

Introduction to Catalogue of the Pleistocene Mammalia in the Taunton Museum.

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I.

THE fact, that man has inhabited the earth for a far longer period than the short 6,000 years, which till recently has been supposed to be the past term of his existence, being now firmly established; it is a matter of great interest to every English student not only of geology but of the early history of our race, to know what was the state of this country at the time when the earliest traces of man occur, as far as at present known; and among the evidences of that state, the remains of the Mammalia which are found to co-exist with these early remains are not the least important. A subject, which

embraces so great a variety of detail, can only be treated in a paper like this as a summary, and that not of the experience of a single individual, but of the information which has been accumulated by the labours of others for many years. The amount of new matter I can hope to introduce is very small, I may perhaps give a different coloring to the subject, my inductions may not be precisely the same as those of others, but it is only by comparing the opinions, or what amounts to the same thing among those who simply seek for the truth, the experience of workers at a study of this kind, that a true idea of it, or one approaching to the truth can be formed.

Somersetshire is exceedingly rich in the Mammalian remains of this epoch, and thanks to the two energetic collectors of the Mendip, who years ago, when Dr. Buckland was first calling the attention of learned men to the importance of these remains, ransacked the caves of their native hills, and religiously preserved the bones they found therein, our Society has become possessed by the purchase of their collections, of perhaps the most important local collection of Cave Mammalia in existence.

I shall in this introduction do little more than enumerate the animals that are now known to have inhabited England since the first or great glacial submergence, or the period of the boulder clay, and as far as I can see at present, previous to a second cold period of very considerable, though of far less intensity than the first, which was also in the south of England at least, a period of submergence to the extent of perhaps fifty feet or somewhat less. This period would perhaps correspond with the interglacial period of Professor Heer and others, of which clear evidence has been adduced in connexion with ancient glacial phenomena in Switzerland.

I shall omit from the enumeration the Marine Mammalia, of which the evidence is very slight and uncertain, and also all the bats but two, for their remains, though very numerous in the caves, require far more close examination than has been yet given to them to distinguish the various species.

II.

I shall divide these animals into six lists.

- 1.—Those that still exist in these islands.
- 2.—Those that do not exist in Britain, but still are found in Europe.
- 3.—Those that do not exist in Europe, but have their head quarters in Asia.
- 4.—Those that have their head quarters in Africa.
- 5.—Those that are confined to North America.
- 6.—Extinct animals.

And to these I shall add an enumeration of those that now exist in Britain wild, but are not found in the older caves. For although nearly all caves contain bones, and many are perfectly full of them, it is only those, which by direct or collateral evidence, have been shewn to have been filled in the period above alluded to, and the river and other deposits of the same date, that I shall take any notice of in this paper.

The first thing that strikes a student of these remains, is, that so large a proportion of animals still wild in Britain should be found in these deposits. There are at present in the British Isles, excluding as before stated the Marine Mammalia and all but two of the bats, thirty-three species of wild Mammalia.

There are found in the cave and river deposits of this period, the noctule or great bat, the greater horse-shoe bat, our two more common shrew mice, the mole, the

badger, one and perhaps both our native forms of marten,* the polecat,* the stoat or ermine, the otter, the fox, the wild cat, the stag, and the roe, one hare, the rabbit, all our three voles or short tailed beaver-like rodents, one of our common mice, probably *mus sylvestris*, and doubtfully our other shrew, and one other species of hare, and still more doubtfully the wild ox of some of the parks of the North of England and Scotland. Thus, certainly twenty-one, and possibly twenty-four of the forms now living in Britain are identical with those whose remains are found in the deposits of this period. Of the above, the shrew mice, the mole, one marten, and the mouse, and the two doubtful animals, the other shrew, and the second species of hare, have not been recognised in the Somerset deposits of this age.

