

## The Mammals of the Prehistoric Caves.

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In order to gain a clear conception of the meaning of the animals found along with human tools in the pleistocene caves of Britain it is necessary to consider the changes of climate which our country, in common with Western Europe, underwent since man's appearance.

A convenient starting point is the Weybourne Crag of East Anglia, which contains cold water marine shells, indicating a more severe climate than that of the present day.

The marine deposit is immediately succeeded by the "Forest Bed," which is, as its name implies, full of plants which now live in a climate slightly, perhaps 4°c, higher than that in the same district now.

With these plants occur two elephants, the *elephas meridionalis* and a mammoth ancestor, a little rhinoceros of the Sumatran type, the living hippopotamus, many great extinct deer, bears, "sabre-toothed tigers," the giant beaver and a tortoise. The next younger fauna is that formed in the high terrace of the Thames valley, where about 100 feet above the river level are found the giant beaver, and some other forms linking it with the forest bed, together with implements of Chellian and Acheulian types. This is the first certain occurrence of man in Britain. In the middle terrace, which is next in age, Mousterian flint implements are found with *elephas antiquus*, the straight-tusked elephant, and Merck's rhinoceros. These animals are southern forms, found in northern Italy through a great part of the Ice Age.

The bottom terrace at Crayford yields the mammoth, woolly rhinoceros and musk ox, which are cold region animals, and by their presence indicate a drop in temperature.

Still lower, at Chatham, the straight-tusked elephant reappears, suggesting a return of a warm climate.

In Switzerland there is evidence of four independent extensions of glaciers, each representing an Ice Age separated by "interglacial" warmer periods.

Nothing in England, except this bed at Chatham, countenances the presence of more than one real glacial period in Britain.

In a bone cave at Cresswell Crags in the very lowest deposits the straight-tusked elephant and hippopotamus are found mixed up with very rough ironstone and chert implements which appear to be of the Chellian Age. Thus, here we have evidence of the first warm fauna, that of the High Terrace of the Thames.

In the succeeding beds of Cresswell the fauna is a cold one, with mammoth, woolly rhinoceros and reindeer, and the implements are of Solutré Magdalenian types. Thus from this cave is missing all trace of Acheulian, Mousterian and Aurignacian men. Nowhere, in fact, north of a line between the Wash and South Wales is there any trace of men of these periods, and there is definite evidence in the Victoria Cave, Settle, and in Cefn Cave in North Wales that a great extension of ice covered the north after the old warm fauna lived and left its bones in these caves.

When we come to the south we find in Kent's Hole typical Mousterian implements and others of Acheulian type, but perhaps of Mousterian age with the cold climate mammoth. In Paviland, in the Gower Peninsula, we have Aurignacian plants, and worked bones. The obvious explanation of these parts is that the great extension of the ice period of maximum cold fell in Mousterian and Aurignacian time, the country in the north being in part covered with ice and in part suffering from so inclement a climate as to be unattractive to man.

Mousterian man entered Britain with the cold climate and belongs to the very primitive but highly specialised type known as Neanderthal man. The men who made all the later types of implements were of modern type, they would pass unnoticed in a London crowd.

It thus appears that the important division between the ancient and modern Stone Age cultures lies at the end of Mousterian time.

There is no evidence of a great time interval between the Magdalenian culture and the beginning of the neolithic period, the pygmy flints of the late paleolithic pass on into the pygmy flints of early neolithic time. The great retreat of the ice had proceeded far enough in Magdalenian times to allow of man living in Derbyshire, and we have in that county a Windy Knoll, a representative of the last pleistocene fauna, with no elephant and rhinoceros, but with bison and reindeer, arctic fox, wolves

and bears. This fauna may indicate a climate somewhat colder than that of the present day, but leads on directly to it, reindeer having lived on in Caithness and Orkney, perhaps till the twelfth century, A.D.

Evidence from the "seasonal clays" of southern Sweden suggests that the end of the great ice age may have been only 6,000 years ago, and this time 4,000 B.C. may be about the date of the Magdalenian period in Britain. There is some archaeological evidence, the common occurrence of steatopygous figures, for example, which suggests a connection of Predynastic man and Egypt with late paleolithic man in south France. It is generally believed that dynastic time in Egypt began about 3,500 B.C., the pre-dynastic culture going back for a thousand years more. This date agrees well enough with the geological evidence for the end of the ice age.

Amongst the problems which the University of Bristol Speleological Society can help to solve are the succession of culture in pre-historic Britain and the correlation of these culture stages with climate and fauna. We know little of the ages of the animals found in the Mendip caves. We do not know, for example, why lions, very rare elsewhere in Britain, should have been so abundant in Sandford and Bleadon caves.

The work of Messrs. Kennard and Hinton has shown that the small rodents and land shells may afford much important evidence in age and climate. These animals are, however, quite unrepresented in the existing cave collections, and present a most interesting field of study.

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