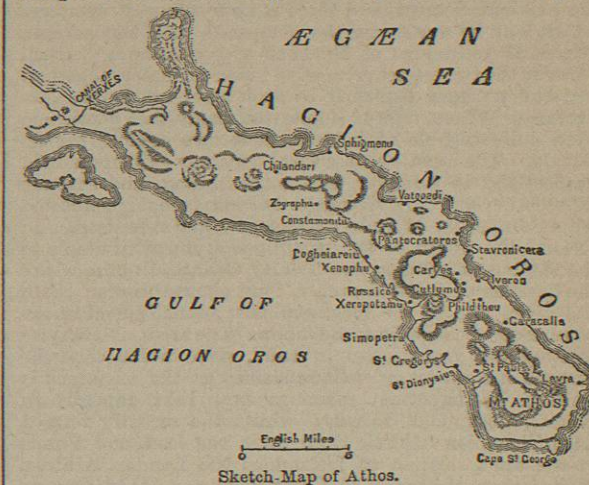


or mistress of Ptah, the seven cows being the mystical companions of the Apis, the second life or incarnation of the god of Memphis. She was also represented under the attributes and with the titles of the goddess Nut, or the Egyptian Rhea. The cow of Athor wore on its head the solar disk, and hawk feather plumes, like Amen Ra; and in this character as the great cow she has on some monuments her human head replaced by that of a cow wearing a disk, or the disk and plumes. This emblem also appears in her type at a later period, when her head is represented with long tresses curled into a spiral at the end, and she has the ears of a cow instead of human ears. Her head is then surmounted by a doorway or its cornice, emblem of the abode of the sun, which she represented. This is sometimes surmounted by the disk and horns. The handle of the sistrum, a musical instrument with bars, was generally made in shape of this head and cornice, as were also the capitals of the columns of Abusimbel, Denderah, and other temples, and the ægis and prows of certain arks. As the goddess of beauty and youth, many of the queens of Egypt assumed her type and attributes, and young females after death, at the Ptolemaic and subsequent periods, had their names preceded by that of the goddess, as both sexes had "Osiris" from the period of the 19th dynasty, that of Athor being a later substitute, and for females only. The third month of the Egyptian year was named Athor after her, and the fish *aten* or *latus*, a kind of carp, was sacred to her. The names and titles of Athor were very numerous, and she is named in the inscriptions the lady or mistress of Silsilis, Abusimbul, Pselcis, Ombos, Hermonthis, Apollonopolis Magna, and Heliopolis; but the chief site of her worship was Denderah, or Tentyris, where she is mentioned under many names, and all the different festivals held in her honour are recorded in the calendar of the temple. Athor is one of the oldest of the Egyptian deities, and her worship continued till the fall of Pantheism and substitution of Christianity. Her worship passed from Egypt to the neighbouring isles, cow-headed figures of the goddess having been discovered in Cyprus. Her figures and representation are common. Jablonski, *Panth.*; Wilkinson, *Manners and Customs*, iv. 387; Birch, *Gall. Antiq.*, p. 25; Duemichen, *Bauurkunde der Dendera*, Leip. 1865.

ATHOS is, strictly speaking, the terminal peak of the most eastern of the three peninsular promontories which stretch south from the coast of Turkey (*Macedonia*), like the prongs of a trident, into the Archipelago. The name is, however, frequently extended to the whole peninsula which was formerly known as Acte. The peak rises like a pyramid, with a steep summit of white marble, to a height of 6780 feet, and can be seen at sunset from the plain of Troy on the one hand, and on the other from the slopes of Olympus. The whole peninsula is remarkable for the beauty of its scenery, with rocky heights and richly-wooded flanks, ravines "embowered from the light," and glimpses or free outlook over the surrounding sea. The climate is for the most part healthy and pleasant, though the western side is perhaps too much exposed to the heats of summer; and Lucian assures us that in ancient times the inhabitants were famous for longevity. Several towns, such as Sane, Dium, Olophyxus, Cleonæ, are mentioned by Greek and Latin writers as existing in the Peninsula; but none of them seem to have attained any great importance, and the most remarkable event in the ancient history of Athos is the construction by Xerxes of a ship-canal across the isthmus between the outer sea and the Singitic gulf. Traces of this canal, which was regarded by Juvenal as a Greek myth, have been found almost right across the neck of land, and leave no doubt of the truth of the story. In more modern times the district of Athos has been famous for

the number of hermits and monks that have found shelter in its retreats. No fewer than 935 churches, chapels, and oratories are said to exist, and many of the communities possess considerable wealth. It is believed that, with the exception of the dwellings of Pompeii, some buildings in



