

We are all too familiar today with the spectacle of animal species exterminated or brought perilously near extinction by the careless greed of mankind. During the last 50 or 100 years this process has accelerated in a horrifying manner, but there is nothing really new in it: it probably began some time between 40,000 and 100,000 years ago.

This was the time during which the last warm or interglacial phase of the Ice Age ended and the last advance of the ice (known as the Würm glaciation) began. The ice retreated again about 10,000 years ago and now we are probably living in another interglacial phase. During the later part of the last inter-glacial the first real men appeared - the Neanderthal men - who were not very different from modern man. The earliest evidence of people like ourselves, true *Homo sapiens*, is from about 40,000 years ago, within the Würm glacial phase. All this applies to the Old World, Eurasia, and Africa; man probably migrated to America from northern Asia at some time quite late in the last glacial phase, but certainly before the end of it.

There is good reason to believe that man has been a hunter throughout his evolutionary history, but he was probably not numerous or skillful enough to be a real menace to other animal species until

he had evolved up to the Neanderthal and *sapiens* stages. This is the view that I shall take, and I will go on to describe some of the large extinct beasts which we know were associated with the men of the late Palaeolithic or Old Stone Age, and to whose extinction he probably contributed by his ruthless and efficient hunting.

Elephants

Four kinds of elephants, in addition to the two species which have survived, are known to have lived in the Stone Age. The best known of these is the woolly mammoth (*Mammuthus primigenius*). This was an elephant of no great size, smaller on average than the Indian elephant. Our quite extensive knowledge of it is based on abundant bones and tusks, some frozen carcasses, and a number of vivid cave drawings and engravings made by the Cromagnon men about 30,000 years ago.

The woolly mammoth was a beast of the cold tundra, which, of course, extended much farther south than it does today. The skin was thick with 3½ inches of subcutaneous fat and covered with a soft, dense undercoat of wool and an outer coat of long, coarse hair. The head was domed to accommodate large nasal sinuses and behind it, on the shoulders, there was a hump of stored fat. All these

were features which enabled it to live on the cold desert of the tundra. The tusks were much larger than those of existing elephants, the record fossil tusk being over 16 feet along the curve. They curved outwards near the base and then inwards, so that the tips sometimes met and even crossed. In this condition the tusks could not have been much use as weapons, but it is likely that they only reached this state in old bulls, which were already past fighting or breeding.

The woolly mammoth lived in northern North America as well as in Europe and Asia. In the Old World it probably died out about 10,000 years ago, but in Alaska and Canada it is believed to have survived a good deal later than this.

The imperial mammoth (*Archidiskodon imperialis*) was an enormous elephant, 13 feet or more at the shoulders, that inhabited the more temperate parts of North America in the late Ice Age, and certainly survived after the arrival of man in the Western Hemisphere.

A peculiar, primitive elephant, *Mastodon americanus*, was living in the warm southern parts of North America up to 8,000 years ago and probably later still. Traditions of huge animals with long noses exist in the mythology of the American Indians, and these suggest that mastodons may have survived into early

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In a recent issue of ANIMALS we published reviews of two books dealing with the animals of the Pleistocene or Ice Age - *Pleistocene Mammals of Europe* by Björn Kurtén (*Weidenfeld and Nicolson*), and *Prehistoric Animals and their Hunters* by I. W. Cornwall (*Faber and Faber*). Using these as his main source of information **Michael Tweedie** describes some of the animals which featured as big game in the Old Stone Age and became extinct, possibly due to the ruthless hunting of early man



Three woolly rhinoceroses (*Tichorhinus antiquitatis*), from a cave painting in the Dordogne

historical times. The mastodon was a heavily built, but not very tall elephant, 9 or 10 feet at the shoulder, with a flattened forehead and curved tusks 6 to 9 feet long. The teeth were very different from those of modern elephants, having separate conical cusps instead of the familiar transverse ridges of enamel.

