On the Mendip Bone Caverns.

BY THE REV. W. A. JONES, M.A.

THE materials for the physical history of the earth, almost from the very dawn of creation to the present age, are scattered around us every where. The record may not always be as clear and distinct as a written record might have been, but it has been infinitely more durable and more trustworthy. It carries us back to ages long before the hand of man could possibly have registered the events to which it refers. The great facts and phenomena in this history, are not written with the pen on perishable parchment, nor cut by sculptor's art in slabs of stone or plates of brass. The record is writ by the Almighty hand itself upon the rocky tablets of everlasting ages. The chief actors and agents in the successive dramas of development in creation are brought before us, or leave unequivocal traces of their existence, and the clearest indications of their works and their ways. The successive strata which compose the crust of the earth are so many pages in the great Book wherein the history of the earth is recorded; and the fossils in our Museum are but portions of the language by which the facts are revealed.

It is so, likewise, with the objects with which the science of Archæology is concerned. The ruined Abbey, the vacant hearth of the Baronial Hall, the crumbling turret of the battlemented Castle, the mystic enclosure of Druidic worship, the worn-out traces of the hut-circles of our Keltic ancestors, are to the thoughtful observer lasting memorials full of interest and significance in the social history of our race and our country. They help us to realise and in imagination to reproduce the various phases of social and religious life which have prevailed from age to age. They constitute the leading elements in the tableaux on the great diorama of our National History, presenting to us successively the sublime, and, what I believe to have been, the simple and purely monotheistic worship of our Keltic forefathers, the idolatry and refinement of the Roman invaders, the lordly state of the barons, the learning and charity of the monks, whose cloisters and whose cells in ruined abbeys become associated in our minds with the patient toil to which we are indebted for those invaluable manuscripts which open to us the treasures of classic and of sacred lore.

With associations like these, I maintain, that the antiquary is no Dryasdust, the geologist no dreamer. It is this which makes our Museum a condensed history of the county. If I may be allowed to intrude upon my hearers my own personal experience and sentiments in this matter, I would assure you that I seldom enter into the Museum of the Society without having reproduced vividly to my mind some one or other of the thousand stirring scenes and stupendous events which stand out prominently in the history of the world. Each case has its wonders, each object its tale. The monumental rubbings on the wall, the sculptured figures, royal and ecclesiastic, the

tesselated pavement, the blunted spear, and the rude celt, carry us down along the stream of time, from the present to the long-forgotten past. And even when all human remains or tokens of human agency fail, the stream of historic knowledge still flows on—our fossils and rocky memorials of the past carrying us on further and further into the abyss of time, till the mind is lost in amazement at the vast and infinite resources of creative Wisdom, and in gratitude for the beneficence which has laid open this record to our gaze. This imperfect expression of sentiments I have long and deeply felt, and which have secured for this Society what services I have been able to render, will explain why I have generally selected, as the subjects of the papers to which you kindly listen, some one or other of the departments of our valuable Museum. I fully share with my colleagues and associates in the desire to make our Museum not merely a pleasant lounge, full of rare and curious things, but an incentive and help to *study* —a means of making our members, and especially our young friends, good naturalists and zealous antiquaries.

Among the fossils and rocks in the Museum illustrating the geological formations of this county, we have a large and valuable collection of bones, which throw much light on the more recent deposits, and help us to picture to ourselves the leading features of the animal and vegetable world in this district during the time when our beds of gravel and diluvial earth were deposited. To this subject I purpose now more especially to direct your attention; and for this we have ample materials at hand. The trunk of fossil oak dug up from beneath what are now the foundations of Taunton Gaol; the beautiful and wonderfully-perfect head of the Rhinoceros, recently found in the same locality; the tooth of an elephant, from Quan-

tockshead; and the collection of bones from the Mendip caverns;—what are they to the scientific observer? Mere pieces of timber, or fragments of bone? No. Science endows them with a living spirit; and under their guidance we enter upon the regions of the unknown world. They bid the darkness of past ages disperse, and reveal to us the haunts, in our immediate neighbourhood, of those animals which are now the denizens only of tropical climes.

