from 25 to 27% of soluble phosphate and higher grades 30 to 35%. On reaching the soil, the soluble phosphate becomes precipitated by the calcium and iron compounds in the soil. But it is precipitated in a very fine form of division, in which it is readily attacked by the plant roots. Superphosphate is used practically for all crops, including cereals, clover and other

leguminous crops. Its use tends to early maturity in a crop. Its value for giving a start to root crops is particularly recognized, and root crops generally are dependent on it, as they have little power of utilizing the phosphoric acid in the soil itself. On land poor in lime superphosphate must be used with caution owing to its acid nature, and in such cases an undissolved phosphate is preferable. The quantity in which it is applied ranges from 2 and 3 cwt. per acre to 5 cwt. It suffers but little loss through drainage, and will exercise an influence on crops beyond the year of application.

Basic Slag.—This other principal phosphatic manure is of more recent origin, and is an undissolved phosphate. It is the waste product of steel-making where the Thomas-Gilchrist or "basic" process of manufacture has been employed. This process is used with ores containing much phosphorus, the removal of which is necessary in steel-manufacture. The "converters" which hold the molten iron are lined with lime and magnesia, and the impurities of the iron form a "slag" with these materials. For a long time the slag was regarded as a waste product, but ultimately it was found that, by grinding it very finely, it had distinct agricultural value, and now its use is universal. Basic slag is of various grades, containing 12 to 20% of phosphoric acid, which is believed to exist in the form of a tetracalcic phosphate. This phosphate is found to be readily attacked by a weak solution of citric acid, and this probably accounts for the comparative ease with which plants can utilize the phosphate. With it is also a good deal of lime, and the presence of this undoubtedly, in many cases, accounts partly for the benefits that follow the use of basic slag. It should be very finely ground; a common standard is that 80 to 90% should pass through a sieve having 10,000 meshes to the square inch.

The principal use of basic slag is on grass-land, especially where the soil is heavy or clayey. Its effect on such land in causing white clover to appear is in many cases most remarkable, and without doubt, much poor, cold grass-land has been immensely benefited by its use. It is also employed for root crops; but its effect on these, as on cereals, is not so marked as on grass-land. On light land its benefit is not nearly so great or universal as on heavier land.

III.—Manures containing Nitrogen and Phosphates

These may be classified as follows: (*a*) Natural manures—bones, fish and meat guanos, Peruvian guano, bats' guano; (*b*) Manufactured manures—dissolved bones, compound manures.

a. Natural Manures

Bones..—The value and use of these in agriculture has long been known, as also the comparative slowness of their action, which latter induced Liebig to suggest their treatment with sulphuric acid. Natural bones will contain from 45 to 50% of phosphate of lime with 4 to 4½% of nitrogen. It is usual to boil bones lightly after collection, in order to remove the adhering particles of flesh and the fat. If steamed under pressure the nitrogenous matter is to a great extent extracted, yielding glue, size, gelatine, &c., and the bones—known then in agriculture as "steamed bones"—will contain from 55 to 60% of phosphate of lime with 1 to 1½% of nitrogen. Bones are also imported from India, and these are of a very hard and dry nature. Bones are principally used for root crops, and to some extent on grass-land. The more finely they are ground the quicker is their action, but they are a

slow-acting manure, which remains some years in the land. Mixed with superphosphate, bone meal forms an excellent manure for roots, and obviates the difficulty of using superphosphate on land poor in lime. Steamed bones, sometimes ground into flour, are much used in dairy pastures.

Fish and Meat Guanos.—The term "guano," though generally applied to these manures, is wrongly so used, for they are in no sense guano (meaning thereby the droppings of sea birds). They are really fish or meat refuse, being generally the dried fish-offal or the residue from meat-extract manufacture. They vary much in composition, according to their origin, some being highly nitrogenous (11 to 12% nitrogen) and comparatively low in phosphate of lime, and others being more highly phosphatic (30 to 40% phosphate of lime) with lower nitrogen. These materials are to some extent used for root and vegetable crops, and chiefly for hop-growing, but they go largely also to the artificial manure maker.

Peruvian Guano.—This material, though once a name to conjure with, has now not much more than an academic interest, owing to the rapid exhaustion of the supplies. It is true guano, *i.e.* the deposit of sea birds, and was originally found on islands off the coast of Peru. Peruvian guano was first discovered in 1804 by A. von Humboldt, and the wonderful results attending its use gave an enormous impulse to its exportation. The Chincha Islands yielded the finest qualities of guano, this giving up to 14 and 15% of nitrogen. Gradually the Chincha Islands deposits became worked out, and other sources, such as the Pabellon de Pica, Lobos, Guanape and Huanillos deposits were worked in turn. In many instances the guano had suffered from washing by rain or by decomposition, or in other cases the bare rock was reached and the shipments contained some considerable quantity of this rocky matter, so that the highly nitrogenous guanos were no longer forthcoming and deposits more phosphatic in character took their place. Gradually the shipments fell off, and with them the great reputation of the guano as a manure. On some of the islands the birds, after having been driven off, have returned and fresh deposits are being formed. On the west coast of Africa also some new deposits have been found, and a certain amount of guano comes from Ichaboe Island; but the trade will never be what it once was. Occasional shipments come from the Ballista Islands, giving from 10 to 11% of nitrogen with 11 to 12% of phosphoric acid, and lower-grade guanos (7% of nitrogen and 16% of phosphoric acid) are arriving from Guanape, while from Lobos de Tierra comes a still lower grade.

The particular feature that marked guano was that it contained both its nitrogenous and phosphatic ingredients in forms in which they could be very readily assimilated by plants. Moreover, the occurrence of the nitrogenous and phosphatic matters in different forms of combination gave to them a special value, and one that could not be exactly imitated in artificial manures. The nitrogenous matters, *e.g.*, exist as urates, carbonates, oxalates and phosphates of ammonia, and a particular nitrogenous body termed "guanine" is also found. Guano contains much alkaline salts, and is, from its containing alike phosphates, nitrogen and potash in suitable forms and quantity, an exceedingly well balanced manure. In agriculture it is used for corn crops, and also for root crops, potatoes and hops. It is esteemed for barley, as tending to produce good quality. For vegetable and market-garden crops that require forcing guano is also still in demand. The more phosphatic kinds are sometimes treated with sulphuric acid, and constitute "Dissolved Peruvian Guano."

Bats' Guano.—In caves in New Zealand, parts of America, South Africa and elsewhere, are found deposits formed by bats, and these are used to some extent as a manure, though they have no great commercial value.

b. Manufactured Manures

Dissolved Bones.—These are bones treated with oil of vitriol, as in superphosphate manufacture. By this treatment bones become much more readily available, and are used to a considerable extent, more especially for root crops. Their composition varies with the method of manufacture and the extent to which they are dissolved. Speaking generally, they will have from 11 to 19% of soluble phosphate, with 20 to 24% of insoluble phosphates, and if pure should contain 3% of nitrogen. When mixed with superphosphate in varying amount, or if made with steamed and not raw bone, they are generally known under the indefinite name of "bone manure."

Compound Manures.—To this class belong the manures of every description which it is the aim of the artificial manure manufacturer to compound for particular purposes or to suit particular soils or crops. The base of all these is, as a rule, mineral superphosphate or else dissolved bones, or the two together, and with these are mixed numerous different manurial substances calculated to supply definite amounts of nitrogen, potash, &c. Such manures, the trade in which is a very large one, are variously known as "corn manure," "turnip manure," "grass manure" and the like, and much care is bestowed on their compounding and on their preparation in good condition to allow of their ready distribution over the land.

IV.—Potash Manures

These, with few exceptions, are natural products from the potash mines of Stassfurt (Prussia). Until the discovery of these deposits, in 1861, the use of potash as a fertilizing constituent was very limited, being confined practically to the employment of wood ashes. At the present time a small quantity of potash salts —principally carbonate of potash—is obtained from sugar refinery and other manufacturing processes, but the great bulk of the potash supply comes from the German mines. In these the different natural salts occur in different layers and in conjunction with layers of rock-salt, carbonate of lime and other minerals, from which they have to be separated out and undergo subsequently a partial purification by re-crystallization.

The principal potash salts used in agriculture are—(1) sulphate of potash, which is about 90% pure; (2) kainit, an impure form of sulphate of potash, and containing much common salt and magnesia salts, and giving about 12% of potash (K_2O); (3) muriate of potash, which is used to a great extent in agriculture, and contains 75 to 90% of muriate of potash; and (4) potash manure salts, a mixture of different salts and containing from 20 to 30% of potash.

Potash is much esteemed in agriculture, more especially on light land (which is frequently deficient in it) and on peaty soils, and for use with root crops and potatoes in particular. For fruit and vegetable growing and for flowers potash manures are in constant request. Clay land, as a rule, is not benefited by their use, these soils containing generally an abundance of potash. Along with basic slag, potash salts have been frequently used for grass on light land with advantage.

V.—Miscellaneous Manures

There are, in addition to the foregoing, certain materials which in a limited sense only can be called "manures," but the influences of which are mostly seen in the mechanical and physical improvements which they effect in soil. Such are salt, and also lime in its different forms.

Salt.—The action of salt in liberating potash from the soil has been explained. As a manure it is sometimes used along with nitrate of soda as a top-dressing for corn crops, in the belief that it stiffens the straw. For root crops also, and mangels in particular, it is employed; also for cabbage and other vegetables.

Lime.—The use of this is almost solely to be considered as a soil improvement, and not as that of a manure. Sulphate of lime (gypsum) is, however, occasionally used as a dressing for clover, and also for hops. The fact that superphosphate itself contains a considerable amount of sulphate of lime renders the special application of gypsum unnecessary, as a rule.

As compared with "natural" manures, like farm-yard manure, artificial manures have the disadvantage that they, unlike it, do not improve the physical condition of the soil. Artificial manures have, however, the advantage over farm-yard manure that they can supply in a small compass, and even if used in small quantity, the needed nitrogen, phosphoric acid and potash, &c., which crops require, and which farm-yard manure has but in small proportion. They, further, present the expensive fertilizing matters in a concentrated form, and by their application save expense in labour.

(J. A. V.*)

1 The amount of nitrogen thus deposited annually was found at Rothamsted to be 7.21 lb per acre.

MANUSCRIPT, a term applied to any document written by the human hand (Lat. *manû scriptum*) with the aid of pen, pencil or other instrument which can be used with cursive facility, as distinguished from an inscription engraved with chisel or graver, worked laboriously. By usage the word has come to be employed in a special sense to indicate a written work of the ancient world or of the middle ages; collections of such "ancient manuscripts" being highly prized and being stored for preservation in public libraries. Down to the time of the invention of printing, and until the printed book had driven it out of the field, the manuscript was the vehicle for the conservation and dissemination of literature, and discharged all the functions of the modern book. In the present article a description is given of the development of the ancient manuscript, particularly among the Greeks and Romans, leading on to the medieval manuscripts of Europe, and bringing down the history of the latter to the invention of printing; the history of the printed volume is dealt with in the article Book (*q.v.*).