Finally, there existed in Europe during the last glaciation a very large species known as the straight-tusked elephant (*Palaeloxodon antiquus*), and there is an unmistakable drawing of it in the Pindal cave in northern Spain. The tusks were long and almost straight, and were planed more widely apart in the upper jaws than in modern elephants. The shoulder height was at least 13 feet, so that it rivalled the imperial mammoth in size, and it must have been a formidable beast to hunt with primitive weapons. It probably lived in the cool-temperate forest that lay to the south of the limit of the ice sheet.

Rhinoceroses

The woolly rhinoceros (*Coelodonta antiquitatis*) tends to be bracketed with the woolly mammoth. Both are animals of a type we associate with the tropics, but adapted for living in a cold climate; both are clearly represented in the cave drawings; and frozen carcasses of both have

revealed to us details of their diet and appearance in life. In addition to these, a very well preserved woolly rhinoceros was found in Galicia, pickled in deposits impregnated with petroleum and salt. It had a woolly coat and two horns, the front one heavy and long, and it fed on grass and carried its head low, near the ground. It was not so extremely specialised for life on the tundra as the mammoth, and probably inhabited temperate steppe country as well. It seems to have died out at about the same time as the mammoth.

Two other rhinoceroses coexisted with man in parts of Europe not subjected to extreme glacial conditions – the steppe rhinoceros (*Dicerorhinus hemitoechus*), and Merck's rhinoceros (*Dicerorhinus kirchbergensis*). Both species were related to the existing small Sumatran rhinoceros of the far eastern tropics, a beast that seems likely to join them quite soon in the limbo of animals that tried for a time to share the world with man.

Unlike the elephants, the rhinoceroses never migrated to the New World.

Giant deer

The giant deer or 'Irish elk' (*Megaceros giganteus*) owes its alternative name to the fact that remains of it have been found in quantity in the Irish peat bogs. The first name quoted is more correct, as it is more

closely related to the red deer than to the elk or moose, though the palmate antlers do resemble those of an elk. Its body was about the same size as that of a North American moose, but the antlers were extraordinary, sometimes spanning 12 feet. It was widely spread in Europe and northern Asia and certainly survived after the end of the Ice Age, possibly into early historical times.

Edentates

The mammals of the order Edentata are confined to South and Central America, and are represented today by the sloths, anteaters, and armadillos, all animals of small or moderate size. During, and probably for some time after, the Ice Age, however, there were large and even gigantic edentates in existence in this area, and men, migrating from northern Asia and down through the American continents, certainly encountered them.

The most spectacular edentates were the great ground sloths. One of the largest, the elephant-sized *Megatherium*, is not known to have co-existed with man, but *Mylodon*, a rather smaller ground sloth, certainly did – as charred and broken bones of it (as well as dried and mummified skin with the hair on it) have been found in a cave in Argentina. It seems that the ground sloths walked slowly and

The cave-bear (Ursus spelaeus), from a cave-wall engraving at Les Combarelles in the Dordogne



clumsily on the ground, and reared up against trees to browse on their foliage. They must have been singularly ill-equipped to withstand the onslaught of hunting men.

A sort of giant armadillo called *Glyptodon* also survived late in South America. The biggest members of this group were 9 feet long and 4 feet high. They were encased in a hard, rigid carapace like a tortoise, which would have been excellent protection against natural predators, but no use at all against the savage newcomer who threw boulders and lit fires.

Carnivores

Early man probably did not hunt the large carnivores of his time, being more concerned with avoiding them when they turned their attention to hunting him.

Nevertheless, he came into conflict with them as a competitor, both for prey and for dwelling places.

In Europe, the cave bear (*Ursus spelaeus*) used caves as dens in which to hibernate, and the men of the Ice Age also, of course, sheltered in the caves, especially in the bitter winters of the time. Here was a conflict of interests that was quite unavoidable; bears would have had to have been evicted from desirable caves, and also prevented from intruding on the family life of established cave-men.