It may seem sheer fancy, the soarings of unbridled imagination, confidently to assert as I now do, that the bear, the tiger, and the hyæna, have had their lair in the thickets around the Mendip and the Quantock Hills; that the elephant has trampled down under his huge feet the trees of a tropical forest in the dells of Somersetshire; and that the rhinoceros was wont to bathe its unwieldly form in the waters of our own river Tone. Yet, I feel assured that, when you have had laid before you the evidence which leads to this conclusion, you will readily admit that it is not a fiction, but a fact. The evidence is simply this: Here are the bones of the animals to which I have referred. They were all found in this county; under circumstances which, (as I shall presently show), most clearly prove that the animals to which they belonged *lived* near to the places in which the bones were found, and some at least were *born* there.

These animals do not belong to the earlier geological formations. The state and condition of the bones prove this. If you carefully examine them, you will find that the bones from the Mendip caverns differ materially in character from the fossil bones of the Saurians, for example. The bones of the Saurians are mineralized; these are not. The same is true of the remains of fossil wood. The timber found under Taunton Gaol has been turned on

the lathe into boxes and trays; but the fossil wood from Portland could not be so treated. It is mineralized. Like the Saurian remains, it belongs to a geological period far remote in the history of the earth—to the Oolite and Lias formations. After being exposed to the action of powerful acids, all the lime in these Mendip bones has been dispersed, and a portion even of the animal gelatine has been obtained, thus clearly proving that the bones, with which we are now concerned, belong to what, in geological language is termed a *recent* period, having been deposited in, or covered over with, the detritus from the troubled waters of the very last epoch of great change which this portion of the earth has known.

Some have thought that as these bones belong to animals which have never, in the memory of man, been known to inhabit these climes, they must have been brought here from a distant land, and that the animals never lived here. This appears to be the prevailing opinion among those who are unaccustomed to the modes of scientific investigation which systematic geology has unfolded; but to any one who carefully examines the bones themselves, and takes into consideration the circumstances in which they occur in the bone caverns, and the fact that in other caverns in the district, open to accumulations from the same cause, no animal remains have been found, the supposition that these bones were drifted in by the waters of the deluge cannot for a moment be entertained. If you examine the specimens in our Museum, or those in the invaluable collection made by Mr. Beard, Banwell, you cannot fail to be convinced that these are not the remains of animals brought from a distance, but of animals that were born and bred, and lived and died in the neighbourhood. Thus, in these collections, you will see the jaws of a tiger in the full vigour of youth, the teeth of which are

all perfect; by its side another jaw, in which the teeth are worn out almost to the socket; and again a third jaw, in which the teeth remain undeveloped. You have evidence of individuals of the tiger species of all ages. Here, remains of the tiger that may have died of old age in his den; close by, of the tiger's cub that may have died in its infancy. How is it possible to resist the inference to which these facts lead, and doubt that the tigers lived here? The remains of the elephant found in these caverns lead to the same conclusion. Here we have the tooth of an elephant bearing the most unequivocal marks of old age; and here the fangless tooth, in fact, the undeveloped milk-tooth of a baby-elephant. Are we not, therefore, more than justified in believing that the old animals lived, and that their young ones were born near to the places where their bones are now found?

Not only the worn-out condition of the teeth of the beasts of prey, but also the state and condition of the bones of herbiverous animals which constituted their food, most clearly prove that the caverns of the Mendips were not merely the mausoleums of the dead but the haunts of the living. By the side of the powerful jaws of the hyæna, you find the bones of an ox, bearing the marks of the hyæna's teeth. These were its food. The cracked bones of the ox and the deer, found now in these caverns, are the bones of animals carried into the wild beasts' lair, and there devoured. These facts would have been enough if they stood by themselves; but the question is placed far beyond the possibility of a doubt, by the coprolites which have been found in these caverns, the droppings of the animals by which the caves were frequented. This proves most clearly, that the animals to which these bones belonged were living in this county, and in these caves.