Materials.—The handbooks on palaeography describe in full the different materials which have been employed from remote time to receive writing, and may be referred to for minuter details. To dispose, in the first place, of the harder materials that have been put under requisition, we find metals both referred to by writers and actually represented by surviving examples. Thin leaves of gold or silver were recommended for the inscription of charms in particular. Leaden plates were in common use for incantations; the material was cheap and was supposed to be durable. On such plates were scratched the *dirae* or solemn devotions of obnoxious persons to the infernal deities; many examples have survived. As an instance of the use of soft substance afterwards hardened may be cited the practice by the Babylonians and Assyrians of writing, or rather of puncturing, their cuneiform characters on clay tablets while moist, which were afterwards dried in the heat of the sun or baked in the oven. Potsherds, or *ostraka*, were employed for all kinds of temporary purposes. Thousands of them have been found in Egypt inscribed with tax receipts and ephemeral drafts and memoranda, children's dictation lessons, &c. Analogous to the clay documents of western Asia are the tablets coated with wax in vogue among the Greeks and Romans, offering a surface not to be inscribed with the pen but to be scratched with the sharp pointed *stilus*. These will be described more fully below. With them we class the wooden boards, generally whitened with a coating of paint or composition and adapted for the pen, which were common in Egypt, and were specially used for educational purposes. Such boards were also employed for official notices in Athens in the 4th century B.C.

Of the more pliant, and therefore generally more convenient, substances there were many, such as animal skins and vegetable growths. Practically we might confine our attention to three of them: papyrus, parchment or vellum, and paper, the employment of which, each in turn, as a writing material became almost universal. But there are also others which must be mentioned.

In a primitive state of society leaves of plants and trees strong enough for the purpose might be taken as a ready-made material to receive writing. Palm leaves are used for this purpose to the present day in parts of India; and the references in classical authors to leaves as early writing material among the Greeks and Romans cannot be dismissed as entirely fanciful.

The bark of trees, and particularly the inner bark of the lime-tree, φιλύρα *tilia*, was employed. The fact that the Latin word *liber*, bark, eventually meant also a book, would be sufficient proof that that material was once in common literary use, even if it were not referred to by writers.

Linen, too, was a writing material among the early Romans, as it was also among the Etruscans, and as it had been to some extent among the Egyptians.

Skins of animals, tanned, have doubtless served as a writing material from the very earliest period of the use of letters. The Egyptians occasionally employed this material. Instances of the use of leather in western Asia are recorded by ancient authors, and from Herodotus we learn that the Ionian Greeks applied to the rolls of the later-imported papyrus the title διφθέραι, skins, by which they had designated their writing material of leather. The Jews, also, to the present day hold to the ancient Eastern custom and inscribe the law upon skin rolls.

But generally these materials were superseded in the old world by the famous Egyptian writing material manufactured from the papyrus plant, which gradually passed beyond the boundaries of its native land and was imported at a remote period into other countries. Into Greece and into Rome it was introduced at so early a time that practically it was the vehicle for classical literature throughout its course. A description of the manufacture and use of this material will be found under PAPYRUS. Here it need only be noted that papyrus is associated in Greek and Roman literature with the roll form of the ancient manuscript, as will be more fully explained below, and that it was the supersession of this material by parchment or vellum which led to the change of shape to the book form.

The introduction of the new material, parchment or vellum, was not a revival of the use of animal skins as followed by the old world. The skins were now not tanned into leather, but were prepared by a new process to provide a material, thin, strong, flexible, and smooth of surface on both faces. This improved process was the secret of the success of the new material in ousting the time-honoured papyrus from its high position. The common story, as told by Pliny, that Eumenes II. of Pergamum (197-158 B.C.), seeking to extend the library of his capital, was opposed by the jealousy of the Ptolemies, who forbade the export of papyrus, hoping thus to check the growth of a rival library, and that he was thus compelled to have recourse to skins as a writing material, at all events points to Pergamum as the chief centre of trade in the material, περγαμηνή *charta pergamena*. The old terms διφθέραι, *membranae*, applied originally to the older leather, were transferred to the newly improved substance. In describing MSS. written on, this material, by common consent the term parchment has in modern times given place to that of vellum, properly applicable only to calfskin, but now generally used in reference to a medieval skin-book of any kind. Parchment is a title now usually reserved for the hard sheepskin or other skin material on which law deeds are engrossed. (See PARCHMENT.)

Vellum had a long career as a writing material for the literature of the early centuries of our era and of the middle ages. But in its turn it eventually gave place to paper (*q.v.*). As early as the 13th century paper, an Asiatic invention, was making its way into Europe and was adopted in the Eastern Empire as a material for Greek literature side by side with vellum. It soon afterwards began to appear in the countries of southern Europe. In the course of the 14th century the use of it became fairly established, and in the middle of the century a number of paper manuscripts were produced along with those on vellum, particularly in Italy. Finally, in the 15th century paper became the common material for the manuscript book. The new paper, however, made no further change in the form of the manuscript. It possessed exactly the same qualities, as a writing material, as vellum: it could be inscribed on both sides; it could be made up into quires and bound in the codex form; and it had the further advantage of being easily manufactured in large quantities, and therefore of being comparatively cheap.

The Forms of the Manuscript Book.—In describing the development of the manuscript book in the ancient world, and subsequently in the middle ages, we have to deal with it in two forms. The common form of the book of the ancient world was the *roll*, composed of one continuous sheet of material and inscribed only on one side. This form had a long career. In Egyptian literature it can be traced back for thousands of years. In Greek literature it may he assumed to have been in vogue from the earliest times;

actual examples have survived of the latter part of the 4th and beginning of the 3rd centuries B.C. As to its early use in Latin literature we cannot speak so definitely; but Rome followed the example of Greece in letters, and therefore no doubt also in the material shape of literary productions. Both in Greek and Latin literature the roll lasted down to the early centuries of the Christian era. It was superseded by the *codex*, the manuscript in book form (in the modern sense of the word book), composed of separate leaves stitched together into quires and made available to receive writing on both sides of the material. This form is still in vogue as the modern printed book, and probably will never be superseded. But the codex in this developed shape was only an evolution from the early waxen tablets of the Greeks and Romans, two or more of which, hinged together, formed the primitive codex which suggested the later form. Therefore it will be necessary to include the description of the tablets with that of the later codex.

The Roll.

The ordinary terms in use among the Greeks for a book (that is, a roll) were βύβλος (another form of βύβλος, papyrus) and its diminutive βιβλίον, which included the idea of a written book. The corresponding Latin terms were *liber* and *libellus*; *volumen* was a rolled-up roll. A roll of material uninscribed was χάρτης, *charta*, or τόμος (originally a *cutting* of papyrus), applicable also to a roll containing a portion or division of a large work which extended to more than one roll. A work contained within the compass of a single roll was a μονόβιβλος, or μονόβιβλον. The term τεῦχος seems also to have meant a single roll, but it was also applied at a later time to indicate a work contained in several rolls.

In writing the text of a work, the scribe might choose to make use of separate sheets of papyrus, κολλήματα, *schedae*, and then join them to one another consecutively so as to make up the roll; or he might purchase from the stationers a *scapus*, or ready-made roll of twenty sheets at most; and if this length were not sufficient, he might add other sheets or *scapi*, and thus make a roll of indefinite length. But proverbially a great book was a great evil, and, considering the inconvenience of unrolling a long roll, not only for perusal, but, still more so, for occasional reference, the practice of subdividing lengthy works into divisions of convenient size, adapted to the capacity of moderate-sized rolls, must have come into vogue at a very early period.

It was the practice to write on one side only of the papyrus; to write on both front and back of a roll would obviously be a clumsy and irritating method. Works intended for the market were never *opisthograph*. Of course the blank backs of written rolls which had become obsolete might be turned to account for personal or temporary purposes, as we learn not only from references in classical authors but also from actual examples. The most interesting extant case of an opisthograph papyrus is the copy of Aristotle's *Constitution of Athens* in the British Museum, which is written on the back of a farmer's accounts, of the end of the 1st century—but only for private use. It being the rule, then, to confine the writing to one side of the material, that is, to the inner surface of the made-up roll, that surface was more carefully prepared and smoothed than the other; and, further, the joints of the several sheets were so well made that they offered no obstacle to the action of the pen. Still further, care was taken that this, the *recto* surface of the material, should be that in which the shreds of papyrus of which it was composed lay horizontally, so that the pen might move freely along the fibres; the shreds of the *verso* side, on the other hand, being in vertical position. This point is of some importance, as, in cases where two different handwritings are found on the two sides of a papyrus, it may be usually assumed that the one on the *recto* surface is the earlier.

The text was written in columns, σελίδες, *paginae*, the width of which seems not to have been prescribed, but which for calligraphic effect were by preference made narrow, sufficient margins being left at head and foot. The average width of the columns in the best extant papyri ranges from two to three-and-a-half inches. The written lines were parallel with the length of the roll, so that the columns stood, so to say, with the height of the rolled-up roll, and were disclosed consecutively as the roll was unwound. Ruling with lead to guide the writing is mentioned by writers, but it does not appear that the practice was generally followed. The number of lines in the several columns of extant papyri is not constant, nor is the marginal boundary of the beginnings of the lines, for the accuracy of which a ruled vertical line would have proved useful, ordinarily kept even. No doubt in practice the horizontal fibres of the material were found to afford a sufficient guide for the lines of writing.

If the title of the work was to be given, the scribe appears to have written it ordinarily at the end of the text. But something more was needed. To be obliged to unroll a text to the end, in order to ascertain the name of the author, would be the height of inconvenience. Its title was therefore sometimes written at the head of the text. It appears also that at an early period it was inscribed on the outside of the roll, so as to be visible as the roll lay in a chest or on the shelf. But a more general practice was to attach to the top edge of the roll a label or ticket, σίλλυβος, or σίττυβος, *titulus*, *index*, which hung down if the roll lay on the shelf, or was conveniently read if the roll stood along with others in the ordinary cylindrical roll-box, κίστη, κιβωτός, *cista*, *capsa*. One such label made of papyrus has survived and is in the British Museum.

The scribe would not commence his text at the very beginning, nor would he carry it quite down to the end, of the roll. He would leave blank a sufficient length of material at either extremity, where the roll would naturally be most exposed to wear and tear by handling in unrolling and re-rolling; and, further, the extreme vertical edges might each be strengthened by the addition of a strip of papyrus so as to form a double thickness of material.

According to the particulars given by classical authors, the roll would be finished off somewhat elaborately; but the details described by them must be taken to apply to the more expensive productions of the book trade, corresponding with the full-bound volumes of our days. In practice, a large proportion of working copies and ordinary editions must have been dealt with more simply. Firstly, the roll should be rolled up round a central stick, of wood or bone, called the ὀμφαλός, *umbilicus*, to which the last sheet of the papyrus may or may not have been attached. But as a matter of fact no rolling-sticks have been found in company with extant papyri, and it has therefore been suggested that they were not attached to the material but were rolled in loose, and were therefore liable to drop out. In some instances, as in the rolls found at Herculaneum, a central core of papyrus instead of a stick was thought sufficient. The edges, *frontes*, of the roll, after it had been rolled up, were shorn and were rubbed smooth with pumice, and they were sometimes coloured. A valuable roll might be protected with a vellum wrapper, φαινόλης, *paenula*, stained with colour; and, further, it might be secured with ornamental thongs. The central stick might also be adorned with knobs or "horns," plain or coloured. This seems to be the natural explanation of the κέρατα, or *cornua*, mentioned by the ancient writers. Finally, the title-label described above was attached to the completed roll, now ready for the book-market.

In the perusal of a work the reader held the roll upright and unrolled it gradually with the right hand; with the left hand he rolled up in the reverse direction what he had read. Thus, when he had finished, the roll had become reversed, the beginning of the text being now in the centre of the roll and the end of it

being outside. The roll was "explicitus ad umbilicum," or "ad sua cornua." It had therefore now to be unrolled afresh and to be re-rolled into its normal shape—a troublesome process which the lazy man shirked, and which the careful man accomplished by making the revolutions with his two hands while he held the revolving material steady under his chin.