The next group is that which is no longer found wild in the British Isles, but which still exists in Europe. It contains the brown bear, the glutton, the wolf, the lynx, the elk, the reindeer, the auroch, the wild boar, the common lemming, and the allied *Myodes torquatus* of Northern Russia, the citellus marmot, and I have recently recognised a fourth vole, smaller than our water rat, which appears to be identical with the Swedish *arvicola medius* of Sundevall, among bones from Wookey hyæna den, and the beaver. Of these the lynx, the elk, the common lemming, and the beaver have not been as yet recognised in Somerset. The reindeer presents considerable variation, but the forms appear to merge one into the other, and all into existing varieties of the ordinary *Cervus tarandus*. I

* The *Mustela foina* or beech marten has occurred in a cave in Wales, but it was in such a situation that it might have been introduced subsequently to the Elephants and other bones found in the same cave, among which were polecat bones. (Falconer, Proc. Geol. Soc., 1860, p. 488.)

shall hereafter refer to the oxen of this epoch, as in some sense, they are probably represented by tame, though not wild animals in this section. It will be observed that none of these European animals are at present found to the south of the Alps and Pyrenees, except the large carnivora, and the wild boar. These, however, have always a larger range in latitude than the more exclusively herbivorous animals, and the impress of the whole group rather indicates a cold than a warm climate, though with the exception of the reindeer and the lemmings, not a severe one. We may also remark that the dates of the extinction of the British bear, wolf, wild boar, and beaver, are pretty well made out, so that they rather belong to the first than the second class.

We will now turn to the group which is peculiar to Asia, or is rather found still wild in that continent. The small tailless hare or pika of Kent's Hole is probably identical with one of the Siberian species, the Siberian *spermophilus erythrogenys* cannot be differentiated from the animal whose jaws in the Taunton collection Dr. Falconer named "*erythrogonoides*," and the *spermophilus superciliosus*, of the same country, has been discovered in considerable numbers rolled up for their last winter's sleep in a brick earth at Fisherton, in Wiltshire, by Dr. Blackmore, to whom we are indebted for the discovery of lemmings in the same locality, and for the recognition of the White Sea lemming or *Myodes torquatus* in Mr. Wickham Flower's collection from Wookey hyæna den. Several forms of horse inhabit the high region to the east of Affghanistan, the Pamir Step, and the Karakorum Chain, the upper parts of the basins of the Jartaxes and Oxus; the kiang is found on the more easterly mountains of Thibet, and there appear to be herds of really wild true

horses in the more elevated parts of the country to the north of the Tian Shan Chain, between Kokand and the country of the Buruts, about the river Ili. It appears from the accounts of travellers in these regions that the horses with short ears and bushy tails inhabit the more rugged and hilly regions, while the long eared forms or wild asses affect the plains. The information we have on these points is rather confused and to a certain extent conflicting.* I have compared some fossil teeth from French caves, and found them closely to resemble those of the kiang, while most of the English specimens are hardly to be distinguished from the common horse. One, or possibly more forms furnish more fossil specimens than any other animals. They must have been abundant in the extreme during the period we treat of. There is some slight reason to believe that in Europe, and even in Britain, horses were really wild since the commencement of the historical period,† so that these fossils may possibly be relegated to our second, if not our first group. The whole of these Asian animals indicate an extreme climate, that is, cold, very cold in winter, but hot in summer, such as is now experienced in Central Asia.

We next turn to the small group, found in our caves, of which Africa is at present the head quarters, that is, the bones found in our caves cannot be differentiated from those of certain African animals.

Then all belong to one genus, the cat. They are the lion, the panther, and a species I have recently recognised, the *Felis caffer*. It was formerly supposed that the large

* A valuable paper on the distribution and breeds or forms of true wild horses, is given by Lieut. Col. Smith, as the Introduction to the Natural History of the Equidæ, Naturalists' Library, Vol. xii., 1841.

† See the paper by Col. Smith, quoted above.

feline of our caves was a species distinct from any now living, but a very minute examination of these remains has convinced Mr. Boyd Dawkins and myself, that a large proportion of them is absolutely indistinguishable from the bones of the average modern lion, and that there is a complete series of specimens connecting these with the largest cave *feles*, and that the two forms, hitherto considered distinct, are identical; we also find that many of the distinctions which were relied on by the first describers of the animal as distinguishing it from lion and tiger, are variable in all the three forms; while others, the most important of which were first pointed out by Professor Owen, in 1834, are perfectly constant, and therefore distinguish this animal from tiger, and identify it with lion. It certainly grew to a larger size, and was more powerful in its limbs than any recent lion we have met with, but this no more constitutes a specific difference, than the limbs of a London dray horse, separate it specifically from the Arab. The existing lion is found throughout Africa, and south western Asia; its northern and eastern boundaries, are the south slope of the Taurus, and southern Persia, M. Vambery appears to have expected them in Mazenderan, but he only found tigers there. I am also informed by a gentleman well acquainted with Persia, that he never heard of lions on the Caspian. They appear to spread through southern Turkistan and Affghanistan to the Paropamisus, and, I believe, but am not certain, that they are found in the upper part of the basins of the Jartaxes and Oxus, but they do not occur in the lists of animals from Kokand or Northern Bokara, or Khiva. They are also found in the lower part of the valley of the Indus and some other parts of eastern India. Within the historic period lions remarkable for their large size, were found in Thessaly,