Having proceeded thus far, and established, I assume,

that these animals were the living inhabitants of the land, it is necessary we should turn our attention to the localities in which their remains have been found, and the circumstances under which they were discovered. In the year 1853 the head and a large number of the bones of the skeleton of a young rhinoceros were found in the alluvial deposit excavated on the site of a portion of the present Taunton Gaol. The surrounding debris was evidently washed down from the Blagdon Hills, over the red marl of the Taunton Dean: the fragments of flint and chert mixed up with the marly earth are clear indications of its source. Below the stratum of alluvial deposit in which the skeleton of the rhinoceros lay, a large quantity of timber trees were found, which were probably washed down from the hills or uprooted in the plain of Taunton Dean, about the same time that the dead body of the rhinoceros was drifted to the spot where its remains were found. These trees lay scattered about in confusion and belonged chiefly to the oak species. Alder likewise occur, and in a bed of leaf-mold, in which the leaves wonderfully retain their characteristic form, a large quantity of hazel nuts were found. So firm and sound is the timber discovered here, that tables and chairs have been manufactured from it. The head of this animal deposited in the Museum, is so perfect, with the teeth in their sockets, that there can be no doubt of the species to which it belonged. Professor Quekett has pronounced it to be a young specimen of the Rhinoceros tichorinus.

On the other side of the Quantocks the teeth of the Mammoth Elephant have been found, of which beautiful specimens were deposited in the Museum, by the late Mr. Wm. Baker. Some years ago I likewise remember to have seen at Merriott fossil elephants' teeth, which were

found between Crewkerne and Ilminster. These, however, occur only in solitary or isolated examples, and do not produce the impression which the number and variety brought to light in the Mendip district is calculated to effect. This renders it the more necessary to pay particular attention to the Mendip Caverns, in which these remains have been found in great quantities; and to endeavour to ascertain the circumstances under which the bones came there, and the agencies by which the caverns were afterwards filled with sand, and their original entrances covered over.

The Mendip range, in which the bone caverns occur, are full of interest to the antiquarian and the naturalist. From Crooks-beak, so prominent a feature in the landscape to the traveller on the Bristol and Exeter Railway, to within a mile of Frome, you may travel uninterruptedly on the Mountain Limestone. The same geological formation occurs, likewise, in masses on the flanks, and at the extremity of the main range, as in Banwell Hill, and in the hills above Hutton, stretching to Uphill and the sea at Brean-Down. The intervals between these masses, and likewise the sides of the main range, are, for the most part, covered with the marls and rocks of the New Red sandstone series. The district abounds in deep and tortuous gullies; in some cases assuming the form of immense chasms, as at Cheddar; a feature, which plainly indicates the disturbing forces to which these hills have been exposed, and by which probably they were upheaved.

The evidence of rents and upheavals abound in every direction, on the surface and below the surface. Of the former, the "Swallets" are a striking illustration, associated with the large streams which in several places gush forth from the living rock. Below the lower works of the

Charter-house mine, and about three miles from Cheddar, may be seen a very clear and characteristic form of the "Swallet." The stream which has been used to wash the "slimes," separating the lead ore from the refuse mud and sand, becomes, as might be expected, heavily charged with earthy and mineral matter. You watch its rushing flow, all muddy and discoloured, as it leaves the works, and all at once it disappears. It is swallowed up (hence the local name) through one of the many fissures communicating from the surface with the subterranean river-beds which run through the heart of Mendip. In this particular case, no fissure is visible, but the water sinks into the ground, and again makes its appearance at Cheddar, discolouring and defiling the stream as it rushes from its rocky source. In other cases the fissures are open and on the surface. An instance of this kind occurs in a field on Ubley Hill farm, on the Eastern side of the range. A stone dropped into the hole may be heard for several seconds in its downward course. Many of these fissures, no doubt, act as feeders to the subterranean channels which pour out their abundant streams from the external clefts in the rocky sides of the Mendip Hills, as at Cheddar, and at Wookey Hole.

