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## ARTICLE IV.

IMPLEMENTS OF THE STONE AGE A PRIMITIVE DEMAR-  
CATION BETWEEN MAN AND OTHER ANIMALS.<sup>1</sup>

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WHEREVER on the face of the globe there is found an implement of any sort, we say, at once, Man has been here. It may be that, as in the caves in the Dordogne, there are rude sketches of art to associate the flint and bone implements with the handiwork of man; or, as in the lake findings in Switzerland, there may be traces of human habitations to identify the stone utensils with the building of the pile-dwellings; or, as in the shell-mounds (Kjokkenmöddings) of Denmark, a ruined hearth-stone and the bones of birds and animals of the chase, skilfully opened for their marrow, may point to man as the maker and user of the implements found in these heaps of refuse; and it may even happen that sometimes in the same place of deposit with the primitive implements of stone is found an indubitable relic of man himself, in a small fragment of the human skeleton. Yet in all these cases the implement itself, apart from its accessories, is an argument for the presence of man. The implement certifies the man as really as the man certifies the implement. This no one would think of disputing; but I give emphasis to the unanimity of science on this point, because of its bearing upon the primitive *differentia* of man as a species. We say, If man was indeed contemporary with these wild denizens of the caves, then these are the weapons with which he slew them, the implements with which he prepared them for his food; and the finding of the implements imbedded with the animal remains is evidence that man was contemporary with such animals.

<sup>1</sup> A paper read at the "Congrès International d'Anthropologie et d'Archéologie préhistoriques," at Budapest, Hungary, September 1876.

If we go back to the river-drift gravels, as, for instance, in the valley of the Somme, where we have no trace of human habitations or other works, and perhaps no authentic specimen of a human bone, but simply compare one stone with another, we say, again: Man was here at the remote period of this formation; for these flints are shapen, adapted to a use, and are no longer stones, but implements. We may raise the question whether the findings are genuine or forgeries, whether "the flint implements are of the same age as the beds in which they are found," or have come there by accident, or have sifted down from some later deposit; but if they are genuine, and of the same age with the drift, we hold them for conclusive proof that man was there in that age.

But in making this decision, do we not unconsciously impose upon ourselves with the tacit presumption that only man is capable of making and using an implement? Science cannot admit a presumption, except as a tentative hypothesis; she must rest all her conclusions on the known basis of fact. But that only man is capable of making an implement is a fact of observation and experience, and not merely a presumption *à priori* from something in the nature of man. Such a presumption is, indeed, valid as against physical nature. Wherever we perceive adaptation to an end we do immediately ascribe such adaptation, or the thing so adapted, to an intelligent purpose. Whether this reference of adaptation to intelligence is intuitive, or the result of cumulative experience, this is not the place to argue. Suffice it to say, that wherever adaptation is found, the conviction of the human mind is immediate, universal, and absolute, that there was enough of foresight and skill to produce that adaptation. But we never ascribe such foresight and skill, such intelligent purpose, to physical nature. Nature furnishes the stone and the iron; but nature does not make the hammer, the knife, the axe, the spear. Nature abounds in materials of which man can build himself a house; but beyond the cave in the earth and the leafy covert in the wood, she provides nothing

for his habitation. The crude material lies in the lap of nature; but the shaping of this material to any use or end requires a degree of intelligent purpose of which we find in inorganic nature no trace nor suggestion. Hence, as against inorganic nature, the presumption does hold *à priori*, that man, as a creature of intelligence, is alone capable of making an implement, of transforming inorganic matter into a tool for use.