may not these have been the descendants of the magnificent European breed of the period we write of? It is remarkable that where the lion ends the tiger begins, the latter animal is found to above 50° N. latitude in Siberia, and on the Amour, to the north of China. But the lion, in a thinly peopled country, with abundance of antelopes and wild asses as food, does not appear to pass a limit formed eastward by a mountain chain, and northward, by simply the territory of the tiger. It would appear therefore, that either the tiger were the stronger animal of the two, or that the lion was incapable of bearing the severe winter of Tartary.

The next African animal is the panther. This appears to have much the same range as the lion, it appears however, to be more hardy, as it occurs, though rarely, in the Caucasus, where the lion is never found. It extends further to the eastward than the lion in India, but I have seen some skulls from Eastern India and Malacca which appear to indicate a distinct and representative species, analogous in many respects to the tiger, as the western panther is to the lion. A considerable confusion has been caused by some naturalists, who have considered the ounce of Central Asia, a large felis with a pale grey coat spotted with black, as the young of the panther. This, both as regards the skin and the skull is a very distinct form, perhaps more so than any other of the same size, and this renders the accounts of panther in Central Asia very unreliable, consequently we cannot find the limits of the panther in this direction. The remains of this animal are rare in the British deposits of this period, and are as far as I know confined to the Somerset caves; teeth of a species of nearly similar size are found in an older deposit in Norfolk, but there appear to be points of difference

between it and the true panther, but under the name of *Felis antiqua* the species has been described from the Belgian, French, and Spanish caves.

A large species of wild cat has been several times figured from the Belgian and French caves, and also from Kent's Hole near Torquay, and it has been hitherto considered as a simple variety of the wild cat of Europe. A jaw, however, having the same dimensions as these fossils exists in the Taunton Museum which differs essentially in its characters from that of the wild cat and agrees in every particular with the *Felis Caffer* of Africa, and as far as I have as yet been able to examine, with no other species. I have also found one or two other bones of the skeleton which point in the same direction, consequently I consider that there is good *primâ facie* evidence of the existence of this species in our post glacial deposits.

The range of this animal extends over the whole of Africa, and it is represented by closely allied species throughout Asia, with some of them I have been able to compare the bones in question and they do not agree, but of others, which appear to be more closely allied to *Felis Caffer*, I have only seen the skins, consequently the exact identification of the species must at present remain sub judice.

The present limitation of this group certainly does not point to a cold climate, as that prevailing when it inhabited England.

I now turn to a group which at present inhabits Polar America, and that part of the world alone. It consists of but two animals, the musk ox, or more properly musk sheep, and the Arctic fox. Both animals are of extreme rarity in our deposits, and the musk sheep has not

occurred in the caves. It was clearly a cotemporary of the mammoth in North America and Siberia, for their remains have been frequently found intermingled in the frozen soil on the north coast of both continents, particularly at Escholtz Bay in North America, where the musk sheep has been found of extraordinary size. This animal has been found in this county in the river deposits near Bath, by Mr. Moore. The Arctic fox has been found only twice as yet, but being a small animal, and the teeth resembling those of a small fox, the slight peculiarities, which with the exception of size, differentiate the bones might probably have been overlooked. The only remains of this animal that I have identified are two bones which I found in Wookey hyæna den, in a part of the cave which did not contain any other bones than those of the reindeer, wolf, lemming, the Swedish vole, hare, and only one or two teeth of hyæna, and one or two other small animals, and which appears to have been filled somewhat more recently than the part which contains the great extinct animals, and the more usual cave fauna, and Mr. Boyd Dawkins has found other remains from a cave in Pleasley Vale. One other animal has been recently recognised by Professor Busk in several caves, in fact it appears to be abundant, it is also American, but hardly Arctic and certainly not Polar in its habitat, it is the *Ursus ferox* or great bear of North America. It appears to have been previously described as *Ursus priscus* by Baron Cuvier and Professor Owen, but Professor Busk finds no essential difference between it and the American animal. The musk sheep and Arctic fox never penetrate at present below the latitude of the St. Lawrence, and in fact the musk sheep is confined even in the severest winters to a much higher latitude. The presence of these two

animals, however, in this country indicates a climate at least as severe as that of the colder parts of Canada, and also in consequence of the migratory habits of the animals it indicates that while they lived here, there was a land communication with a country, of a far more rigorous climate in which they could have existed during the summer.

