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Mr GRAY, President, in the Chair.

ON THE REMAINS OF THE DOG, PREHISTORIC, ROMAN,
AND MEDÆVAL, FOUND NEAR CAMBRIDGE.

By Professor T. MCKENNY HUGHES.

It has been noticed that almost all animals that have been thoroughly domesticated are gregarious, and it has been suggested that they only transfer their allegiance from the leader of the herd to man. However that may be, it is certain that the animals most like dogs and those from which, considering all the circumstances and probabilities, dogs most commonly appear to have been derived, are gregarious, and that dogs which have returned to a feral state are apt to become gregarious, so far at any rate as to hunt in packs, as do wolves and jackals. We should expect therefore to find that dogs were domesticated in very early times, and as far back as pictorial illustration and history carry us, we do find that the more highly civilized peoples had many breeds of dogs. Several of the more marked varieties existing at the present day were represented on the monuments of ancient Egypt. The Romans knew and imported the powerful dogs of Britain.

Among primæval races, however, or peoples of a lower civilization, selection of breeds does not appear to have been practised to any great extent and therefore the characters of the wild animal from which the dogs were derived continued to prevail.

Thus we find that the dogs of North America resemble the great grey wolf of Arctic regions, while some of the smaller North-American-Indian dogs resemble the prairie wolf (*C. latrans*). The central European and Indian dogs are like the wolves of their own country, while in those more southern

regions, where the jackal takes the place of the wolf, the native dogs are of the jackal type.

We must remember that although there may not have been much selection of breeds among primæval peoples, still the tribal isolation which eventually affected the racial characters of man may well have perpetuated any variety which appeared among his domestic animals, and it may be that dolichocephalic and brachycephalic dogs may help us by and by to trace the migrations of his masters.

Although there may have been no attempts to arrive at a number of fancy breeds, still the rudest people who made use of dogs would endeavour to procure such as were best adapted for their purpose. The Esquimaux wanted a powerful dog for hunting and for draught; the Hungarian shepherd a dog that could fight a wolf—and so on.

Even where there may have been many different breeds introduced from time to time, if there were no isolation and selection, a common type would be arrived at by the crossing of various kinds and the absorption of any newly introduced variety into the common stock which was numerically the strongest and had nearly reverted to an original more stable form.

A common ancestor of the race is seen in the Tertiary *Cuon Cynodon* and *Cynictis*¹ which really do not differ so much as might have been expected from the form to which the common dog reverts when breeding is unchecked by selection.

We have a good example of this in Constantinople, where the dogs roam about unowned and unrestrained, living on the street refuse, and, therefore, protected as scavengers. In eastern and southern towns the climate facilitates this and people are more tolerant of animals quartered on the whole community in this manner. Even in Florence the cloisters of S. Lorenzo furnish a home to an immense number of cats, to which as a sort of charity food is regularly given at noon.

In Constantinople where I was looking out for any varieties that might appear I found a most remarkable uniformity of

¹ H. Filhol, *Recherches sur les Phosphorites du Quercy*, Paris, 1876, 8°.

type. The resultant breed is a small yellow mastiff with a more tapering muzzle and a more close approach to the form of a wolf than is seen in our English breed. There is a smaller grey breed, with a still sharper nose and longer pointed ears, which is more like the jackal and may be a later introduced breed not yet absorbed. When we remember the numerous southern lands dependent upon or at any rate in close touch with Constantinople it would be curious if the jackal, the essentially southern type, had left no mark on the breed of dogs.

Dogs are mentioned in the Bible not so much as the faithful friends of man but as despised and often dangerous animals that showed their teeth and ran about the city and yet were tolerated as useful for certain purposes.

The references to them in Latin writers are of the same kind, and the word was applied to man as a term of abuse as is the word *cur* among us, or, in milder forms of depreciation, as *dog-Latin*, *dog-rose*.