Athos are the oldest specimens of domestic architecture in Europe; the shrines are in many cases richly decorated with goldsmith's work of great antiquity; the wealth of the monastic libraries in illuminated manuscripts has long been celebrated; and nowhere, according to Mr Tozer, can the Byzantine school of painting be studied with equal advantage. The date of the oldest religious foundation in the peninsula is not clearly ascertained, and the traditional chronology of the monks themselves can hardly be trusted. A bull of Romanus Lecapenus speaks of the restoration of the monastery of Xeropotamu in 924, and as early as 885 a rescript of Basil the Macedonian forbids the molestation of the "holy hermits." Lavra, on Mount Athos proper, was founded by St Athanasius in 960; the village of Caryes or "The Hazels," was appointed as the seat of government about the same time; and shortly afterwards there followed the establishments Iveron (τῶν Ἰβήρων), Vatopedi (βατοπεδίου), and Sphigmeneu (τοῦ Ἐσφιγμένου). The family of the Comneni (1056-1204) bestowed great privileges on the existing monasteries, and added to their number. In the reign of Alexius the first purely Slavonic monastery (that of Chilandari) was founded by the Servian prince Stephen Nemenja. The taking of Constantinople by the Latins in 1204 brought persecution and pillage on the monks; this reminded them of earlier Saracenic invasions, and led them to appeal for protection to Pope Innocent III., who gave them a favourable reply. Under the Palæologi they recovered their prosperity, and were enriched by gifts from various sources. In the 14th century the peninsula became the chosen retreat of several of the emperors, and the monasteries were thrown into commotion by the famous dispute about the mystical Hesychasts. Their numbers were gradually increased by the foundation of St Dionysius, Simopetra, Constamonitu, Russicó, St Paul. In the 15th century the monks made terms with the Turkish conqueror Amurath, and have since been molested by none of the sultans, except Soliman the Magnificent, who laid waste some parts of the peninsula. In 1545 Stavroniceta, the last monastery, was added to the list. The hospodars of Wallachia, who were recognised as the protectors of Athos, enriched the communities with lands: but a process of secularisation was commenced by

Capodistrias, who confiscated their holdings in Greece; and more recently they have been stripped of their possessions in the Danubian principalities. They still retain some property in parts of the Archipelago. A Turkish official resides at Caryes, and collects the taxes, which amount to about ten shillings a head; but for the most part the peninsula is autonomous, being governed by an administrative body of four presidents (*ἐπιστάται*), one of whom bears the title of "First Man of Athos," and a representative body called the Holy Synod, which consists of twenty members, one from each of the monasteries proper. These twenty communities are partly Cænobitic, with a common stock and a warden, and partly Idiorhythmic, with a kind of republican government and great individual liberty. Besides these regular monasteries, there are a number of *ἀσκητήρια*, or sketes, which consist of several small associations gathered round a central church, and numerous little communities known as *καθίσματα*, or retreats, as well as genuine hermitages. Harmony is not always maintained between the different establishments, as was shown by a bitter dispute about a water-course between Cutlumusi and Pantocrotoros, which led to the interference of the British consuls of Salonica and Cavalla, in answer to an appeal from some Ionian monks who were British subjects (1853). For the most part, however, the inhabitants of Athos are quiet and moderately industrious. They are said to number about 3000, all men; for no female, even of the lower animals, is permitted to desecrate the precincts of the Holy Mountain.

"Descriptio Montis Atho et xxii. ejus Monast." by Jo. Comnenus in Montfaucon's *Palæographia Græca*; Georgirenes, *Description of Present State of Samos, Palmos, Nicaria, and Mount Athos*, Lond. 1678; Lieut. Webber Smith, "On Mount Athos," &c., in *Journ. Roy. Geog. Soc.*, 1837; Curzon, *Visits to Monasteries in the Levant*, 1849; Fallmerayer, *Fragmenta aus dem Orient*, 1845; Gass, *Commentatio Historica*, &c., and *Zur Geschichte*, &c., 1866; Ramer's *Hist. Taschenbuch*, 1860 (art. by Pischon); Report by M. Minoide Minas, 1846; J. Müller, *Denkmäler in den Klöstern von Athos*; Langlois, *Athos*, &c.; Didron's *Iconographie Chrétienne*, 1844; *Journal Asiatique*, 1867; Tozer's *Highlands of Turkey*, 1869.