Although the codex or manuscript in book-form began to make its way in Greek and Roman literature as early as the 1st century of our era, the roll maintained its position as the recognized type of literary document down to the 3rd, and even into the 4th, century, when it was altogether superseded. We shall proceed to describe the codex after giving some account of the waxen, or, to speak more correctly, the waxed, tablet, its precursor in the book-form.

The Waxen Tablet.

The ordinary waxen tablet in use among the Greeks and Romans was a small oblong slab of wood, beech, fir, and especially box, the surface of which on one or both sides, with the exception of the surrounding margins which were left intact in order to form a frame, was sunk to a slight depth and was therein coated with a thin layer of wax, usually black. The tablet thus presented the appearance of a child's school-slate of the present day. Such tablets were single, double, triple, or of several pieces or leaves. In Greek they were called πίναξ, πινακίς, δέλτος, δελτίον.: in Latin *cera*, *tabula*, *tabella*, &c. Two or more put together and held together by rings or thongs acting as hinges formed a *caudex* or *codex*, literally a stock of wood, which a set of tablets might resemble, and from which they might actually be made by cleaving the wood. A codex of two leaves was called δίθυροι, δίπτυχα, *diptycha*; of three, τρίπτυχα, *triptycha*: and so on. The triptych appears to have been most generally used. A general term was also *libellus*.

Tablets served for the ordinary minor affairs of life: for memoranda, literary and other notes and drafts, school exercises, accounts, &c. The writing incised with the stilus could be easily obliterated by smoothing the wax, and the *tabula rasa* was thus rendered available for a fresh inscription. But tablets were also employed for official purposes, when documents had to be protected from unauthorized scrutiny or from injury. Thus they were the receptacles for wills, conveyances, and other legal transactions; and in such cases they were closed against inspection by being bound round with threads which were covered by the witnesses' seals.

Small tablets, *codicilli*, *pugillares*, often of more valuable material, such as ivory, served for correspondence among other purposes; very small specimens are mentioned as *vitelliani*, for the exchange of love-letters.

A certain number of Greek waxen tablets have been recovered, chiefly from Egypt, but none of them is very early. They are generally of the 3rd century, and are mostly inscribed with school exercises. The largest and most perfect extant codex is one in the British Museum (Add. MS. 33,270), perhaps of the 3rd century, being made up of nine leaves, measuring nearly 9 by 7 in., and inscribed with documents in shorthand.

Of Latin tablets we are fortunate in having a fairly large number of examples. Exclusive of a few isolated specimens, they are the result of two important finds. Twenty-four tablets containing the records of a burial club, A.D. 131-167, were recovered between 1786 and 1855 from some ancient mining works in Dacia. In 1875 as many as 127 tablets, containing deeds connected with sales by auction and payment of

taxes, A.D. 15-62, were found in the ruins of Pompeii. These specimens have afforded the means of ascertaining the mechanical arrangement of waxen tablets when adopted for legal instruments among the Romans. Most of them are triptychs, severally cloven from single blocks of wood. Subject to some variations, the triptych was usually arranged as follows. Of the six sides or pages of the codex, pages 1 and 6 (the outside pages) were of plain wood; pages 2, 3, 5 were waxed; and page 4, which had a groove cut across the middle was sometimes of plain wood, sometimes waxed. The authentic deed was inscribed with the stilus on the waxed pages 2 and 3; and the first two leaves were then bound round with three twisted threads which passed down the groove so as to close the deed from inspection. On page 4 the witnesses' names were then inscribed (in ink if the page was plain; with the stilus if waxed), and their seals were impressed in the groove, thus securing the threads. In addition to the protection afforded to the seals from casual injury by their position in the groove, the third leaf acted as a cover to them. On page 5 an abstract or duplicate of the deed, as required by law, was inscribed. The arrangement of the Dacian tablets differed in this respect, that page 4 was waxed, and that the duplicate copy was begun on that page in the space on the left of the groove, that on the right being reserved for the names of the witnesses. In the case of one of the Pompeian tablets the threads and seals still remain.

The survival of the use of tablets to a late time should be noted. St Augustine refers to his tablets, and St Hilary of Arles also mentions their employment for the purpose of correspondence; there is a record of a letter written *in tabellâ* as late as A.D. 1148. They were very commonly used throughout the middle ages in all the west of Europe. Specimens inscribed with money accounts of the 13th and 14th centuries have survived in France, and similar documents of the 14th and 15th centuries are to be found in several of the municipal archives of Germany. Reference to their use in England occurs in literature, and specimens of the 14th or 15th century are said to have been dug up in Ireland. In Italy their employment is both recorded and proved by actual examples of the 13th and 14th centuries. With the beginning of the 16th century they seem to have practically come to an end, although a few survivals of the custom of writing on wax have lingered to modern times.

The Codex.

As already stated, the *codex*, or MS. in book-form, owed its existence to the substitution of vellum for papyrus as the common writing material for Greek and Roman literature. The fact that vellum was a tough material capable of being inscribed on both sides, that writing, particularly if freshly written, could be easily washed off or erased from it, and that the material could thus be made available for second use, no doubt contributed largely to its ready adoption. In Rome in the 1st century B.C. it was used, like the waxen tablets for notes, drafts, memoranda, &c.; and vellum tablets began to take the place of the *cerae*. References are not wanting in the classical writers to its employment for such temporary purposes. To what extent it was at first pressed into the service of literature and used in the preparation of books for the market must remain uncertain. But in the first three centuries of our era it may be assumed that vellum codices were not numerous. The papyrus roll still held its position as the *liber* or book of literature. Yet we learn from the poems of Martial that in his day the works of some of the best classical authors were to be had on vellum. From the way in which, in his *Apophoreta*, he has contrasted as exchangeable gifts certain works written respectively on papyrus and on vellum, it has been argued that vellum at that time was a cheap material, inferior to papyrus, and only used for roughly written copies. Up to a certain point this may be true, but the fact that the earliest great vellum Greek codices of the Bible and of Latin classical authors, dating back to the 4th century, are composed of very finely prepared material would indicate a perfection of manufacture of long standing.

But, apart from the references of writers, we have the results of recent excavations in Egypt to enable us to form a more correct judgment on the early history of the vellum codex. There have been found a certain number of inscribed leaves and fragments of vellum of early date which without doubt originally formed part of codices or MSS. in book-form. It is true that they are not numerous, but from the character of the writing certain of them can be individually assigned to the 3rd, to the 2nd, and even to the 1st century. We may then take it for an established fact that the codex form of MS. was gradually thrusting its way into use in the first centuries of our era.

The convenience of the codex form for easy reference was also a special recommendation in its favour. There can be little doubt that such compilations as public registers must at once have been drawn up in the new form. The jurists also were quick to adopt it, and the very title "codex" has been attached to great legal compilations, such as those of Theodosius and Justinian. Again, the book-form was favoured by the early Christians. The Bible, the book which before all others became the great work of reference in their hands, could only be consulted with convenience and despatch in the new form. A single codex could hold the contents of a work which formerly must have been distributed through many volumes in roll-form. The term σωμάτιον, which was one of the names given to a codex, was expressive of its capacity. Turning again to discoveries in Egypt, it appears that in the early centuries the codex-form had become so usual among the Christians in that land that even the native material, papyrus, the recognized material for the roll, was now also made up by them into leaved books. The greater number of papyri of the 3rd century containing Christian writings, fragments of the Scriptures, the "Sayings of Our Lord," and the like, are in book-form. On the other hand, the large majority of the non-Christian papyri of the same period keep to the old roll-form. Thus the codex becomes at once identified with the new religion, while the papyrus roll to the last is the chosen vehicle of pagan literature.

In the 4th century the struggle between the roll and the codex for supremacy in the literary field was finished, and the victory of the codex was achieved. Henceforward the roll-form remained in use for records and legal documents, and in certain instances for liturgies; and for such purposes it survives to the present day. But so completely was it superseded in literature by the codex that even when papyrus, the material once identified with the roll-form, was used as it sometimes was down to the 6th and 7th centuries and later, it was made up into the leaved codex, not only in Egypt but also in western Europe.

The shape which the codex usually assumed in the early centuries of the middle ages was the broad quarto. The quires or gatherings of which the book was formed generally consisted, in the earliest examples, of four sheets folded to make eight leaves (τετρᾶς or τετράδιον, *quaternio*), although occasionally quinterns, or quires of five sheets (ten leaves), were adopted. Sexterns, or quires of six sheets (twelve leaves), came into use at a later period. In making up the quires, care was generally taken to lay the sheets of vellum in such a way that hair-side faced hair-side, and flesh-side faced flesh-side; so that, when the book was opened, the two pages before the reader had the same appearance, either the yellow tinge of the hair-side, or the fresh whiteness of the flesh-side. In Greek MSS. the arrangement of the sheets was afterwards reduced to a system; the first sheet was laid with the flesh-side downwards, so that that side began the quire; yet in so early an example as the Codex Alexandrinus the first page of a quire is the hair-side. In Latin MSS. also the hair-side appears generally to have formed the first page. When paper came into general use for codices in the 15th century, it was not an uncommon practice to give the paper quires additional strength by an admixture of vellum, a

Quires.

sheet of the latter material forming the outer leaves, and sometimes the middle leaves also, of the quire. The quire mark, or "signature," was usually written at the foot of the last page, but in some early instances (*e.g.* the Codex Alexandrinus) it appears at the head of the first page of each quire. The numbering of the separate leaves in a quire, in the fashion followed by early printers, came in in the 14th century. Catch-words to connect the quires appear first in the 11th century and are not uncommon in the 12th century.

Ruling.

No exact system was followed in ruling the guiding lines on the pages of the codex. In the case of papyri it was enough to mark with the pencil the vertical marginal lines to bound the text, if indeed even this was considered needful (see above); the fibres of the papyrus were a sufficient guide for the lines of writing. On vellum it became necessary to rule lines to keep the writing even. These lines were at first drawn with a blunt point, almost invariably on the hair (or outer) side of the skin, and strongly enough to be in relief on the flesh (or inner) side. Marginal lines were drawn to bound the text laterally; but the ruled lines which guided the writing were not infrequently drawn right across the sheet. Each sheet should be ruled separately; but two or more sheets were often laid and ruled together, the lines being drawn with so much force that the lower sheets also received the impressions. In rare instances lines are found ruled on both sides of the leaf, as in some parts of the Codex Alexandrinus. In this same MS. and in other early codices the ruling was not always drawn for every line of writing, but was occasionally spaced so that the writing ran between the ruled lines as well as on them. The lines were evenly spaced by means of guiding pricks made at measured intervals with a compass or rotary instrument down the margins; in some early MSS. these pricks run down the middle of the page. Ruling with the plummet or lead-point is found in the 11th century and came into ordinary use in the 12th century; coloured inks, *e.g.* red and violet, were used for ornamental ruling in the 15th century.

Columns.

Mechanical Arrangement of Writing in MSS.—It has already been stated above that in the papyrus rolls the text was written in columns. They stood with convenient intervals between them and with fair margins at top and bottom. The length of the lines was to some extent governed by the nature of the text. If it was a poetical work, the metrical line was naturally the line of the column, unless, as sometimes was the case, the verse was written continuously as prose. For prose works a narrow column was preferred. It is noticeable that the columns in papyri have a tendency to lean to the right instead of being perpendicular—an indication that it was not the practice to rule marginal lines. In codices the columnar arrangement was also largely followed, and the number of columns in a page was commonly two. There are instances, however, of a larger number. The Codex Sinaiticus of the Bible has four columns to the page; and the Codex Vaticanus, three columns. And the tricolumnar arrangement occurs every now and then in later MSS.

Text without separation of Words.