We cannot in any English town now see what would be the result of unselected breeding. Almost everyone who keeps a dog has chosen it for some definite object, but only to a small extent does this seem to have been the case in Egypt, Greece or Rome, and there remained the great majority of unowned dogs that obtruded themselves upon the public notice everywhere. Judging from the bones of dogs found in our ancient ditches and lay-stalls, we should infer that the same sort of thing prevailed in English towns in mediæval times. The great majority of skulls found belong to the type of dog now seen in Constantinople. At Chesterford, the most distinctively Roman town we have in this district, we find that this same type is by far the most common. There is associated with it a smaller breed with what the French would call a 'front bombée,' a fuller brow and orbits set more forward, and thus in one important character differing more than does the other breed from the wolf, in which the eyes are set more obliquely, that is, drawn out along, rather than across the head.

From the cast¹ of the lower jaw of a dog recently dug up in

¹ Now in the Woodwardian Museum.

the Forum in Rome we should infer that the common breed which was uncared for and left unburied was of the same normal type from which dogs descended and to which they revert.

Carrying our enquiries still further back into pre-Roman times, we must admit that it is not always easy to fix the exact age of the bones found in the fens.

Remains of dogs of all ages and of various breeds are dug up along the banks of the rivers, but it is of course not sufficient that a dog's skull has been procured from peat or river silt. We must be sure that it is not a modern specimen covered up in the marginal deposits of the existing stream. We must satisfy ourselves that it is out of peat or silt far from where the stream has run in recent times.

If we reject all examples in which the bones are not thoroughly stained and so get rid of all those specimens which belong to the more recent river deposits, and have regard also to the associated remains, we may often satisfy ourselves on this point sufficiently for our present purpose.

Our next difficulty is to distinguish between wolf and dog. In those early times the dog had not been so far modified as to offer any very marked difference of structure as compared with the wolf. The strength and prominence of the parietal ridge is generally regarded as a test, as this bone, being a protection to the brain cavity, is developed in the wild beast and lost by degrees in the domesticated form. It moreover is an indication of the strength of the great muscles which, passing through the zygomatic arch, move the lower jaw, and these again might be expected to be more developed in the wolf than in his descendant, which had softer food.

These points of difference would naturally be less marked in a breed of dogs but recently reclaimed from the wolf, still existing under not very dissimilar conditions, and, moreover, not infrequently crossed with the wolf. This is conspicuously the case with the Esquimaux dogs, which, as Sir John Richardson has pointed out, are often undistinguishable from wolves in general appearance, and accordingly in the skull of the Esquimaux dog, as may be seen in the specimen in the Wood-

wardian Museum, the parietal ridge and zygomatic arch are strongly developed. Therefore, although the lower ridge and weakly developed arch may be considered as generally distinctive of dogs, we cannot infer from a strong ridge and largely developed arch that the animal was a wolf.

The dog or wolf of the fens belongs to what I have called the normal type, but there is less difference between what is called a wolf and what is called a dog than there is between the fen wolf and the Esquimaux dog. The fen wolf approaches the dog type, and the fen dog approaches the wolf type. It may be that the wolves are only the poor degenerate remnant of a dying-out race; or it may be that we have not procured any wolves at all from the fens. At any rate I know of no criteria by which the fen wolf and fen dog can be distinguished.

In the peat of the fens we have also some smaller dogs of the same character as those found at Chesterford, and perhaps of the same age. From the researches of Studer¹, we should be led to expect that we may find a considerable variety of breeds among the pre-Roman inhabitants of this country. At any rate it is quite clear that the remains of domestic animals found associated with man should be carefully preserved and the nature of the association carefully recorded.

[Specimens or figures of the various types referred to were exhibited at the meeting.]

Professor HUGHES, secondly, read a paper

ON ANCIENT HORSE-SHOES.

The history of horse-shoes is of considerable importance in archæology. They are continually being dug up and it would help us greatly if we could assign a date to the various forms which occur. They are said to have been found in this district associated with the remains of Roman, Saxon, Norman, and every later age; but it is very difficult to obtain any satisfactory

¹ Dr Th. Studer, 'Die prae-historischen Hunde in ihrer Beziehung zu den gegenwärtig lebenden Rassen.' (*Abhandl. d. Schweiz. Paläontologischen Gesellschaft*, Vol. xxvii.) 1901, p. 1.

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