ATHY, a market-town of Ireland, county of Kildare, 34 miles S.W. of Dublin. It is a station on the Great Southern and Western Railway, and is intersected by the river Barrow, which is here crossed by a bridge of five arches. It has a church, a Roman Catholic chapel, a Presbyterian and a Methodist meeting-house, court-house, jail, two banks, hospital, dispensary, barracks, &c. Adjoining the town is a small chapel, an ancient cemetery, and a small Dominican monastery. Previous to the Union it

returned two members to the Irish parliament. The principal trade is in corn, which is ground at the neighbouring mills. Population in 1871, 4510.

ATINA, a town of Naples, province of Terra di Lavoro, near the Melfa, and 12 miles S.E. of Sora. It has a cathedral, convent, and hospital, with about 5000 inhabitants; but it is chiefly remarkable for its ancient remains, consisting of portions of its walls, the ruins of an extensive aqueduct, and numerous other structures, besides monuments and inscriptions. The city is of great antiquity, and was a place of importance down to the days of the Roman empire. It is remarkable now, as of old, for the exceptional coolness of its situation.

ATITLAN, a lake in the department of Solola, in Guatemala, 20 miles long, with an average breadth of 9 miles. It seems to occupy the crater of an extinct volcano, and its depth is reported to be very great. The scenery in the neighbourhood is striking and picturesque, the volcano of Atitlan rearing its head 12,500 feet above the level of the sea. A little Indian town, Santiago de Atitlan, nestles at the foot of the mountain.

ATLANTA, the capital of Georgia, one of the United States of North America, is situated about 7 miles to the S.E. of the Chattahoochee River, at an elevation of 1100 feet above the sea. Laid out in 1845, and incorporated as a city in 1847, it has since rapidly increased. It is the centre of a large trade in grain and cotton, and has extensive railway communication in all directions. Engineering work of various kinds is carried on, as well as the manufacture of cast-iron, flour, and tobacco. There are two national and two savings banks. Educational institutions are numerous, and comprise the North Georgia Female College, Oglethorpe College, a medical college, a university for men of colour, and a variety of schools. The state library contains upwards of 16,000 volumes. There are about thirty churches of different denominations, the Methodists being most largely represented, and one of their churches ranking among the finest buildings in the city. During the war Atlanta was the centre of important military operations, and suffered greatly in consequence (1864). It was strongly fortified by the Confederates, and defended, first by General Joseph E. Johnston, and then by General Hood, against the attack of General Sherman. Hood was compelled to evacuate the city, and Sherman afterwards retired to Chattanooga,—movements which occasioned the destruction by fire of the greater part of the buildings, both public and private. Population—(1860), 9554; (1870), 21,789.

ATLANTIC OCEAN

Plate 1

THE designation Atlantic Ocean, originally given to the sea that lies beyond the great range of Atlas in North-western Africa, has come to be applied, with the extension of geographical knowledge, to the whole of that vast ocean which occupies the wide and deep trough that separates the New from the Old World. Its limits are variously defined; some geographers regarding it as extending from pole to pole, whilst others consider it as bounded at its northern and southern extremities by the Arctic and Antarctic circles respectively. As the peculiarity of the physical conditions of the Polar Seas renders it on every account more appropriate to describe them under a separate head (POLAR REGIONS), the Atlantic will be here treated as bounded at the north by the Arctic circle, which nearly corresponds with the natural closing-in of its basin by the approach of the coasts of Norway and Greenland with Iceland lying between them; while at the south, where the basin is at its widest, its only boundary is the Antarctic

circle. The line which separates its southern extension from the Indian Ocean may be considered to be the meridian of Cape Agulhas, the southernmost point of the African continent; whilst the boundary between the South Atlantic and South Pacific would be formed in like manner by the meridian of Cape Horn. Although the Baltic and the Mediterranean are commonly regarded as appendages to the Atlantic, yet their physical conditions are so peculiar as to require separate treatment. (See BALTIC and MEDITERRANEAN.)