The agencies, which for the most part produced these effects, at the same time gave origin to many caverns, opening immediately from the surface. The Caverns at Uphill, Banwell, Hutton, &c., in which bones have been found, belong to this class. The mouths or original entrances of the caves have in almost all cases been closed, or covered over with earthy matter and gravel. During the period of the earth's history in which the animals to which these bones belonged, lived, the caverns were more accessible from without than they are now. Indications of the original outlets are visible in some, and Mr. Beard

affirms that he has observed them in all: so that there were ample means of ingress and egress to these caves.

Having thus noted the origin of the caverns, and the indications afforded of their being so situated as to become fitting haunts to such wild beasts as might be living in the district, we have, to some extent, a clue to the circumstances under which the bones came there. I admit that there are difficulties to be encountered; some which I do not profess to be able to solve; others which are accounted for by the lapse of time during which the same cavern at long intervals may successively have been occupied by various species of beasts of prey. In this way the occurrence in the same cavern, as at Bleadon, of the bones of the tiger, the bear and the wolf; and at Sandford Hill, of the tiger, hyæna and wolf, which are not usually associated together, may be accounted for. In some of the caverns, as at Banwell and Uphill, no remains of the tiger were found, but only those of the wolf and bear in one, and of the hyæna in the other, with the bones of deer, ox, and horse in such quantities as clearly to prove that they are the accumulations of long ages. Then, as to the elephants, it is clear from the characteristic features of the teeth, that the remains of two distinct species, at least, are found in these caverns; the one closely allied to the recent Asiatic Elephant, and the other to the African species. Whether these were coeval or not, does not appear; but, judging from analogy, we should be led to refer them to different periods.* The collection in our

* The author has been gratified to find his conclusions in this particular confirmed by Dr. Falconer, a distinguished member of the Geological Society, who has made the classification of fossil elephants his special study. According to Dr. Falconer, the two species are *Elephas primigenius*, and *Elephas antiquus*. He further expresses his belief that they belong to two distinct epochs, but the caves having been open during both periods, bones of all the species have been promiscuously mingled in the cave collections.

Museum, and that at Mr. Beard's, contain many large vertebræ, ribs, thigh bones, and humeri, together with tusks and teeth. The more durable portions, such as the teeth, are found in larger numbers in proportion, probably because the softer bones were either devoured, or have perished from decay. Whether the animals while living resorted to these caverns, or whether their dead carcases were dragged thither by beasts of prey, I do not pretend to determine, but the general character of the bones, together with the masses of a soft fatty substance, which I have myself found, like what is technically called *adipocere*, and which is supposed to be produced by the decomposition of the flesh of animals, clearly proves, I think, that some of the animals at least lived, and that portions of others were devoured in the caverns, at a time anterior to that period of great change, during which the original entrances were blocked up, and the bone beds themselves more or less covered with a deposit of earth and loose rubble.

It is unnecessary to enter upon a detailed account of the precise physical and dynamic forces by which so great an overflow of waters might have been produced. The crust of the earth bears undoubted evidence of greater convulsions than would be needed to effect such a result. Sufficient to state generally that it must have been by the agency of moving waters, bearing into and depositing on the entrances of these caverns stones and earthy matter. And as the corners of the rocks in the interior are sharp, and not rounded and smooth, as you will always find them in caverns on the sea-shore accessible to the tide, it is evident that these caverns have not been subject to the long-continued action of water in motion, but were submerged by a sudden and temporary flood.