In both Greek and Latin literary MSS. of early date the writing runs on continuously without separation of words. This practice however, may be regarded as rather artificial, as in papyri written in non-literary hands and in Latin deeds also, contemporary with these early literary MSS., there is a tendency to separation. In a text thus continuously written occasional ambiguities necessarily occurred, and then a dot or apostrophe might be inserted between words to aid the reader. Following the system of separation of words which appears in ancient inscriptions, wherein the several words are marked off by single, double, or treble dots or points, the words of the fragmentary poem on the battle of Actium found at Herculaneum are separated by single points, probably to facilitate reading aloud; monosyllables or short prepositions and

conjunctions, however, being left unseparated from the words immediately following them—a system which is found in practice at a later time. But such marks of separation are not to be confounded with similar marks of punctuation whereby sentences are marked off and the sense of the text is made clear. Throughout the career of the uncial codices down to the 6th century, continuity of text was maintained. In the 7th century there is some evidence of separation of words, but without system. In early Latin minuscule codices partial separation in an uncertain and hesitating manner went on to the time of the Carolingian reform. In early Irish and English MSS., however, separation is more consistently practised. In the 9th and 10th centuries long words tend to separation, but short words, prepositions and conjunctions, still cling to the following word. It was not till the 11th century that the smaller words at length stood apart, and systematic separation of words was established. In Greek minuscule codices of the 10th century a certain degree of separation takes place; yet a large proportion of words remain linked together, and they are even incorrectly divided. Indeed a correct system of distinct separation of words in Greek texts was never thoroughly established even as late as the 15th century.

Paragraphs.

But while distinction of words was disregarded in early literary texts, distinction of important pauses in the sense was recognized from the first. The papyrus of the *Persae* of Timotheus of Miletus, the oldest MS. of a Greek classic in existence, of the end of the 4th century B.C., is written in independent paragraphs. This is a natural system, the simplicity of which has caused it to be the system of modern times. But, in addition, the Greek scribe also separated paragraphs by inserting a short horizontal stroke, παράγραφος, between them at the commencement of the lines of writing. It should be noted that this stroke indicated the close of a passage, and therefore belonged to the paragraph just concluded, and did not stand for an initial sign for the new paragraph which followed. The dividing stroke was also used to mark off the different speeches of a play. Besides the stroke, a wedge-shaped sign or tick might be used. But to make every paragraph stand distinctly by itself would have entailed a certain loss of space. If the concluding line were short, there would remain a long space unfilled. Therefore, when this occurred, it became customary to leave only a short space blank to mark the termination of the paragraph, and then to proceed with the new paragraph in the same line, the παράγραφος at the same time preventing possible ambiguity. The next step was to project the first letter of the first full line of the new paragraph slightly into the margin, as a still further distinction; and lastly to enlarge it. The enlargement of the letter gave it so much prominence that the dividing stroke could then be dispensed with, and in this form the new paragraph was henceforward indicated in Greek MSS., it being immaterial whether the enlarged letter was the initial or a medial letter of a word. As early as the 5th century there is evidence that the παράγραφος was losing its meaning with the scribes, for in the Codex Alexandrinus of the Bible it is not infrequently found in anomalous positions, particularly above the initial letters of different books, as if it were a mere ornament.

In Latin MSS. there was no such fixed system of marking off paragraphs as that just described. A new paragraph began with a new line, or a brief space in a line separated the conclusion of a paragraph from the beginning of the next one. It was only by the ultimate introduction of large letters, as the initial letters of the several sentences and paragraphs, and by the establishment of a system of punctuation, in the modern sense of the word, that a complete arrangement of the text was possible into sentences and paragraphs in accordance with its sense.

From the earliest times an elementary system of punctuation by points is found in papyri. Thus the papyrus of the *Curse of Artemisia*, at Vienna, which is at least as early as the 3rd century B.C., and in one or two other ancient examples, a double point, resembling the modern colon, separates sentences. But more commonly a single point, placed high in the line of writing, is employed. This single punctuation was reduced to a system by the Alexandrian grammarians, its invention being ascribed to Aristophanes of Byzantium, 260 B.C. The point placed high on a level with the top of the letters had the value of a full-stop; in the middle of the line of writing, of a comma; and low down on the line, of a semicolon. But these distinctions were not observed in the MSS. In the early vellum codices both the high and the middle point are found. In medieval MSS. other signs, coming nearer to our modern system, make their appearance. In Latin MSS. by the 7th century the high point has the value of the modern comma, the semicolon appears with its present value, and a point emphasized with additional signs, such as a second point or point and dash, marks a full-stop. In the Carolingian period the comma appears, as well as the inverted semicolon holding a position between our comma and semicolon.

Punctuation.

Another detail which required the scribe's attention in writing his text was the division of the last word in a line, when for want of room a portion of it had to be carried over into the next line. It was preferable, indeed, to avoid such division, and in the papyri as well as in the codices letters might be reduced in size and huddled together at the end of the line with this view. In the early codices too it was a common practice to link letters together in monogrammatic form, such as the common verbal terminations *ur*, *unt*, and thus save space. But when the division of a word was necessary, it was subject to certain rules. According to the Greek practice the division was ordinarily made after a vowel, as ἔτυ|χον (even monosyllables might be so treated, as οὐ|κ). But in the case of double consonants the division fell after the first of them, as ἵπ|πος: and, when the first of two or more consonants was a liquid or nasal the division followed it, as ὀφθαλ|μός, μαν|θάνω. When a word was compounded with a preposition, the division usually followed the preposition, as προς|εῖπον, but not infrequently the normal practice of dividing after a vowel prevailed, as προ|σεῖπον. In Latin the true syllabic division was followed, but occasionally the scribes adopted the Greek system and divided after a vowel.

Division of Words at the End of a Line.

A modification of the practice of writing the text continuously was allowed in the case of certain works. Rhetorical texts, such as the orations of Demosthenes and Cicero, and the text of the Bible, might be broken up into short clauses or sense-lines, apparently with the view of assisting reading aloud. Instances of MSS. so written are still extant. This system, to which the name of "colometry" has been given, is the arrangement by *cola* and *commata* referred to by St Jerome in his preface to Isaiah. It will be found more fully explained under the heading of STICHOMETRY; where also is described the mechanical computation of the length of a text by measured lines, for the purpose of calculating the pay of the scribe.

Colometry.

The title of a MS., both in roll-form and in codex-form, was frequently written at the end of the text, but even at an early date it stood in some instances at the beginning; and the latter practice in course of time prevailed, although even in the 15th century the title was sometimes reserved for the close of the MS. In this latter position it might stand alone or be accompanied by other particulars concerning the MS., such as the length of the work, the date of writing, the

Titles and Colophons.

name of the scribe, &c., all combined in a final paragraph called the colophon. For distinction, title and colophon might be written in red, as might also the first few lines of the text. This method of rubrication was a very early practice, appearing even in ancient Egyptian papyri. Such rubrics and titles and colophons were at first written in the same character as the text; afterwards, when the admixture of different kinds of writing was allowed, capitals and uncials were used at discretion. Running titles or head-lines are found in some of the earliest Latin MSS. in the same characters as the text, but of a small size. Quotations were usually indicated by ticks or arrow-heads in the margin, serving the purpose of the modern inverted commas. Sometimes the quoted words were arranged as a sub-paragraph or indented passage. In commentaries of later date, the quotations from the work commented upon were often written in a different style from the text of the commentary itself.

Quotations.

Accentuation, &c.—Accentuation was not systematically applied to Greek MSS. before the 7th century, but even in the literary papyri it appears occasionally. In the latter instances accents were applied specially to assist the reader, and they seem to have been used more frequently in texts which may have presented greater difficulties than usual. For example, they are found fairly plentifully in the papyrus of Bacchylides of the 1st century B.C. In the less well-written papyri they are fewer in number; and papyri written in non-literary hands are practically devoid of them. Accents have been frequently added to the ancient texts of Homer, as in the Harris and Bankes papyri, but apparently long after the date of the writing. They were not used in the early uncial MSS. Breathings also appear occasionally in the papyri. The rough and the smooth breathings are found in the form of the two halves of the H ( ) in the Bacchylides papyrus; in other papyri they are in rectangular form, never rounded like an apostrophe; in fact rounded breathings do not come into general use until the 12th century. Other signs resembling accents are used occasionally in Greek MSS. For example, a short accent or horizontal stroke was employed to indicate a single-letter word, and an apostrophe was sometimes used to separate words in order to prevent ambiguity and was placed after words ending in κ, χ, ξ, ρ, and after proper names not having a Greek termination.

Accents were seldom employed by Latin scribes. In early Irish and English MSS., in particular, an acute accent is occasionally found over a monosyllabic word or one consisting of a single letter. In the 9th and 10th centuries a curious occasional practice obtained among the correctors of the texts of expressing the aspirate by the Greek half-eta symbol , instead of writing the letter *h* in the ordinary way—perhaps only an affectation.

Corrections.—For obliteration or removing pen strokes from the surface of the material the sponge was used in ancient times. While the writing was still fresh, the scribe could easily wash off the ink by this means; and for a fragile material, such as papyrus, he could well use no other. On vellum he might use sponge or knife. But after a MS. had left his hands it would undergo revision at the hands of a corrector, who had to deal with the text in a different manner. He could no longer conveniently apply the sponge. On hard material he might still use the knife to erase letters or words or sentences. But he could also use his pen for such purposes. Thus we find that a very early system of indicating erasure was the placing of dots or minute strokes above the letters to be thus "expunged." The same marks were also (and generally at later periods) placed under the letters; in rare instances they stood inside them. It need scarcely be said that letters were also struck out with strokes of the pen or altered into others, and that letters and words were interlined. A long sentence, however, which could not be admitted between the lines, was entered in the margin, and its place in the text indicated by corresponding reference marks, such as *hd.*, *hs.* = *hic deest*, *hoc supra* or *hic scribas*, &c.

Abbreviations and Contractions.—The practice of shortening words in writing has played an important part in the history of the ancient and the medieval manuscript. Two reasons have disposed men to follow this practice: firstly, the desire to avoid the labour of writing over and over again words or portions of words of common occurrence which can be readily understood in a shortened form as when written in full; and, secondly, the necessity of saving space at a time when it was an object to make the most of the writing material to hand. To meet the former requirement, a simple and limited method alone was needed; to satisfy the second, a more elaborate system was necessary. The most natural method of reducing the length of a word is to suppress as much

as possible of its termination, consistently with intelligibility, that is, by simple *abbreviation*. But if space of any appreciable value is to be saved in a page of writing, a system is necessary for eliminating letters from the body of the word as well as curtailing the termination, that is, a system of *contraction* as well as abbreviation; and, in addition, the employment of arbitrary signs, analogous to shorthand, will serve still further to condense the text. An elaborate system of contraction of this nature was naturally only fully developed after very long practice. Both in Greek and in Latin MSS. from the 9th to the 15th century such a system was in full force.

Different kinds of literature were, according to their nature, more or less abbreviated and contracted. From early times such curtailment was more freely employed in works written in technical language, such as works on law or grammar or mathematics, wherein particular words are more liable to repetition, than in MSS. of general literature. The oldest system of abbreviation is that in which a single letter (nearly always the initial letter) or at most two or three letters represent the whole word. This system we know was in common use among both Greek and Latin writers, and ancient inscriptions afford plentiful examples. It is well adapted for the brief expression of the common words and phrases in works of a technical nature (as for example such a phrase as C D E R N E = *cujus de ea re notio est*); but for general literature it is of little use, and practically has been restricted to express proper names and numerals.