Every physical geographer who has written upon the Atlantic has noticed the curious parallelism between its eastern and its western borders,—their salient and retiring angles corresponding very closely to each other. Thus, beginning at the north we see that the projection formed by the British Islands (which extends much further westwards at 100 fathoms below the surface than it does above the sea-level), answers to the wide entrance to Baffin's Bay;

whilst, on the other hand, the projection of the American coast at Newfoundland answers to the Bay of Biscay. Further south, the great rounded prominence of Northern Africa corresponds with the vast bay that stretches from Nova Scotia to St Thomas; whilst the angular projection of South America towards the east corresponds with that receding portion of the mid-African coast-line which is known as the Gulf of Guinea.

This correspondence suggested to Humboldt the idea that the Atlantic basin was originally excavated by a very violent rush of water from the south, which, being repulsed by the mountain ranges of Brazil, was directed by them towards the coast of Africa, and formed the Gulf of Guinea; being there checked and turned to the west by the mountains of Upper Guinea, the stream excavated the Caribbean Sea and the Gulf of Mexico; and issuing thence, it ran between the mountains of North America and Western Europe, until it gradually diminished in velocity and force, and at length subsided. Another writer speaks of the basin of the Atlantic as an immense rift, made by some terrible force, which rent the surface-land asunder, but left the edges of the ravine to show by their form that they had once been connected. For neither of these speculations, however, is there the smallest foundation in fact. What has to be accounted for, indeed, in regard to either of the great areas at present covered by water, is not so much the excavation of its sea-bed, as its segregation from an ocean originally universal by the boundaries that now enclose it; in other words, not so much the depression of the bottom of its basin as the elevation of its sides. Not only is the proportion of the land-surface of the globe to its water-surface scarcely more than one-third (being as 1 to 2.78), but the entire mass of the land which thus covers little more than one-fourth of the surface of the globe is quite insignificant in comparison with that of the water which covers the remaining three-fourths. For whilst the average elevation of the whole land is certainly less than one-fifth of a mile, giving from 9 to 10 millions of cubic miles as the total mass of land that rises above the sea-level, the average depth of the sea (so far as at present known) may be taken at about 2 miles, giving a total of nearly 290 millions of cubic miles of water, which is therefore about thirty times the mass of the land. From the computation of Keith Johnston, it appears that, "if we conceive an equalising line, which, passing around the globe, would leave a mass of the earth's crust above it, just sufficient to fill up the hollow which would be left below it, this line would then fall nearly a mile below the present level of the sea." This is tantamount to saying that, if the solid crust of the earth could be conceived to be smoothed down to one uniform level, its entire surface would be covered with water to the depth of about a mile. Hence it is obvious that as the elevation of that crust into land over certain areas must be accompanied by a corresponding depression of the sea-bed over other areas, such depression, augmenting in those areas the previous depth of the aqueous covering of the globe, would be quite sufficient to account for the existence of the great oceanic basins, without any excavating action. And a confirmation of this view is found in the fact, ascertained by recent soundings, that the deepest local depressions of the sea-bed are met with in the neighbourhood of islands that have been raised by volcanic agency. Further, as the quantity of solid matter that must have been removed (on Humboldt's hypothesis) in the excavation of the Atlantic valley must have been nearly four times as great as that which forms the whole known land of the globe, and as it is impossible to conceive of any mode in which such a mass can have been disposed of, we may dismiss that hypothesis as not only untenable in regard to the Atlantic basin, but