Here the question may occur to some one, "Were there any human beings inhabiting the island at the time?" You will, I have no doubt, anticipate the answer, which I at least would give. I believe that the period to which these animal remains belong was immediately anterior to the last great change which prepared the earth for the reception of the human race. I know that the fact that portions of human skeletons have been found in some of the caverns, may at first sight seem to overthrow my position; but when each alledged case is carefully investigated, it will be found that the human remains belong to a much more recent period. Thus, according to Mr. Phelps in his *History of Somerset*, human remains have been found at Wookey Hole. There is a true bone cavern at Wookey Hole, which has been discovered only during the present year, but that to which Mr. Phelps refers has long been known, and, like those at Cheddar, has never been said to have contained the class of animal remains to which this paper is specially devoted. The case at Wookey therefore goes for nothing. Besides, this cave has been accessible from time immemorial. The name it bears proves it to have been known to the Keltic inhabitants of the land before the Saxon invasion. "Wookey" is clearly a corruption of the Welsh "Ogo," which to the present day means a "cavern." But in the cave called Goat's Hole, at Paviland, in Glamorganshire, we have a case in point. There a human skeleton was found lying on the remains of the elephant, rhinoceros, the bear and the tiger. The late Dean of Westminster, Dr. Buckland, describes this cavern in his *Reliquiæ Diluvianæ*, p. 82. It is in the limestone and opens on the face of the sea-cliff. The tide reaches the base of the ancient diluvial deposit within. The animal remains are of precisely the same class with

those that are found in the Mendip caverns. They clearly belong to the same period. But here, unlike the Mendip caverns, the bones appeared disturbed by ancient diggings, showing that it had been accessible to man, in ages long gone by. Of this however, undoubted evidence was supplied, for a little under the surface a female skeleton was discovered. From the description given of the manner in which the bones lay, there can be no doubt that the body was interred there with great care and tenderness. Ivory rods, nearly cylindrical, portions of ivory rings, and a number of sea shells were found near the skeleton, just in the same way as such things occur in graves and sepulchral remains of early times. In the same cave were found the tusks of the elephant, but so far decayed as to crumble at a touch. When these rings were made the ivory must have been firm: and the subsequent decay leads us to infer that the human skeleton probably dates from a period not far distant from the Roman occupation. Charcoal and remains of human food were likewise found in this cavern, thus indicating two successive occupations of the cavern, at periods long, long distant from each other. What a theme for a poet! The weird maiden laid to rest, with her ivory needles, her ivory rings, and toys of pearly sea-shells by her side, in the cavern where she had dwelt among the remains of a former world! There she lived, and there she died, carving her needles and her toys from the ivory of primæval elephants; and possibly theorizing, as we are now doing, on the origin and history of the wonderous occupants of the cave. But it is not with the poetry we are now concerned, only with the fact; and the facts do not oppose, but rather confirm, the view we have advanced.

Indeed, very few of the Mendip bone caverns were known to exist until within, comparatively, a few years. Their

discovery is mainly due to mining operations, carried on in a rude and simple manner on the surface of the hills. Any one who would visit the old "ochre" pits on the hill above Hutton, and notice how the excavations expose fissures in the solid rock beneath, will readily understand how that these appearances would give rise to further investigation. The search for the *lapis calaminaris*, a mineral at one time in great demand—a carbonate of zinc, used in the manufacture of brass—likewise helped, but only as by accident, to the discovery of these bone caverns. Happily for the cause of science, there were two men living in the neighbourhood who did not fail to profit by the discovery, and carefully collected together and preserved the remains which these caverns contained. The perseverance and enthusiasm of Mr. Beard, and the science and energy of the late Rev. D. Williams, of Bleadon, have preserved to us these interesting relics of the past, opening to us another page in the great Book of Nature on which are recorded the works and ways of the Most High.

Another curious and interesting feature, and one which may be of great service in determining the various forms of animal life that prevailed during successive periods, presents itself in the fact communicated to me by Mr. Beard, as the result of his observations;—that each of the Mendip bone caverns has its own peculiar and characteristic set of remains. Thus:—

Banwell	contains	bear, wolf, deer, buffalo.
Uphill	,,	hyæna, deer, horse.
Hutton	,,	hyæna, wolf, tiger, elephant, horse.
Bleadon	,,	tiger, bear, wolf, fox, elephant, ox, deer, horse.
Sandford Hill		tiger, hyæna, wolf, rhinoceros, ox, deer, boar, horse.
Burrington	,,	the bear and fox.

