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V. *Mastodon Remains, in the State of Missouri, together with Evidences of the existence of Man contemporaneously with the Mastodon.* By Dr. ALBERT C. KOCH.

It will perhaps be recollected that, some twenty years ago, I commenced making somewhat extensive researches and excavations for Mastodon remains, in the State of Missouri, and continued them until, at one time, I was in possession of more than six hundred teeth of Mastodons of different ages and sexes, seventy-three inferior maxillas and nearly as large a number of superior maxillas, with portions, greater or less, of the skull attached to them; five skulls; a large collection of tusks of all sizes; numerous bones of the extremities and other parts of the body, and the nearly complete skeleton, described by me under the name of the "*Missourium*," being the same which is now in the British Museum. This collection contained parts of animals of various ages, from the young suckling to the oldest patriarch, whose last molars were worn down to a level with the gums. By means of this collection, (what had been my principal design in making it), Palæontologists were enabled to throw much light on the dental system of this remarkable genus, then very superficially known. When, however, I brought this collection before the American public, it seemed to be very little appreciated, as was the case, afterwards, with the instructive collection of *Zeuglodon* remains, which I had discovered and exhumed in the State of Alabama; and for this reason I was compelled to take them to Europe, where, their scientific value being more fully acknowledged, they were purchased and placed in the British Museum, and in the Royal Museum of Berlin. The general interest taken in these remains, in Europe, induced me, in addition to a paper which I read before the Geological Society of London, to publish a small work in the German language, at Berlin, in 1845,* in which is given a minute description of all these remains of Mastodon, together with the most important facts connected with their discovery. But inasmuch as this work has never appeared in the Eng-

* *Die Riesenhiere der Urwelt*, von Dr. Albert Koch. Berlin, Verlag von Alexander Dunker, 1845.

lish language, and is, perhaps, little known in America, I hope it will not be altogether unwelcome, if I lay before the Academy a repetition of some of the facts which were stated in that work, and which furnish some very striking evidences of the existence of Man, on this continent, in the age of the living *Mastodon*. I do this the more readily, for the reason that some account of this discovery was published, anonymously, at the time, in the Philadelphia "Presbyterian" newspaper, from which it was copied into the Amer. Jour. of Science (vol. xxxvi. p. 199), with some expressions of regret by the editor, that facts, so highly interesting and important, should be left to rest on anonymous authority merely.

I will state then, that, in the year 1839, I discovered and discovered, in Gasconade county, Missouri, (Lat. 36° 20' N.) at a spot, in the bottom of the Bourbeuse River, where there was a spring, distant about four hundred yards from the bank of the river, the remains of one of the above-named animals. The bones were sufficiently well preserved to enable me to decide, positively, that they belonged to *Mastodon giganteus*. Some remarkable circumstances were connected with this discovery. The greater portion of these bones had been more or less burned by fire. The fire had extended but a few feet beyond the space occupied by the animal before its destruction; and there was more than sufficient evidence on the spot, that the fire had not been an accidental one, but, on the contrary, that it had been kindled by human agency, and, according to all appearance, with the design of killing the huge creature, which had been found mired in the mud and in an entirely helpless condition. This was sufficiently proven by the situation in which I found as well those parts of the bones which had been untouched by the fire, as those which were more or less injured by it, or in part consumed; for I found the fore and hind legs of the animal in a perpendicular position, in the clay, with the toes attached to the feet, in just the same manner in which they were, at the moment when life departed from the body. I took particular care, in uncovering these bones, to ascertain their position, beyond any doubt, before I removed any part of them; and it appeared, during the whole excavation, fully evident, that, at the time when the animal in question found its untimely end, the ground, in which it had been mired, must have been in a plastic condition, being now a greyish colored clay. All the bones which had not been burnt by the fire had kept their original position, standing upright and apparently quite undisturbed in the clay; whereas those portions, which had been exposed above the surface, had been partially consumed by the fire; and the surface of the clay was covered, as far as the fire had extended, by a layer of wood ashes, mingled with larger, or smaller, pieces of charred wood and burnt bones, together with bones, belonging to the spine, ribs, and other parts of the body, which had been more or less injured by the fire. The fire appeared to