as equally inapplicable to any other valley of similar width and depth.¹

The general direction of geological opinion, indeed, has of late been, on physical grounds, towards the high antiquity of the great oceanic basins, not exactly as at present bounded, but as areas of depression having the same relation as they have now to the areas of elevation which form the great continents. Thus Sir Charles Lyell was strongly impressed by the fact that the mean depth of the sea is not improbably fifteen times as great as the mean height of the land; and that depressions of the sea-bottom to a depth of three miles or more extend over wide areas, whilst elevations of the land to similar height are confined to a few peaks and narrow ridges. Hence, he remarked, "while the effect of vertical movements equalling 1000 feet in both directions, upward and downward, is to cause a vast transposition of land and sea in those areas which are now continental, and adjoining to which there is much sea not exceeding 1000 feet in depth, movements of equal amount would have no tendency to produce a sensible alteration in the Atlantic or Pacific Oceans, or to cause the oceanic and continental areas to change places. Depressions of 1000 feet would submerge large areas of the existing land; but fifteen times as much movement would be required to convert such land into an ocean of average depth, or to cause an ocean three miles deep to replace any one of the existing continents."² And Professor Dana, who, more than any other geologist, has studied the structure of the existing continents and the succession of changes concerned in their elevation, has been led, by the consideration of the probable direction of the forces by which that elevation was effected, to conclude that the defining of the present continental and oceanic areas began with the commencement of the solidification of the earth's crust. "The continental areas are the areas of least contraction, and the oceanic basins those of the greatest, the former having earliest had a solid crust. After the continental part was thus stiffened, and rendered comparatively unyielding, the oceanic part went on cooling, solidifying, and contracting throughout; consequently, it became depressed, with the sides of the depression somewhat abrupt. The formation of the oceanic basins and continental areas was thus due to 'unequal radial contraction.'" In the opinion of Professor Dana, there has never been any essential change in the relations of these great features. "It is hardly possible," he says, "to conceive of any conditions of the contracting forces that should have allowed of the continents and oceans in after time changing places, or of oceans, as deep nearly as existing oceans, being made where are now the continental areas; although it is a necessary incident to the system of things that the continental plateaus should have varied greatly in their outline and outer limits, and perhaps thousands of feet in the depths of some portions of the overlying seas, and also that the oceans should have varied in the extent of their lands." . . . "The early defining, even in Archæan times, of the final features of North America, and the conformity to one system visibly marked out in every event through the whole history—in the positions of its outlines and the formations of its rocks, in the character of its oscillations, and the courses of the mountains from time to time raised—sustain the statement that the American continent is a regular growth. The same facts also make it evident that the oceanic areas between which the continent

¹ The case of such a shallow trough as that of the English Channel, of the former continuity of whose sides there is ample evidence, whilst its bottom is nowhere 500 feet beneath the surface, is obviously altogether different. The extraordinary depth of the Mediterranean basin, on the other hand, affords strong reason for regarding it as, like the Atlantic, a portion of the original area of depression, circumscribed by the elevation of its borders.

² *Principles of Geology*, 11th ed. vol. i. p. 269.



lies have been chief among the regions of the earth's crust that have used the pent-up force in the contracting sphere to carry forward the continental developments. If this was true of the North American continent, the same in principle was law for all continents."¹

Dimensions of the Atlantic.—The length of the Atlantic basin, considered as extending from the Arctic to the Antarctic circle, is nearly 8000 geographical miles. The nearest approach of its boundaries is between Greenland and Norway, whose coasts are only about 800 miles apart. They thence recede from each other towards the south, as far as the parallel of 30° N. lat., where, between the peninsula of Florida and the western coast of Morocco, there is an interval of 70° of longitude, or about 3600 geographical miles. The channel then rapidly narrows as it passes southward, so that between Cape St Roque in Brazil (5° S. lat.) and the coast of Sierra Leone (between 5° and 8° N. lat.) the African and American continents approach within 1500 miles of each other. The sudden eastward recession of the African coast as it approaches the equator, and the westward trend of the South American coast-line between Cape St Roque and Cape Horn, widen out the South Atlantic basin to the same breadth as that of the North Atlantic in the parallel of 30° N.—the interval between the Cape of Good Hope and the estuary of La Plata, in the parallel of 35° S., being no less than 73½° of longitude, or about 3600 geographical miles.