But this presumption from the nature of man does not hold as against other animals. For, though intelligence must be presupposed wherever we perceive adaptation, yet whether other animals than man possess the kind or degree of intelligence requisite to fashioning an implement for a specific purpose, is a question of fact that only observation can determine; and observation has decided this in the negative. There is no instance on record of any animal making an implement for a special use or end. There are animals and birds that use the materials of physical nature with much ingenuity and skill in building their houses and nests. It is enough to instance the intelligence of the beaver in adapting stone, wood, earth, and water to his wants, and in surmounting the obstacles to his task in some less favorable site. There are tribes of *Simiæ* that use stones and sticks for cracking nuts or as weapons of defence. But all this is far removed from the making of implements for a purposed use. The beaver chooses his stones and breaks or twists his sticks; but he never shapes a stone with which to cut and shape a stick. The chimpanzee takes a stone to crack a nut; but he takes it up a stone, and lays it down again a stone; he never shapes it to a hammer, fits it with a handle, to be reserved for this special use. The baboon throws a stone to wound or frighten his enemy. He never shapes the stone to a spear-head or a battle-axe, to be kept by him for the service of war. No animal goes beyond using the crude material that nature furnishes. He may use this skilfully and well, adapting it to his own necessities; but he does not improve upon nature, does not change the form of

her crude material, making of this an instrument for higher ends; does not make an implement in the sense which we attach to that word in the hands of man. Hence the implement is a line of demarcation between man and other animals. This fact, again, is well-nigh universally accepted by differing schools of scientists; though Mr. Darwin gives it but a qualified assent,<sup>1</sup> and Sir John Lubbock suggests that tool-making was at first a matter of accident.

But though the use of implements is acknowledged to be a line of demarcation between man and all contemporary animals, it is argued that existing species of *Simiae* have reached the limit of their development, but, there were prehistoric species which by natural selection attained higher and yet higher stages of progress, until the first type of man emerged, when the anthropoidal progenitor gradually became extinct. Hence it is said to be unfair to make the use of implements a demarcation between man and pre-existent animals, or a characteristic of his standing in the scale of being.

To this objection there are two replies. First, in the present state of scientific knowledge, there is no tangible evidence of the existence of any such higher kind of apes. The links between the highest known species and man must have been many and long; but no trace of these has yet been found. True, this is a merely negative reply. But the existence of such species of apes is a pure *assumption* based upon analogy. Now the want of *data* — that is to say negative evidence — is logically valid against an assumption. Since then, the links of connection are wanting, this anthropoidal pedigree of man must be held in suspense as only an hypothesis. Darwin presents it with his accustomed modesty.<sup>2</sup> But Haeckel goes so far as to say, “we must necessarily come to the conclusion that *the human race is a small branch of the group of Catarrhini, and has developed out of long since extinct apes, of this group in the Old World.*”<sup>3</sup>

<sup>1</sup> Descent of Man, Vol. i. p. 49.

<sup>2</sup> Ibid., Vol. ii. Chap. xxvi.

<sup>3</sup> The History of Creation, Vol. ii. Chap. xxii. (The italics are his own).

Now there is danger that an unproved inference put forth with such authority shall be prematurely accepted as the verdict of science. But though we would concede much license to hypothesis, yet in the name of science as well as of logic, we must protest against putting assumptions in the same category with facts, and drawing authoritative conclusions from hypotheses as if these were facts established before our eyes. Until, therefore, some trace is found of a tool-handling ape, we are warranted by all known facts in adhering to the use of implements as a primitive demarcation between man and other animals.

My second answer to the objection is, that it proves too much for the objector himself. The whole argument for the derivation of man from a lower form of animal is drawn from the correspondences between man and the inferior animals as we see those animals to-day. This correspondence is traced by Darwin in almost every particular—intellectual, emotional, and even moral. Huxley says, “No absolute structural line of demarcation, wider than that between the animals which immediately succeed us in the scale, can be drawn between the animal world and ourselves; and I may add the expression of my belief that the attempt to draw a psychical distinction is equally futile, and that even the highest faculties of feeling and of intellect begin to germinate in lower forms of life.”<sup>1</sup>