When abbreviations were employed only with the view of speed in writing, it is obvious that they would occur more frequently in the ephemeral documents of daily life than in carefully written literary works intended for the book-market. Hence they are not to be found in Greek papyri of the latter class. On the other hand in literary papyri

Abbreviation in Greek MSS.

written in non-literary script they naturally occur just as they would in contemporary common documents. As early as the 3rd and 2nd centuries B.C. the ordinary method of abbreviation was to omit the termination or latter portion of the word and to mark the omission by a short horizontal stroke or dash; or the letter which immediately preceded the omission was written above the line as a key to the reading, as τελ for τέλος. Such a system obviously might be extended indefinitely at the discretion of the writer. But in addition, at quite an early period, symbols and monogrammatic forms for particular words must have been developed, for they are found in common use in cursive papyri. A notable instance of their employment in a full degree occurs in the papyrus of Aristotle's *Constitution of Athens*, of the 1st century.

Like the well-written literary papyri, the early vellum uncial codices of the Bible, being inscribed with calligraphic formality, avoided in principle the use of abbreviations. But by the 4th to the 6th century, the period when they were chiefly produced, the contraction or abbreviation of certain words and terminations had, it seems, become so fixed by usage that the contracted forms were adopted in the texts. They are ΘC = θεός, IC = ίησοῦς, XC = χριστός, ΠNA = πνεῦμα, CHP = σωτήρ, KC = κύριος, CTPOC = σταυρός, ΠHP = πατήρ, MHP = μήτηρ, ϒC = υίός, ANOC = ἄνθρωπος, OϒNOC = οὐρανός, K = καί, T = ται, M = μου, μοι, &c. Final N, especially at the end of a line, was dropped, and its place occupied by the horizontal stroke, as TO‾.

But while this limited system was used in biblical, and also in liturgical MSS., in profane literature a greater licence was recognized. For example, in a fragment of a mathematical work at Milan, of the 7th

century, we find instances of abbreviation by dropping terminations, just as in the earlier papyri, and, in addition, contracted particles and prepositions are numerous. Technical works, in fact, inherited the system instituted in the early papyri written in non-literary or cursive hands; and this system, undergoing continual development, had a larger scope when the cursive writing was cast into a literary form and became the literary minuscule script of the middle ages. From the 9th century onwards a fully developed system of abbreviation and contraction was practised in Greek MSS., comprising the early system of the papyri, the special contractions of the early biblical MSS., and also a large number of special symbols, derived in great measure from tachygraphical signs.

In the early Greek minuscule MSS. contractions are not very frequent in the texts; but in the marginal glosses, where it was an object to save space, they are found in great numbers as early as the 10th century. The MS. of Nonnus, of A.D. 972, in the British Museum (Wattenb. and Von Vels., *Exempla*, 7) is an instance of a text contracted to a degree that almost amounts to tachygraphy. In the 12th, 13th and 14th centuries texts were fully contracted; and as the writing became more cursive contraction-marks were more carelessly applied, until, in the 15th century, they degenerated into mere flourishes.

Abbreviations in Latin MSS.

As far back as material is available for comparison, it appears that abbreviations and contractions in Latin MSS. followed the same lines as those in Greek MSS. We have no very early papyri written in Latin as we have in Greek to show us what the practice of Roman writers was in the 3rd and 2nd and early 1st centuries B.C.; but there can be little doubt that in that remote time there was followed in Latin writing a system of abbreviation similar to that in Greek, that is, by curtailment

of terminations, and that in ephemeral documents written in cursive characters such abbreviation was allowed more freely than in carefully written literary works. The early system of representing words by their initial letters has already been referred to. It was in common use, as we know, in the inscriptions on coins and monuments, and to some extent in the texts of Roman writers. But the ambiguity which must have always accompanied such a system of single-letter abbreviations, or *sigla*, naturally induced an improvement by expressing a word by two or more of its letters. Hence was developed the more regular syllabic system of the Romans, by which the leading letters of the several syllables were written, as EG = *ergo*, HR̄ = *heres*, ST̄ = *satis*. At a later time Christian writers secured greater exactness by expressing the final letter of a contracted word, as *dz̄* = *deus*, *dō* = *deo*, *scs* = *sanctus*. Further, certain marks and signs, many derived from shorthand symbols, came into use to indicate inflections and terminations; or the terminating letter or a leading letter to indicate the termination might be written above the line, as Qo = *quo*, Vm = *verum*, No = *noster*, Si = *sint*. This practice became capable of greater development later on. Among the special signs are c̄ = *est*, t̄ = *vel*, *n̄* = *non*, p’ = *pre*, p̄ = *per*, ꝑ = *pro*, 9 = termination *us*. The letter *q* with distinctive strokes applied in different positions represented the often recurring relative and other short words, as *quod*, *quia*.

In Latin Biblical uncial MSS. the same restrictions on abbreviations were exercised as in the Greek. The sacred names and titles D̄S̄ = *deus*, D̄M̄S̄, DN̄S̄ = *dominus*, SC̄S̄ = *sanctus*, S̄P̄S̄ = *spiritus*, and others appear in the oldest codices. The contracted terminations Q· = *que*, B· = *bus*, and the omission of final *m*, or (more rarely) final *n*, are common to all Latin MSS. of the earliest period. There is a peculiarity about the contracted form of our Saviour’s name that it is always

written by the Latin scribes in letters imitating the Greek IHC, XPC, *ihc*, *xpc*, and *ihs*, *xps*.

The full development of the medieval system of abbreviation and contraction was effected at the time when the Carolingian schools were compelling the reform of the handwriting of western Europe. Then came a freer practice of abbreviation by suppression of terminations and the latter portions of words, the omission of which was indicated by the ordinary signs, the horizontal or oblique stroke or the apostrophe; then came also a freer practice of contraction by omitting letters and syllables from the middle as well as the end of words, as oio, *omnino*, prb, *presbyter*; and then from the practice of writing above the line a leading letter of an omitted syllable, as int^{a} = *intra*, t^{r} = *tur*, conventional signs, with special significations, were also gradually developed. Such growths are well illustrated in the change undergone by the semicolon, which was attached to the end of a word to indicate the omission of the termination, as b; = *bus*, q; = *que*, deb; = *debet*, and which in course of time became converted into a z, a form which survives in our ordinary abbreviation, viz. (*i.e.* vi; = *videlicet*). The different forms of contraction were common to all the nations of western Europe. The Spanish scribes, however, attached different values to certain of them. For example, in Visigothic MSS., *qm*, which elsewhere represented *quoniam*, may be read as *quum*; and ꝓ, which elsewhere = *pro*, is here = *per*. Nor must the use of arbitrary symbols for special words be forgotten. These are generally adaptations of the shorthand signs known as Tironian notes. Such are ⁊ = *autem*, ÷ = *est*, ⅋ = *ejus*, ⁊ = *enim*, 7 = *et*, v̇ and u̇ = *ut*, which were employed particularly in early MSS. of English and Irish origin.

By the 11th century the system of Latin contractions had been reduced to exact rules; and from this time onwards it was universally

practised. It reached its culminating point in the 13th century, the period of increasing demand for MSS., when it became more than ever necessary to economize space. After this date the exact formation of the signs of contractions was less strictly observed, and the system deteriorated together with the decline of handwriting. In conclusion, it may be noticed that in MSS. written in the vernacular tongues contractions are more rarely used than in Latin texts. A system suited to the inflexions and terminations of this language could not be readily adapted to other languages so different in grammatical structure.

Palimpsests, &c.—Palimpsest MSS., that is, MSS. written upon material from which older writing has been previously removed by washing or scraping, are described in a separate article (PALIMPSEST). The ornamentation of MSS. is fully dealt with under the headings ILLUMINATED MSS., and MINIATURES.

Writing Implements.—In conclusion, a few words may be added respecting the writing implements employed in the production of MSS. The reed, κάλαμος, *calamus*, was adapted for tracing characters either on papyrus or vellum. By the ancient Egyptians, and also probably by the early Greek scribes in Egypt, it was used with a soft brush-like point, rather as a paint-brush than as a pen. The Greek and Roman scribes used the reed cut to a point and slit like the quill-pen; and it survived as a writing implement into the middle ages. For scratching letters on the waxen tablet the sharp pointed bodkin, στῦλος, γραφεῖον, *stilus*, *graphium*, was necessary, made of iron, bronze, ivory, or other suitable material, with a knobbed or flattened butt-end wherewith corrections could be made by smoothening the wax surface (hence *vertere stilum*, to correct). Although there is no very early record of the use of quills as pens, it is obvious that, well adapted as they are for the purpose and to be had everywhere, they must have

been in request even in ancient times as they afterwards were in the middle ages. Bronze pens, fashioned exactly on the model of the quill-pen, that is in form of a tube ending in a slit nib (sometimes even with a nib at each end), of late Roman manufacture, are still in existence. A score of them are to be found scattered among public and private museums. The ruler for guiding ruled lines was the κανών, *canon*, *regula*; the pencil was the μόλυβδος, *plumbum*, the plummet; the pricker for marking the spacing out of the ruled lines was the διαβάτης, *circinus*, *punctorium*; the pen-knife, γλύφανον, σμίλη, *scalprum*; the erasing-knife, *rasorium*, *novacula*.

Inks.—Inks of various colours were employed from early times. The ink of the early papyri is a deep glossy black; in the Byzantine period it deteriorates. In the middle ages black ink is generally of excellent quality; it tends to deteriorate from the 14th century. But its quality varies in different countries at different periods. Red ink, besides being used for titles and colophons, also served for contrast, as, for example, in glosses. In the Carolingian period entire MSS. were occasionally written in red ink. Other coloured inks—green, violet and yellow—are also found, at an early date. Gold and silver writing fluids were used in the texts of the ancient purple vellum MSS., and writing in gold was reintroduced under Charlemagne for codices of ordinary white vellum. It was introduced into English MSS. in the 10th century.

AUTHORITIES.—H. Geraud, *Essai sur les livres dans l'antiquité* (1840); E. Egger, *Histoire du livre depuis ses origines jusqu'à nos jours* (1880); T. Birt, *Das antike Buchwesen* (1882) and *Die Buchrolle in der Kunst* (1907); W. Wattenbach, *Das Schriftwesen im Mittelalter* (1896); K. Dziatzko, *Untersuchungen über ausgewählte Kapitel des antiken Buchwesens* (1900); J. W. Clark, *The Care of Books* (1901); W. Schubart, *Das Buch bei den Griechen und Römern* (1907); and

generally the authorities quoted in the article PALAEOGRAPHY. See also TEXTUAL CRITICISM. (E. M. T.)

MANUTIUS, the Latin name of an Italian family (Mannucci, Manuzio), famous in the history of printing as organizers of the Aldine press.

1. ALDUS MANUTIUS (1450-1515). Teobaldo Mannucci, better known as Aldo Manuzio, the founder of the Aldine press, was born in 1450 at Sermoneta in the Papal States. He received a scholar's training, studying Latin at Rome under Gasparino da Verona, and Greek at Ferrara under Guarino da Verona. In 1482 he went to reside at Mirandola with his old friend and fellow-student, the illustrious Giovanni Pico. There he stayed two years, prosecuting his studies in Greek literature. Before Pico removed to Florence, he procured for Aldo the post of tutor to his nephews Alberto and Lionello Pio, princes of Carpi. Alberto Pio supplied Aldo with funds for starting his printing press, and gave him lands at Carpi. It was Aldo's ambition to secure the literature of Greece from further accident by committing its chief masterpieces to type. Before his time four Italian towns had won the honours of Greek publications: Milan, with the grammar of Lascaris, Aesop, Theocritus, a Greek Psalter, and Isocrates, between 1476 and 1493; Venice, with the *Erotemala* of Chrysoloras in 1484; Vicenza, with reprints of Lascaris's grammar and the *Erolemata*, in 1488 and 1490; Florence, with Alopa's Homer, in 1488. Of these works, only three, the Milanese Theocritus and Isocrates and the Florentine Homer, were classics.