The depth of the North Atlantic has been more carefully and systematically examined than that of any other oceanic basin; and the general contours of its undulating sea-bed may now be regarded as pretty well determined. Putting aside the older soundings as utterly untrustworthy, and accepting only those taken by the modern methods, whose reliability has been amply tested by the accordance of diversified experiences, we can now assert with confidence that scarcely any portion of its floor has a depth exceeding 3000 fathoms, or about 3·4 miles, the greatest depth determined by the recent "Challenger" soundings, which was that of a limited depression about a hundred miles to the north of St Thomas, having been 3875 fathoms, or about 4·4 miles. Except in the neighbourhood of its coast-lines, and in certain shallower areas to be presently specified, the floor of the basin at its widest part seems to lie at a depth of from 2000 to 3000 fathoms, its slopes being extremely gradual. The central portion of the principal basin of the North Atlantic, however, is occupied by a plateau of irregular shape, of which a considerable part lies at a less depth than 2000 fathoms. Of this plateau the Azores may be regarded as the culmination; and that group being taken as its centre, it may be said to extend to the north as far as lat. 50°, and to the south-west as far as the tropic of Cancer. The northern extension of this plateau narrows out into a sort of isthmus, which connects it with the plateau that occupies a great part of the Atlantic basin to the north of 50° N. lat.; and it is across this isthmus, and along the bottom of the deep narrow valley on either side of it, that the telegraph cables are laid between Ireland and Newfoundland. Whether its south-western prolongation, known as the "Dolphin Rise" (fig. 1, *infra*) extends to the equator, so as to become continuous with the elevated area which culminates in St Paul's rocks, and by a further southward extension becomes continuous either with the volcanic elevation of St Helena and Ascension Island, or with the elevation in the middle of the South Atlantic which culminates in the island of Tristan da Cunha (fig. 2), has not yet been ascertained. According to the view already suggested as to the formation of the Atlantic basin, the plateau might

¹ "On some Results of the Earth's Contraction from Cooling," in *Amer. Journ. of Science*, June 1878.

be regarded as representing the original sea-bed (from which the Azores have been lifted up by volcanic action), whilst the deep valleys on either side of it are "areas of subsidence" answering to the "areas of elevation" of the land that borders them.

Generally speaking, the depths of these valleys increase pretty rapidly with the distance from the shore-line, so that the contour-lines of one and two miles follow the shore-lines pretty closely. But there are two localities in which shallow water extends to a much greater distance from land than it appears to do elsewhere. One of these lies in the neighbourhood of the British Isles. For a distance of about 230 miles to the westward of Ireland there is a slope of only about 6 feet in a mile; but in the next 20 miles there is a fall of 9000 feet, after which there is little change of level for 1200 miles. Hence as the depth of the sea immediately surrounding the British Isles is nowhere 100 fathoms (so that an elevation of their whole area to that amount would unite these islands not only to each other but also to the continent of Europe), it is obvious that the platform on which they rest is really, although now submerged, a part of the land-mass of Europe. Another of these extensive shallows is that of which the Banks of Newfoundland form the highest part; and of the existence of this a probable explanation may be found in the accumulation of the rock-masses that are brought down by icebergs every summer from the coasts of Greenland and Labrador. For it is now generally admitted that these icebergs are really parts of glaciers, that were originally formed on the mountain-slopes of Greenland and Labrador, and then descended valleys which open out on their coasts, so as, on arriving at the mouths of these valleys, to detach themselves and float away, being borne southwards by the Polar Current to be presently described. Most Arctic icebergs of which a near view can be obtained are observed to have upon them a considerable number of pieces of rock, sometimes of a very considerable size; and these are of course deposited on the sea-bed when the icebergs melt (which they usually do on the borders of the Gulf Stream), thus forming a vast conglomerate bed, to which parallels are not improbably to be found in various geological epochs.

Geological Age of the Atlantic Basin.—Guided by the principle that great oceanic basins are to be considered rather as original marine areas that have been limited by the elevation of their boundaries, than as having been formed by the excavation of terrestrial areas, we have to inquire what evidence there is that the basin of the Atlantic has undergone any considerable change within a comparatively recent period.

As has been pointed out by Prof. Wyville Thomson (*Depths of the Sea*, p. 473), it is difficult to show that any oscillations have occurred in the north of Europe since the termination of the Secondary period, to a greater extent than from 4000 to 5000 feet,—this being the extreme vertical depth between the base of the Tertiaries and the highest point at which Tertiary or post-Tertiary shells are found on the slopes and ridges of mountains. Such oscillations, while considerably modifying the boundaries of the Atlantic, would not seriously affect the condition of the deeper parts of its sea-bed; and hence it may be concluded that the two deep valleys, one on the European side of the modern volcanic platform of the Azores, and the other on the American, each having a width of 600 or 700 miles, and an average depth of 15,000 feet, could neither have been formed by such oscillations, nor could, when once formed, have been converted into dry land. It will be presently shown that this idea of the existence of an Atlantic basin corresponding generally to that now existing, as far back as the later Secondary period is strongly supported by the evidence