have been most destructive around the head of the animal. Some small remains of the head were left unconsumed, but enough to show that they belonged to the Mastodon. There were, also, found mingled with these ashes and bones, and partly protruding out of them, a large number of broken pieces of rock, which had evidently been carried thither from the shore of the Bourbeuse river, to be hurled at the animal by his destroyers; for the above-mentioned layer of clay was entirely void of even the smallest pebbles: whereas, on going to the river, I found the stratum of clay cropping out at the bank, and resting on a layer of shelving rocks of the same kind as the fragments; from which place, it was evident they had been carried to the scene of action. The layer of ashes, etc., varied, in thickness, from two to six inches; from which it may be inferred that the fire had been kept up for some length of time. It seemed that the burning of the victim, and the hurling of rocks at it, had not satisfied its destroyers; for I found, also, among the ashes, bones, and rocks, several arrow-heads, a stone spear-head, and some stone axes, which were taken out in the presence of a number of witnesses, consisting of the people of the neighborhood, attracted by the novelty of the excavation. This layer of ashes, etc., was covered by strata of alluvial deposits, consisting of clay, sand, and soil, from eight to nine feet thick, forming the bottom of the Bourbeuse, in general; and on the surface, near the centre of the spot on which the animal had perished, was situated the spring, the water of which was used for domestic purposes; and it was in digging to clear out the spring, that the existence of bones there had been first discovered by the owner of the land.

It was about one year after this excavation, that I found, at another place, in Benton county, Missouri, in the "bottom" of the *Pomme de Terre* river, about ten miles above its junction with the Osage, several stone arrow-heads mingled with the bones of the same nearly entire skeleton mentioned above as the "*Missourium*." This discovery is already so well known, that I will merely mention the circumstance, in this connection, that the two arrow-heads found with the bones were in such a position as to furnish evidence still more conclusive, perhaps, than in the other case, of their being of equal, if not older date, than the bones themselves; for, besides that they were found in a layer of vegetable mould which was covered by twenty feet in thickness of alternate layers of sand, clay, and gravel, one of the arrow-heads lay underneath the thigh-bone of the skeleton, the bone actually resting in contact upon it; so that it could not have been brought thither after the deposit of the bone; a fact which I was careful thoroughly to investigate.

This layer of vegetable mould was some five or six feet thick, and the arrow-heads and bones were found, not upon its surface, but deeply buried in it, together with fragments of wood and roots, and logs and cones of cypress; but no pebbles were observed in it.

Above this layer of mould there were six distinct undisturbed layers of clay, sand, and gravel, viz., three of greyish clay, and three of pebbly gravel mixed with coarse sand; in all, twenty feet in thickness; and a forest of old trees was standing on the surface soil. This bottom is still subject to occasional overflow, in very high stages of water.

If we consider the manner in which these river bottoms have been formed, as it has been admirably illustrated by Prof. Swallow, (Rep. of Geol. Sur. Missouri,) the layers of vegetable mould appearing to have been formed at the bottom of lakes, or in swampy depressions, left filled with water on the retiring of the greater overflows, or on a change of the bed of the river, at distant periods of time, and that, in these lakes and depressions, a deposit, at first, of clayey sediment, and then, of decaying vegetable matters, gradually accumulates to a considerable depth, before another overflow covers the whole, again, with a layer of sand and gravel, it would seem necessarily to be inferred, that this animal must have perished in such a lake, or swamp, and that his skeleton, being thus quietly deposited, was slowly covered over in course of the gradual formation of the vegetable layer; and that it could not have been drifted by the high waters of the river from another and older position to be re-deposited upon the arrow-head at a period later than that in which the Mastodon lived.