I have not included in the foregoing lists two animals, the *Hyæna spelæa*, and the gigantic *Bos primigaius*, I have but little doubt that the latter is represented by some of its descendants, more or less hybridised by the tame cattle which some migratory tribes of man probably introduced into Europe long after the period we speak of, but still long anterior to historic times. It is therefore somewhat difficult to class this animal with any of the foregoing. With regard to the hyæna, my friend Mr. Boyd Dawkins would consider it simply a variety of the *Hyæna crocuta* of the Cape; I have examined and compared some skulls of both animals and I think the differences which I have made out between them are constant, if so, it will claim rank as a northern representative of the southern *crocuta*, but still a distinct species. This animal was exceedingly abundant in Somerset, and we can exhibit nearly complete skeletons in our collection.

The remaining group are the extinct animals, it is much smaller than is usually supposed, and may be sub-divided into two well marked sub-groups, those having a northern and those a southern distribution as fossils.

The whole of these animals were of very large size, and we observe that, in any country which has been inhabited by only savage men, when civilised man makes his appearance, the larger animals are the first to disappear, so it is probable that when man, weapon armed man, although savage, made his appearance here, the largest and most

powerful animals, which till then had held the upper hand, were the first to suffer; while the more agile and smaller retained there ground. The northern group consists of but two animals, the mammoth and the *Rhinoceros tichorhinus*: they are found to accompany each other over the whole of northern Asia and Europe, and their entire carcasses are not uncommon, with flesh and skin preserved in the frozen gravel of Siberia. These indicate the prevalence during their sojourn here of a rigorous climate, though not necessarily very excessive; like other arctic animals they were probably migratory, and their food is known to have in some cases been the pines which still exist in Siberia. Remains of two or more of the rhinoceros were dug up under the site of the County Prison, at Taunton, surrounded by masses of vegetation of the same species as now flourish on the banks of the same stream which probably swamped them. Almost as numerous as the remains of the mammoth, are those of another elephant of much larger size, the *Elephas antiquus*. This from the remains at Taunton is known to have reached the height of fifteen feet, and this is frequently accompanied by a second rhinoceros, the *Rhinoceros leptorhinus*. Both these animals are of decidedly southern distribution, the two species of rhinoceros seldom occurring in the same place, though the two elephants do. This would rather point to the fact that the climate varied considerably, and that at one time it was fit for the northern, and at another for the southern group. It would appear that the northern or mammoth group lasted later in this country than the southern, and the presence of the Arctic fox in a deposit, which appears to be slightly newer than that which contains the mammoth in Wookey hyæna den, would seem to shew that the close of the mammoth period was colder than the principal portion of it. To this southern

group belongs the great hippopotamus. This was, though not abundant, at least a general inhabitant of this country during a portion of this period. If it was not migratory it must have had open water in the rivers throughout the year; and as it is found far inland, and far from any marine deposits of this age, it does not, as has been supposed, appear to have been a marine species. The residence of this animal throughout the year would indicate a climate not colder than the south of France during its sojourn.

The great Irish elk appears to have had its head quarters in these islands, particularly in Ireland; its remains are not very abundant in Somerset.

The great cave bear was an animal of vast power, its remains are universal in the older European caves, it has been divided into several species, and a second species of bear has been founded on some smaller bones, but we find that the variations of the individuals of both recent and fossil species are so extensive that an entire revision of the osteological characters of the whole group is necessary before we can pronounce with certainty on the value of characters which have been assumed to be specific.

The remaining extinct animal has been found in Kent's Hole in Devon alone, it is the *Machairodus latidens*, an extraordinary sabre toothed feline of which only some of the teeth are known; allied animals, however, from France, Germany, and South America have thrown some light on its structure, but still too little of it is known to pronounce with confidence on its nature and habits, some of the bones from America seem to indicate great swimming powers, it may have been a water tiger.