The people undoubtedly killed the bears when they could, but they seem to have venerated them as well, as skulls and bones of them have been found in the caves, arranged in a way that strongly suggests ritual of some kind. Thousands of skeletons of these bears have been found

in caves, but by no means all of them were killed by men. Probably the majority died there naturally during hibernation, of illness or old age.

The cave bear was a big beast, but it was not larger than the largest Alaskan brown bears of today. It differed from any of the existing species in having a bulging, dome-like forehead, a point that is obvious both from skulls and from cave drawings. It was peculiar in being a purely European animal, not ranging eastward into Asia as did all the other Old World beasts that I have mentioned.

Sabre-toothed cats

Often miscalled 'sabre-toothed tigers', these remarkable animals belonged to a distinct subfamily of the Felidae and so should not be associated by name with



any particular existing species. The largest of them were a little bigger than modern tigers and lions, heavily built and extremely powerful, but probably far less active and fast than the great cats of today. Their upper canine teeth were greatly enlarged, 5 or 6 inches long, curved, flat, and blade-like, and in some species saw-edged like a steak-knife. The lower jaw was articulated so that it could gape through more than a right angle and be tucked back out of the way of the great dagger-like upper canines. Almost certainly they hunted large ponderous beasts such as elephants, rhinoceroses, and ground sloths, leaping on them and deeply stabbing and slashing them by moving the whole head and neck. The great cat might be thrown off repeatedly by its desperately struggling, rolling victim, but its heavily muscled body was designed for tumbling and wrestling, and it returned to the attack again and again, until loss of blood or penetration to a vital organ finally disabled its prey.

It is interesting to note that the ground sloths had a sort of cobble-stone pavement of small bones in the skin; these may well have evolved as a protection against sabre-toothed cats.

Two specimens of sabre-tooths from Kent's Cavern in Britain show that they still existed in Europe during the last glaciation, and they were almost certainly still on the scene when men arrived in America. They were represented in the Old and New Worlds by two similar but distinct genera, *Machairodus* in the former, and *Smilodon* in the Americas. Rather curiously, no cave drawings of them have been found, though stone-age man must surely have known of their existence. But his motive in drawing was wholly different from ours today. He was not making a record or consciously

creating a work of art; he was engaged in magic, and he portrayed 'good' magic . . . animals like reindeer, bison, and mammoth that stood for food, or bears that provided shelter by vacating (however reluctantly) the safe, dry caves. It may well be supposed that the sabre-tooths were 'bad' magic, and as such unmentionable.

In the Old World it is questionable whether prehistoric man actually exterminated the animals that disappeared in his time. His hunting must have hastened their end, but the last mammoths probably lived and died far from the haunts of men, killed by rapid fluctuations of climate. The giant deer, with its fantastic antlers, constantly shed and regrown, must have been on its way out in any case.

In the Americas, however, it was a dif-

ferent story. The impact of fully developed hunting men on the great, slow ground sloths, glyptodonts, and mastodons, must have been catastrophic. They had no in-born fear of men as had the Old World beasts, which had evolved side by side with them, and they only lasted as long as they did because men took a long time to penetrate everywhere in the two great continents.

Hunting spelt the doom, just as surely, of the sabre-tooths, which were wholly unadapted for catching the small secretive or active animals that managed to survive. If the American aboriginal people had failed to migrate as they did, we might now be desperately seeking ways of preserving the last few ground sloths and glyptodonts - as well as the rhinoceroses and great whales. ●



Two artist's impressions of life and environment: a scene in tropical America about 20,000 years ago (left), shows *Smilodon* (sabre-tooth cat), a pair of *Mylodon* (giant ground sloth), and *Glyptodon* (giant armadillo). On the right, a possible scene from the Ice Age forests of Spain - straight-tusked elephants and their Palaeolithic hunters. These two illustrations are by Denys Ovenden. Drawings on pages 366 and 367, by Marjorie Maitland Howard, are reproduced from Dr Cornwall's book *Prehistoric Animals and their Hunters* by permission of the publishers Faber and Faber