To this list I am now able to add the bone cavern recently discovered at Wookey, which promises to be as full of interest as any of those previously known. A very slight cutting made along the side of the hill, in the formation of a new water-course, leading from the water-head to the recently-erected paper mills, laid open the mouth of this cavern. Although, as yet, it has not been properly explored, the remains obtained in it include the teeth of the following species: elephant, rhinoceros, tiger, bear, and hyæna, with the bones usually associated with them.* There are doubtless very many other caverns in the district, the entrances to which are as near the surface, and the chambers of which are as richly stored with the skeletons of the extinct races of the fauna of this county, only waiting for accident to bring them to light. It would appear that most of the remains in our Museum, which form a part of the Williams collection, were found in the Hutton and Bleadon and Sandford Hill caverns.

A notice of these remains, however, would be incomplete without reference to the huge proportions of most of the animals of that period, as compared with those of the present day. Take for example the ox, the *Bos Bleadon*, as Mr. Williams very justly styled the animal. There are some of his bones in the Museum. The largest prize ox of the present day would sink into utter insignificance by his side. Mr. Beard has the head and horn-bones of animals of the same species, and of the same massive dimensions. I am afraid to trust myself with the outline which a due regard to proportion would require. It is truly terrific, according to our present notions of animal forms. Then, consider the femur, the thigh-bone of an

* Specimens of the above from Wookey have recently been presented to the Museum by Dr. Boyd, of Wells.

elephant, in our collection. The largest elephant known would be small and puny by the side of the individual to whom this bone belonged. This bone is 22 inches in girth. The *tusk* of the same animal (possibly), or one like him, in Mr. Beard's collection is six feet long, and two feet in circumference! and it is supposed that it must have been full 16 feet long when the animal was living. The size of the beasts of prey in those days was on the same scale. The fangs of the tiger and the bear in our Museum prove that; but the skulls in Mr. Beard's collection establish it beyond a doubt. There I saw the thigh-bone of a bear 21½ inches long! I placed by its side the corresponding bone of a full-grown bear killed at Bristol. The bear of the Mendip Hills must have been three or four times as large! The skull of a bear in his collection is nearly two feet long. The same applies to the remains of the tiger. The bones of the head found in these caverns clearly prove the species to have been of a considerably larger size than any known species in the present day. The hyænas of that period, in like manner, were of gigantic dimensions, as the size of their heads and jaws testify. I need not enlarge upon the remains of the deer tribe with branching antlers, nor upon those of the boar, the horse, the ox, and the sheep, which are found in great abundance in the caverns. The bones of these animals occur in such numbers as clearly to shew that they were the food of the carnivorous beasts of prey, whose haunts were in these caves. I do not attach much importance to the remains of hares, mice, rats, and bats, which are deposited in our Museum, as having been found in the Mendip caverns. That animals of these species existed cotemporaneously with the tiger and the elephant is not improbable, but the bones we have appear as if they belonged to a much more

recent period, and the easy access through the fissures in the rocks would account for their occurrence in these caves. I mention these only as supplying materials for the picture of animal life as it existed in those days.

I will not attempt to fill up the details in this picture. Having supplied you with the facts, I must leave each one to imagine the altered aspect which the forest trees and tropical foliage of that period would give to our hills and dales. That these features of vegetable life were the accompaniments of these particular forms of animal life in those ages, as well as in this present age, is more than probable, only with such modifications as would account for the appearance of the hazel and the alder, found in the excavations at Taunton.

The picture thus realized may be novel and grand; but the actual living picture with which we are now favoured in the Vale of Taunton Dean, and in the dells of Somerset, is nevertheless far better, and more to be desired. Deeply as I am interested in this collection, so much so that I would almost deem it sacrilege wilfully to destroy a single bone, yet I am free to admit that I have considerable satisfaction in knowing that these are the bones of the dead, not of the living. But "de mortuis nil nisi bonum." They did their work in their day. Let us strive to do ours, and so do our work in advancing the Archæology and Natural History of our land, that coming generations may not despise our labours, nor rejoice in that we are gone.