Aldo selected Venice as the most appropriate station for his labours. He settled there in 1490, and soon afterwards gave to the world editions of the *Hero and Leander* of Musaeus, the *Galeomyomachia*, and the Greek Psalter. These have no date; but they are the earliest tracts issued from his press, and are called by him "Precursors of the Greek Library."

At Venice Aldo gathered an army of Greek scholars and compositors around him. His trade was carried on by Greeks, and Greek was the language of his household. Instructions to type-setters and binders were given in Greek. The prefaces to his editions were written in Greek. Greeks from Crete collated MSS., read proofs, and gave models of calligraphy for casts of Greek type. Not counting the craftsmen employed in merely manual labour, Aldo entertained as many as thirty of these Greek assistants in his family. His own industry and energy were unremitting. In 1495 he issued the first volume of his Aristotle. Four more volumes completed the work in 1497-1498. Nine comedies of Aristophanes appeared in 1498. Thucydides, Sophocles and Herodotus followed in 1502; Xenophon's *Hellenics* and Euripides in 1503; Demosthenes in 1504. The troubles of Italy, which pressed heavily on Venice at this epoch, suspended Aldo's labours for a while. But in 1508 he resumed his series with an edition of the minor Greek orators; and in 1509 appeared the lesser works of Plutarch. Then came another stoppage. The league of Cambray had driven Venice back to her lagoons, and all the forces of the republic were concentrated on a struggle to the death with the allied powers of Europe. In 1513 Aldo reappeared with Plato, which he dedicated to Leo X. in a preface eloquently and earnestly comparing the miseries of warfare and the woes of Italy with the sublime and tranquil objects of the student's life. Pindar, Hesychius, and Athenaeus followed in 1514.

These complete the list of Aldo's prime services to Greek literature. But it may be well in this place to observe that his successors continued his

work by giving Pausanias, Strabo, Aeschylus, Galen, Hippocrates and Longinus to the world in first editions. Omission has been made of Aldo's reprints, in order that the attention of the reader might be concentrated on his labours in editing Greek classics from MSS. Other presses were at work in Italy; and, as the classics issued from Florence, Rome or Milan, Aldo took them up, bestowing in each case fresh industry upon the collation of codices and the correction of texts. Nor was the Aldine press idle in regard to Latin and Italian classics. The *Asolani* of Bembo, the collected writings of Poliziano, the *Hypnerotomachia Poliphili*, Dante's *Divine Comedy*, Petrarch's poems, a collection of early Latin poets of the Christian era, the letters of the younger Pliny, the poems of Pontanus, Sannazzaro's *Arcadia*, Quintilian, Valerius Maximus, and the *Adagia* of Erasmus were printed, either in first editions, or with a beauty of type and paper never reached before, between the years 1495 and 1514. For these Italian and Latin editions Aldo had the elegant type struck which bears his name. It is said to have been copied from Petrarch's handwriting, and was cast under the direction of Francesco da Bologna, who has been identified by Panizzi with Francia the painter.

Aldo's enthusiasm for Greek literature was not confined to the printing-room. Whatever the students of this century may think of his scholarship, they must allow that only vast erudition and thorough familiarity with the Greek language could have enabled him to accomplish what he did. In his own days Aldo's learning won the hearty acknowledgment of ripe scholars. To his fellow workers he was uniformly generous, free from jealousy, and prodigal of praise. While aiming at that excellence of typography which renders his editions the treasures of the book-collector, he strove at the same time to make them cheap. We may perhaps roughly estimate the current price of his pocket series of Greek, Latin and Italian classics, begun in 1501, at 2s. per volume of our present money. The five volumes of the Aristotle cost about £8. His great undertaking was carried on under

continual difficulties, arising from strikes among his workmen, the piracies of rivals, and the interruptions of war. When he died, bequeathing Greek literature as an inalienable possession to the world, he was a poor man. In order to promote Greek studies, Aldo founded an academy of Hellenists in 1500 under the title of the New Academy. Its rules were written in Greek. Its members were obliged to speak Greek. Their names were Hellenized, and their official titles were Greek. The biographies of all the famous men who were enrolled in this academy must be sought in the pages of Didot's *Alde Manuce*. It is enough here to mention that they included Erasmus and the English Linacre.

In 1499 Aldo married Maria, daughter of Andrea Torresano of Asola. Andrea had already bought the press established by Nicholas Jenson at Venice. Therefore Aldo's marriage combined two important publishing firms. Henceforth the names Aldus and Asolanus were associated on the title pages of the Aldine publications; and after Aldo's death in 1515, Andrea and his two sons carried on the business during the minority of Aldo's children. The device of the dolphin and the anchor, and the motto *festina lente*, which indicated quickness combined with firmness in the execution of a great scheme, were never wholly abandoned by the Aldines until the expiration of their firm in the third generation.

2. Paulus Manutius (1512-1574). By his marriage with Maria Torresano, Aldo had three sons, the youngest of whom, Paolo, was born in 1512. He had the misfortune to lose his father at the age of two. After this event his grandfather and two uncles, the three Asolani, carried on the Aldine press, while Paolo prosecuted his early studies at Venice. Excessive application hurt his health, which remained weak during the rest of his life. At the age of twenty-one he had acquired a solid reputation for scholarship and learning. In 1533 Paolo undertook the conduct of his father's business, which had latterly been much neglected by his uncles. In the interregnum

between Aldo's death and Paolo's succession (1514-1533) the Asolani continued to issue books, the best of which were Latin classics. But, though their publications count a large number of first editions, and some are works of considerable magnitude, they were not brought out with the scholarly perfection at which Aldo aimed. The Asolani attempted to perform the whole duties of editing, and to reserve all its honours for themselves, dispensing with the service of competent collaborators. The result was that some of their editions, especially their Aeschylus of 1518, are singularly bad. Paolo determined to restore the glories of the house, and in 1540 he separated from his uncles. The field of Greek literature having been well-nigh exhausted, he devoted himself principally to the Latin classics. He was a passionate Ciceronian, and perhaps his chief contributions to scholarship are the corrected editions of Cicero's letters and orations, his own epistles in a Ciceronian style, and his Latin version of Demosthenes. Throughout his life he combined the occupations of a student and a printer, winning an even higher celebrity in the former field than his father had done. Four treatises from his pen on Roman antiquities deserve to be commemorated for their erudition no less than for the elegance of their Latinity. Several Italian cities contended for the possession of so rare a man; and he received tempting offers from the Spanish court. Yet his life was a long struggle with pecuniary difficulties. To prepare correct editions of the classics, and to print them in a splendid style, has always been a costly undertaking. And, though Paolo's publications were highly esteemed, their sale was slow. In 1556 he received for a time external support from the Venetian Academy, founded by Federigo Badoaro. But Badoaro failed disgracefully in 1559, and the academy was extinct in 1562. Meanwhile Paolo had established his brother, Antonio, a man of good parts but indifferent conduct, in a printing office and book shop at Bologna. Antonio died in 1559, having been a source of trouble and expense to Paolo during the last four years of his life. Other pecuniary embarrassments arose from a contract for supplying fish to

Venice, into which Paolo had somewhat strangely entered with the government. In 1561 pope Pius IV. invited him to Rome, offering him a yearly stipend of 500 ducats, and undertaking to establish and maintain his press there. The profits on publications were to be divided between Paolo Manuzio and the Apostolic camera. Paolo accepted the invitation, and spent the larger portion of his life, under three papacies, with varying fortunes, in the city of Rome. Ill-health, the commercial interests he had left behind at Venice, and the coldness shown him by pope Pius V., induced him at various times and for several reasons to leave Rome. As was natural, his editions after his removal to Rome were mostly Latin works of theology and Biblical or patristic literature.

Paolo married Caterina Odoni in 1546. She brought him three sons and one daughter. His eldest son, the younger Aldus, succeeded him in the management of the Venetian printing house when his father settled at Rome in 1561. Paolo had never been a strong man, and his health was overtaxed with studies and commercial worries. Yet he lived into his sixty-second year, and died at Rome in 1574.

3. Aldus Manutius, Junior (1547-1597). The younger Aldo born in the year after his father Paolo's marriage, proved what is called an infant prodigy. When he was nine years old his name was placed upon the title page of the famous *Eleganze della lingua Toscana e Latina*. The *Eleganze* was probably a book made for his instruction and in his company by his father. In 1561, at the age of fourteen, he produced a work upon Latin spelling, called *Orthographiae ratio*. During a visit to his father at Rome in the next year he was able to improve this treatise by the study of inscriptions, and in 1575 he completed his labours in the same field by the publication of an *Epitome orthographiae*. Whether Aldo was the sole composer of the work on spelling, in its first edition, may be doubted; but he appropriated the subject and made it his own. Probably his greatest

service to scholarship is this analysis of the principles of orthography in Latin.

Aldo remained at Venice, studying literature and superintending the Aldine press. In 1572 he married Francesca Lucrezia daughter of Bartolommeo Giunta, and great-grandchild of the first Giunta, who founded the famous printing house in Venice. This was an alliance which augured well of the Giunta for the future of the Aldines, especially as Aldo had recently found time to publish a new revised edition of Velleius Paterculus. Two years later the death of his father at Rome placed Aldo at the head of the firm. In concert with the Giunta, he now edited an extensive collection of Italian letters, and in 1576 he published his commentary upon the *Ars poetica* of Horace. About the same time, that is to say, about the year 1576, he was appointed professor of literature to the Cancelleria at Venice. The Aldine press continued through this period to issue books, but none of signal merit; and in 1585 Aldo determined to quit his native city for Bologna, where he occupied the chair of eloquence for a few months. In 1587 he left Bologna for Pisa, and there, in his quality of professor, he made the curious mistake of printing Alberti's comedy *Philodoxius* as a work of the classic Lepidus. Sixtus V. drew him in 1588 from Tuscany to Rome; and at Rome he hoped to make a permanent settlement as lecturer. But his public lessons were ill attended, and he soon fell back upon his old vocation of publisher under the patronage of a new pope, Clement VIII. In 1597 he died, leaving children, but none who cared or had capacity to carry on the Aldine press. Aldo himself, though a precocious student, a scholar of no mean ability, and a publisher of some distinction, was the least remarkable of the three men who gave books to the public under the old Aldine ensign. This does not of necessity mean that we should adopt Scaliger's critique of the younger Aldo without reservation. Scaliger called him "a poverty-stricken talent, slow in operation; his work is very commonplace; he aped his father." What is true in this remark lies partly in

the fact that scholarship in Aldo's days had flown beyond the Alps, where a new growth of erudition, on a basis different from that of the Italian Renaissance, had begun.

See Renouard's *Annales de l'imprimerie des Aldes* (Paris, 1834); Didot's *Alde Manuce* (Paris, 1873); Omont's *Catalogue* of Aldine publications (Paris, 1892).

(J. A. S.)