Of the above animals the *Machairodus* and *Hippopotamus* have not to my knowledge occurred in this county, but the *Hippopotamus* has been found at Bristol, on the opposite side of the Avon, and also in Devon and Wales.

The animals of which we have to observe the absence ; we may remark, that up to the present, no species of sheep, goat, or antelope, except the ovibos, has been discovered in the more ancient deposits, though a species of goat has been found both in this county and in Yorkshire, in caves which are probably of the oldest pre-historic date. No trace of chamois, bouquetin, argali, mouflon, saiga, or *Antilope gutturosa* occurs, though these animals, all of them of considerable size, are now spread over tracts which are still inhabited by other animals which are found in the deposits we treat of. It is difficult to account for their absence, except by that strange, and at present somewhat mysterious law, which appears to bind certain closely related species of animals to particular parallels of longitude, which they appear never to pass, and of which some most extraordinary instances are related as occurring in Central Asia, by M. Vadikof. The only British wild animals that are missing, are all of small size and might hitherto have been overlooked, except two, the date of whose introduction is pretty well known, our black and common rats. The others are the hedgehog, perhaps one shrew, the squirrel, the dormouse, our house-mouse, and harvest-mouse, perhaps one or two forms of hare, and the little weasel. The arboreal habits of some of these, is an excellent reason why they should not occur in a fossil state. The others, or some of them will probably occur at no distant date.

III.

The principal fact then, which is proved by this examination of the cave fauna, is, its eminently European character. Of forty-four animals which are found in the caves, and other deposits of the period we treat of, twenty-one are British, and thirty-four and perhaps thirty-five are European ; and if the doubtful species are included, the

fossil animals will be forty-seven, of which twenty-four will be British, and thirty-seven or perhaps thirty-eight European ; three or perhaps four are exclusively Asiatic ; three have their head quarters in Africa ; and three are American ; while only ten and perhaps eleven are certainly extinct ; and two others may probably be reckoned in the same category. Some modification may perhaps be expected in some of the above determinations, particularly as regards the wolf, the fox, the bear, the wild boar, and the oxen, and perhaps also the deer. I do not believe that the *Elephas meridionalis*, or great Italian elephant, has occurred in this country in the deposits we speak of, or with the remains of man, and in the same category we must place *Rhinoceros megarhinus*, though both existed in this country previous to the glacial submergence, and have been elsewhere found accompanied by traces of the human race.

The inferences which I draw of the nature of the climate from the distribution, both past and present of these remains, is, as may be seen, somewhat different from that which has been most generally supposed. The occurrence of the Polar and Arctic mammalia in these deposits has been held to indicate a very severe climate gradually moderating from the period of intense glaciation to the present. From the analysis I have sketched out, it would appear that the strictly Polar animals were of the greatest rarity, and that they belong to migratory species, and the same may be said of the more Arctic forms, excepting that the reindeer was undoubtedly common. I have shewn also, that the great majority of the animals are of strictly mid European types, and they were accompanied by others, both of extinct and recent forms which have a southern rather than a northern distribution, and that one of these, unless it was migratory, and it was ill-fitted for migration,

must have required open water throughout the year, during its sojourn ; and that there is good evidence that the vegetation of this period was, in the Vale of Taunton, at least, identical with that now prevailing ; that in extreme North America a more abundant shrubby vegetation there existed, than now prevails. And lastly, that the reindeer became more abundant towards the close of the period when the larger animals became rare and disappeared, and that, in one instance at least, of the occurrence of the Arctic fox, there is reason to suppose that it was somewhat posterior in time to the elephant and rhinoceros found in the same cave. So that in place of a climate gradually moderating from a period of intense glaciation, we have rather evidence of a climate for the most part that of mid Europe, with a still warmer temperature during a portion of the period, which however terminated by a second lowering of the temperature, so that that the climate of France became fit for the reindeer, to the exclusion of most of the other large herbivora. The man of this reindeer period was probably in a state of civilization, but little inferior to that of the Esquimaux, and recent discoveries in Kent's Hole seem, though rather doubtfully, to shew that the men of the still earlier mammoth period possessed the art of making implements of bone and stone not inferior to that people.

Owing to unavoidable circumstances the publication of the first part of the Catalogue is postponed till the issue of the next Volume.