MANWARING, ROBERT, English 18th-century furniture designer and cabinet maker. The dates of his birth and death are unknown. He was a contemporary and imitator of Chippendale, and not the least considerable of his rivals. He prided himself upon work which he described as "genteel," and his speciality was chairs. He manifests the same surprising variations of quality that are noticed in the work of nearly all the English cabinet-makers of the second half of the 18th century, and while his best had an undeniable elegance his worst was exceedingly bad—squat, ill-proportioned and confused. Some of his chairbacks are so nearly identical with Chippendale's that it is difficult to suppose that the one did not copy from the other, and most of the designs of the greater man enjoyed priority of date. During a portion of his career Manwaring was a devotee of the Chinese taste; he likewise practised in the Gothic manner. He appears to have introduced the small bracket between the front rail of the seat and the top of the chair leg, or at all events to have made such constant use of it that it has come to be regarded as characteristic of his work. Manwaring

described certain of his own work as “elegant and superb,” and as possessing “grandeur and magnificence.” He did not confine himself to furniture but produced many designs for rustic gates and railings, often very extravagant. One of his most absurd rural chairs has rock-work with a waterfall in the back.

Among Manwaring’s writings were *The Cabinet and Chair Makers’ Real Friend and Companion, or the Whole System of Chairmaking Made Plain and Easy* (1765); *The Carpenters’ Compleat Guide to Gothic Railing* (1765); and *The Chair-makers’ Guide* (1766).

MANYCH, a river and depression in S. Russia, stretching between the lower river Don and the Caspian Sea, through the Don Cossacks territory and between the government of Astrakhan on the N. and that of Stavropol on the S. During the greater part of the year it is either dry or occupied in part by a string of saline lakes (*limans* or *ilmens*); but in spring when the streams swell which empty into it, the water flows in two opposite directions from the highest point (near Shara-Khulusun). The western stream flows westwards, with an inclination northwards, until it reaches the Don, though when the latter river is running high, its water penetrates some 60 miles up the Manych. The eastern stream dies away in the sandy steppe about 25 miles from the Caspian, though it is said sometimes to reach the Kuma through the Huiduk, a tributary of the Kuma. Total length of the depression, 330 m. For its significance as a former (geologic) connexion

between the Sea of Azov and the Caspian Sea, see CASPIAN SEA. By some authorities the Manych depression is taken as part of the boundary between Europe and Asia.

MANYEMA (*Una-Ma-Nyema*, eaters of flesh), a powerful and warlike Bantu-Negroid people in the south-east of the Congo basin. Physically they are of a light colour, with well formed noses and not over-full lips, the women being described as singularly pretty and graceful. Manyemaland was for the greater part of the 19th century an Eldorado of the Arab slave raiders.

MANZANARES, a town of Spain, in the province of Ciudad Real, on the river Azuer, a large sub-tributary of the Záncara, and on the railways from Madrid to Ciudad Real and Liná res. Pop. (1900), 11,229. Manzanares is one of the chief towns of La Mancha, and thus in the centre of the district described by Cervantes in *Don Quixote*. Its citadel was founded as a Christian fortress after the defeat of the Moors at Las Navas de

Tolosa (1212). Bull-fights were formerly held in the main *plaza*, where galleries to accommodate spectators were built between the buttresses of an ancient parish church. Manzanares has manufactures of soap, bricks and pottery, and an active trade in wheat, wine, spirits, aniseed and saffron.

MANZANILLO, a town and port on the Pacific coast of Mexico, in the state of Colima, 52 m. by rail W.S.W. of the city of that name. It is situated on a large harbour partly formed and sheltered by a long island extending southwards parallel with the coast. Southward also, and in the vicinity of the town, is the large stagnant, shallow lagoon of Cayutlán which renders the town unhealthy. Manzanillo is a commercial town of comparatively recent creation. Its new harbour works, the construction of which was begun in 1899, and its railway connexion with central Mexico, promise to make it one of the chief Pacific ports of the republic. These works include a breakwater 1300 ft. long, with a depth of 12 to 70 ft. and a maximum breadth of 320 ft. at the base and 25 ft. on top, and all the necessary berthing and mechanical facilities for the handling of cargoes. A narrow-gauge railway was built between Colima and Manzanillo toward the end of the nineteenth century, but the traffic was only sufficient for a tri-weekly service up to 1908, when the gauge was widened and the railway became part of the Mexican Central branch, completed in that year from Irapuato through Guadalajara to Colima. The exports include hides and skins, palm leaf hats, Indian corn, coffee, palm oil, fruit, lumber and minerals.

MANZANILLO, an important commercial city of Cuba, in Santiago province, on the gulf of Guacanabo, about 17 m. S. of the mouth of the Rio Cauto, on the shore of Manzanillo Bay. Pop. (1907), 15,819. It is shut off to the east and south by the Sierra Maestra. Besides the Cauto, the rivers Yara and Buey are near the city. Manzanillo is the only coast town of importance between Trinidad and Santiago. It exports large quantities of sugar, hides, tobacco, and bees-wax; also some cedar and mahogany. The history of the settlement begins in 1784, but the port was already important at that time for a trade in woods and fruits; French and English corsairs resorted thither for shipbuilding woods. The settlement was sacked by the French in 1792, and in the following year a fort was built for its protection. In 1833 it received an *ayuntamiento* (council) and in 1837, for its "loyalty" in not following the lead of Santiago in proclaiming the Spanish Constitution, received from the crown the title of *Fiel*. In 1827 the port was opened to commerce, national and foreign.

MANZOLLI, PIER ANGELO, Italian author, was born about the end of the fifteenth century at La Stellata, near Ferrara. He wrote a poem entitled *Zodiacus vitae*, published at Basel in 1543, and dedicated to Hercules II. of Ferrara. The poem is full of didactic writing on the subject of human happiness in connexion with scientific knowledge, and combines metaphysical speculation with satirical attacks on ecclesiastical hypocrisy, and especially on the Pope and on Luther. It was translated into several languages, but fell under the ban of the Inquisition on the ground of its rationalizing tendencies.

MANZONI, ALESSANDRO FRANCESCO TOMMASO ANTONIO (1785-1873), Italian poet and novelist, was born at Milan on the 7th of March 1785. Don Pietro, his father, then about fifty, represented an old family settled near Lecco, but originally feudal lords of Barzio, in the Valsassina, where the memory of their violence is still perpetuated in a local proverb, comparing it to that of the mountain torrent. The poet's maternal grandfather, Cesare Beccaria, was a well-known author, and his mother Giulia a woman of some literary ability. Manzoni's intellect was slow in maturing, and at the various colleges where his school days were passed he ranked among the dunces. At fifteen, however, he developed a passion for poetry, and wrote two sonnets of considerable merit. On the death of his father in 1805, he joined his mother at Auteuil, and spent two years there, mixing in the literary set of the so-

called “ideologues,” philosophers of the 18th century school, among whom he made many friends, notably Claude Fauriel. There too he imbibed the negative creed of Voltairianism, and only after his marriage, and under the influence of his wife, did he exchange it for that fervent Catholicism which coloured his later life. In 1806-1807, while at Auteuil, he first appeared before the public as a poet, with two pieces, one entitled *Urania*, in the classical style, of which he became later the most conspicuous adversary, the other an elegy in blank verse, on the death of Count Carlo Imbonati, from whom, through his mother, he inherited considerable property, including the villa of Brusuglio, thenceforward his principal residence.

Manzoni’s marriage in 1808 to Henriette Blondel, daughter of a Genevese banker, proved a most happy one, and he led for many years a retired domestic life, divided between literature and the picturesque husbandry of Lombardy. His intellectual energy at this period was devoted to the composition of the *Inni sacri*, a series of sacred lyrics, and a treatise on Catholic morality, forming a task undertaken under religious guidance, in reparation for his early lapse from faith. In 1818 he had to sell his paternal inheritance, as his affairs had gone to ruin in the hands of a dishonest agent. His characteristic generosity was shown on this occasion in his dealings with his peasants, who were heavily indebted to him. He not only cancelled on the spot the record of all sums owing to him, but bade them keep for themselves the whole of the coming maize harvest.

In 1819 Manzoni published his first tragedy, *Il Conte di Carmagnola*, which, boldly violating all classical conventionalisms, excited a lively controversy. It was severely criticized in the *Quarterly Review*, in an article to which Goethe replied in its defence, “one genius,” as Count de Gubernatis remarks, “having divined the other.” The death of Napoleon in 1821 inspired Manzoni’s powerful stanzas *Il Cinque maggio*, the most popular lyric in the Italian language. The political events of that year, and

the imprisonment of many of his friends, weighed much on Manzoni's mind, and the historical studies in which he sought distraction during his subsequent retirement at Brusuglio suggested his great work. Round the episode of the *Innominato*, historically identified with Bernardino Visconti, the novel *I Promessi sposi* began to grow into shape, and was completed in September 1822. The work when published, after revision by friends in 1825-1827, at the rate of a volume a year, at once raised its author to the first rank of literary fame. In 1822, Manzoni published his second tragedy *Adelchi*, turning on the overthrow by Charlemagne of the Lombard domination in Italy, and containing many veiled allusions to the existing Austrian rule. With these works Manzoni's literary career was practically closed. But he laboriously revised *I Promessi sposi* in the Tuscan idiom, and in 1840 republished it in that form, with a sort of sequel, *La Storia della Colonna infame*, of very inferior interest. He also wrote a small treatise on the Italian language.

The end of the poet's long life was saddened by domestic sorrows. The loss of his wife in 1833 was followed by that of several of his children, and of his mother. In 1837 he married his second wife, Teresa Borri, widow of Count Stampa, whom he also survived, while of nine children born to him in his two marriages all but two preceded him to the grave. The death of his eldest son, Pier Luigi, on the 28th of April 1873, was the final blow which hastened his end; he fell ill immediately, and died of cerebral meningitis, on the 22nd of May. His country mourned him with almost royal pomp, and his remains, after lying in state for some days, were followed to the cemetery of Milan by a vast cortège, including the royal princes and all the great officers of state. But his noblest monument was Verdi's *Requiem*, specially written to honour his memory.

Biographical sketches of Manzoni have been published by Cesare Cantù (1885), Angelo de Gubernatis (1879), Arturo Graf (1898). Some

of his letters have been published by Giovanni Sforza (1882).

MAORI (pronounced “Mowri”; a Polynesian word meaning “native,” “indigenous”; the word occurs in distinction from *pakeha*, “stranger,” in other parts of Polynesia in the forms *Maoi* and *Maoli*), the name of the race inhabiting New Zealand when first visited by Tasman in 1642.

That they were not indigenous, but had displaced an earlier Melanesian or Papuan race, the true aborigines, is certain. The Maoris are Polynesians, and, in common with the majority of their kinsfolk throughout the Pacific, they have traditions which point to Savaii, originally Savaiki, the largest island of the Samoan group, as their cradleland. They say they came to New Zealand from “Hawaiki,” and they appear to distinguish between a large and small, or a nearer and farther, “Hawaiki.” “The seed of our coming is from Hawaiki; the seed of our nourishing, the seed of mankind.” Their great chief, Te Kupe, first landed, they say, on Aotearoa, as they called the north island, and, pleased with his discovery, returned to Hawaiki to tell his fellow-countrymen. Thereafter he returned with seven war canoes, each holding a hundred warriors, priests, stone idols and sacred weapons, as well as native plants and animals. Hawaiki, the name of Te Kupe’s traditional home, is identical with several other Polynesian place-names, *e.g.* Hawaii, Apai in the Tonga Islands, Evava in the Marquesas, all of which are held to be derived from Savii or Savaiki. Dr Thomson, in his *Story of New Zealand*, quotes a Maori tradition, published by Sir George Grey, that certain islands, among which it names Rarotonga, Parima and Manono, are islands near

Hawaiki. The Rarotongas call themselves Maori, and state that their ancestors came from Hawaiki, and Parima and Manono are the native names of two islands in the Samoan group. The almost identical languages of the Rarotongas and the Maoris strengthen the theory that the two peoples are descended from Polynesians migrating, possibly at widely different dates, from Samoa. The distance from Rarotonga to New Zealand is about 2000 m., and, with the aid of the trade wind, large canoes could traverse the distance within a month. Moreover the fauna and flora of New Zealand in many ways resemble those of Samoa. Thus it would seem certain that the Maoris, starting from "further Hawaiki," or Samoa, first touched at Rarotonga, "nearer Hawaiki," whence, after forming a settlement, they journeyed on to New Zealand. Maori tradition is explicit as to the cause of the exodus from Samoa, gives the names of the canoes in which the journey was made and the time of year at which the coast of New Zealand was sighted. On the question of the date a comparison of genealogies of Maori chiefs shows that, up to the beginning of the 20th century, about eighteen generations or probably not much more than five centuries had passed since the first Maori arrivals. There is some evidence that the "tradition of the six canoes" does not represent the first contact of the Polynesian race with New Zealand. If earlier immigrants from Samoa or other eastern Pacific islands arrived they must have become absorbed into the native Papuan population —arguing from the absence of any distinct tradition earlier than that "of the six canoes." Some have sought to find in the Morioris of Chatham Island the remnants of this Papuan-Polynesian population, expelled by Te Kupe and his followers. The extraordinary ruined fortifications found, and the knowledge of the higher art of war displayed by the Maoris, suggest (what is no doubt the fact) that there was a hard fight for them when they first arrived, but the greatest resistance must have been from the purer Papuan inhabitants, and not from the half-castes who were probably easily overwhelmed. The shell heaps found on the coasts and elsewhere dispose of

the theory that New Zealand was uninhabited or practically so six centuries back.

Any description of the Maoris, who in recent years have come more and more under the influence of white civilization, must necessarily refer rather to what they have been than what they are. Physically the Maoris are true Polynesians, tall, well-built, with straight or slightly curved noses, high foreheads and oval faces. Their colour is usually a darker brown than that of their kinsfolk of the eastern Pacific, but light-complexioned Maoris, almost European in features, are met with. Their hair is black and straight or wavy, scarcely ever curly. They have long been celebrated for their tattooing, the designs being most elaborate.

Among the most industrious of Polynesian races, they have always been famed for wood-carving; and in building, weaving and dyeing they had made great advances before the whites arrived. They are also good farmers and bold seamen. In the Maori wars they showed much strategic skill, and their knowledge of fortification was very remarkable. Politically the Maoris have always been democratic. No approach to a monarchy ever existed. Each tribe under its chief was autonomous. Tribal lands were held in common and each man was entitled to a share in the products. They had slaves, but so few as not to alter the social conditions. Every Maori was a soldier, and war was the chief business and joy of his life. Tribal wars were incessant. The weapons were wooden spears, clubs and stone tomahawks. Cannibalism, which earned them in earlier years a terrible name, was generally restricted to the bloodthirsty banquets which always followed a victory. The Maoris ate their enemies' hearts to gain their courage, but to whatever degree animistic beliefs may have once contributed to their cannibalism, it is certain that long before Captain Cook's visit religious sanction for the custom had long given place to mere gluttonous enjoyment.

The Maoris had no regular marriage ceremony. Polygamy was universal, and even to-day they are not strictly monogamous. The power of the husband over the wife was absolute, but women took their meals with the men, were allowed a voice in the tribe's affairs, and sometimes accompanied the men into battle. Some tribes were endogamic, and there matriarchy was the rule, descent being traced through the female line. Ferocious as they were in war, the Maoris are generally hospitable and affectionate in their home-life, and a pleasant characteristic, noticed by Captain Cook, is their respect and care of the old. The Maoris buried their dead, the cemeteries being ornamented with carved posts. Their religion was a nature-worship intimately connected with the veneration of ancestors. There was a belief in the soul, which was supposed to dwell in the left eye. They had no doubt as to a future state, but no definite idea of a supreme being. They had no places of worship, nor, though they had sacred wooden figures, is there any reason to consider that they were idolaters in the strict sense of the word. The custom of taboo was very fully developed. Nowadays they are all nominally Christians. While they had no written language, a considerable oral literature of songs, legends and traditions existed. Their priesthood was a highly trained profession, and they had schools which taught a knowledge of the stars and constellations, for many of which they had names. All Maoris are natural orators and poets, and a chief was expected to add these accomplishments to his prowess as a warrior or his skill as a seaman. The Maoris of to-day are law-abiding, peaceable and indolent. They have been called the Britons of the south, and their courage in defending their country and their intelligence amply justify the compliment. By the New Zealanders they are cordially liked. At the census of 1906 they numbered 47,731, as against 45,470 in 1874; and there were 6516 half-castes. See also POLYNESIA and SAMOA.

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MAP (or MAPES), WALTER (d. *c.* 1208/9), medieval ecclesiastic, author and wit, to whose authority the main body of prose Arthurian literature has, at one time or another, been assigned, flourished in the latter part of the 12th and early years of the 13th centuries. Concerning the date of his birth and his parentage nothing definite is known, but as he ascribes his position at court to the merits of his parents they were probably people of some importance. He studied at Paris under Girard la Pucelle, who began to teach in or about 1160, but as he states in his book *De nugis curialium* that he was at the court of Henry II. before 1162, his residence at Paris must have been practically comprised in the decade 1150-1160.

Map's career was an active and varied one; he was clerk of the royal household and justice itinerant; in 1179 he was present at the Lateran council at Rome, on his way thither being entertained by the count of Champagne; at this time he apparently held a plurality of ecclesiastical benefices, being a prebend of St Paul's, canon and precentor of Lincoln and parson of Westbury, Gloucestershire. There seems to be no record of his

ordination, but as he was a candidate for the see of Hereford in 1199 it is most probable that he was in priest's orders. The last reference to him, as living, is in 1208, when an order for payment to him is on record, but Giraldus Cambrensis, in the second edition of his *Hibernica*, redacted in 1210, utters a prayer for his soul, "cujus animae propitietur Deus," a proof that he was no longer alive.

The special interest of Map lies in the perplexing question of his relation to the Arthurian legend and literature. He is invariably cited as the author of the *Lancelot* proper (consisting of two parts), the *Queste* and the *Mort Artus*, all three of which are now generally found in one manuscript under the title of *Lancelot*. The *Mort Artus*, however, we know to be the prose working over of an earlier and independent poem. Sundry manuscripts of the yet more extensive compilation which begins with the *Grand Saint Graal* also refer to Map as having composed the cycle in conjunction with Robert de Borron, to whom, as a rule, the *Grand Saint Graal* and *Merlin* are exclusively assigned. The curious *Merlin* text, Bibl. Nat. 337 (fonds Français), refers throughout to Map as authority; and the enormous *Lancelot* codex, B. N. 112, a combination of the *Lancelot* and the *Tristan*, also couples his name with that of Robert de Borron. In fact it may safely be said that, with the exception of the prose *Tristan*, always attributed either to Luces de Gast, or Hélie de Borron, the authority of Map has been invoked for the entire vast mass of Arthurian prose romantic literature. Now it is practically impossible that one man, and that one an occupier of court and public offices, constantly employed in royal and public business, very frequently travelling abroad (*e.g.* we know he was at Limoges in 1173; at Rome in 1179; in Anjou in 1183; and at Angers in 1199), could have found the necessary leisure. On this point we have the testimony of his one undoubted work, *De nugis curialium*, which he tells us he composed "by snatches" during his residence at court. *De nugis* is a comparatively small book; if it were difficult to find leisure for that, much more would it have

been difficult to find the time requisite for the composition of one only of the many long-winded romances which have been fathered on Map. Giraldus Cambrensis, with whom he was on most friendly terms, and who frequently refers to and quotes him, records a speech in which Map contrasted Giraldus' labours with his own, apparently to the disadvantage of the latter, "vos scripta dedistis, et nos verba"—a phrase which has been interpreted as meaning that Map himself had produced no literary work. But inasmuch as the *De nugis* is undoubtedly, and certain satirical poems directed against the loose life of the clergy of the day most probably, his work, the speech must not be taken too literally. It seems difficult also to believe that Map's name should be so constantly connected with our Arthurian tradition without any ground whatever; though it must be admitted that he himself never makes any such claim—the references in the romances are all couched in the third person, and bear no sign of being other than the record by the copyist of a traditional attribution.

A different and very interesting piece of evidence is afforded by the *Ipomedon* of Hue de Rotelande; in relating how his hero appeared at a tournament three days running, in three different suits of armour, red, black and white, the author remarks,

Sul ne sai pas de mentir l'art
Walter Map reset ben sa part.

This apparently indicated that Map, also, had made himself responsible for a similar story. Now this incident of the "Three Days' Tournament" is found alike in the prose *Lancelot* and in the German *Lanzelet*, this latter translated from a French poem which, in 1194, was in the possession of Hugo de Morville. The *Ipomedon* was written somewhere in the decade 1180-1190, and there is no evidence of the prose romance having then been in

existence. We have no manuscript of any prose Arthurian romance earlier than the 13th century, to which period Gaston Paris assigned them; they are certainly posterior to the verse romances. Chrétien de Troyes, in his *Cligés* (the date of which falls somewhere in the decade 1160-1170), knew and utilized the story of the "Three Days' Tournament," and moreover makes Lancelot take part in it. Map was, as we have seen, frequently in France; Chrétien had for patroness Marie, countess of Champagne, step-daughter to Henry II., Map's patron; Map's position was distinctly superior to that of Chrétien. Taking all the evidence into consideration it seems more probable that Map had, at a comparatively early date, before he became so important an official, composed a poem on the subject of Lancelot, which was the direct source of the German version, and which Chrétien also knew and followed.

The form in which certain of the references to him are couched favours the above view; the compiler of *Guiron le Cortois* says in his prologue that "*maistre Gautier Map qui fu clers au roi Henry—devisa cil l'estoire de monseigneur Lancelot du Lac, que d'autre chose ne parla il mie gramment en son livre*"; and in another place he refers to Map, "*qui fit lou propre livre de monsoingnour Lancelot dou Lac*." Now only during the early part of his career could Map fairly be referred to as simple "*clers au roi Henry*," and both extracts emphasize the fact that his work dealt, almost exclusively, with Lancelot. Neither of these passages would fit the prose romance, as we know it, but both might well suit the lost French source of the *Lanzelet*; where we are in a position to compare the German versions of French romances with their originals we find, as a rule, that the translators have followed their source faithfully.

One of the references to Map's works in the *Merlin* manuscript above referred to (B.N. 337) has an interesting touch not found

elsewhere. After saying how Map translated the romance from the Latin at the bidding of King Henry, the usual statement, the scribe adds "*qui riche loier l'en dona*." It is of course possible that Map's rise at court may have been due to his having hit the literary taste of the monarch, who, we know, was interested in the Arthurian tradition, but it must be admitted that direct evidence on the subject is practically nil, and that in the present condition of our knowledge we can only advance possible hypotheses.

See art. "Map" in *Dict. Nat. Biog. De nugis curialium* and the *Latin Poems attributed to Map* have been edited for the Camden Society by T. Wright (1841). For discussion of his authorship of the *Lancelot* cf. *The Three Days' Tournament*, Grimm Library XV. See also under LANCELOT. The passages relating to Map cited above have been frequently quoted by scholars, *e.g.* Hucher, *Le Grand Saint Graal*; Paulin Paris, *Romans de la Table Ronde*; Alfred Nutt, *Studies in the Legend of the Holy Grail*.

(J. L. W.)

*** END OF THE PROJECT GUTENBERG EBOOK ENCYCLOPAEDIA BRITANNICA, 11TH EDITION, "MALTA" TO "MAP, WALTER" ***

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