It is the homology of man with the animal world *as it is*, and the manifold correspondences of known species of animals with man, as well as the general analogy of nature, that leads to the theory that man is derived from some lower animal progenitor. Well, we go back to the Stone Age, and there find man differentiated from animals in a most pronounced manner. The implements are evidence that man was there; but directly we come upon this demarcation we are told not to compare man *in this particular* with existing animals which he resembles in so many other particulars, but to presuppose extinct species of a higher grade that paved

<sup>1</sup> Man's Place in Nature.

the way from the stone to the tool! To use a homely adage, "One cannot burn the same powder twice over"; and one cannot use the same facts to establish both the positive and negative side of his argument. Mr. Wallace has set forth the lessons of the Stone Age with rare felicity. Having described the long processes of development in nature, he says, "At length there came into existence a being in whom that subtile force we term *mind*, became of greater importance than his mere bodily structure. Though with a naked and unprotected body, *this* gave him clothing against the varying inclemencies of the seasons. Though unable to compete with the deer in swiftness or with the wild bull in strength, *this* gave him weapons with which to capture or overcome both. Though less capable than most other animals of living on the herbs and the fruits that unaided nature supplies, this wonderful faculty taught him to govern and direct nature to his own benefit, and make her produce food for him when and where he pleased. From the moment when the first skin was used as a covering, when the first rude spear was formed to assist in the chase, the first seed sown or shoot planted, a grand revolution was effected in nature, a revolution which in all the previous ages of the earth's history had had no parallel; for a being had arisen who was no longer necessarily subject to change with the changing universe—a being who was in some degree superior to nature, inasmuch as he knew how to regulate and control her action, and could keep himself in harmony with her, not by a change in body, but by an advance of mind."<sup>1</sup> This we see already in the Stone Age. But whence came this capacity in man, or whence came man having this capacity?

It has been suggested that man came by accident to the use of implements; that the savage, beginning like the monkey with using a round stone for cracking nuts, accidentally discovered that he could crack other stones also,

<sup>1</sup> Anthropological Review, May, 1864, p. clxvii; also reprinted in "Natural Selection," p. 325.

and sharpen these for cutting ; and, moreover, by thus eliciting sparks he made the accidental discovery of fire.<sup>1</sup> Now all this may have been ; but it is an unscientific method to take our present knowledge of implements and their uses and prescribe from this the way in which the primitive man must have invented his tools. It is, to say the least, a curious accident that no such accident as is here imagined for the savage ever happened to the monkey ; that it never occurred to *him* to crack a stone and shape it into a knife, or to gather sparks for kindling a fire. And it is still more curious — indeed unaccountable upon the theory of a kindred intelligence — that no monkey, baboon, chimpanzee has profited by the example of man in learning to make implements of the crude native materials about him. Different tribes of savages, it is believed, have separately stumbled upon these inventions ; but in all the ages since the Stone Age, no tribe of *Simiæ* has either stumbled upon such inventions or copied them from man. The most savage tribes learn from civilized man to improve their weapons of warfare ; sometimes copy with deadly effect the weapons and tactics of their superiors ; but no tribe of *Simiæ* has yet learned to make the simple weapons of stone that even the rudest savage manufactures for himself. All experience teaches us that man is the only animal capable of fashioning an implement for a specific purpose ; and hence the implements of the Stone Age are a primitive demarcation between man and other animals.

This fact has no necessary bearing upon the question of man's derivation as to his bodily frame ; but it does mark very distinctly a point of departure in the crude pre-historic data of our race. The Stone Age is after all an age of human capacity, discovery, invention, and also of prophecy, and we need not be ashamed of our connection with it. Admitting that the first suggestion of a knife, the first hint of fire, came of the accidental striking of two flints together ; in the same sense it may be said that the invention of the

<sup>1</sup> Sir John Lubbock's *Pre-historic Times*, chap. xiv.

steam-engine was accidental, being suggested by the vapor lifting the lid of a tea-kettle ; and if we may accept the legends about Newton and Galileo, the discovery of gravitation was due to the accident of a falling apple ; the suggestion of the heavenly motions, to the accidental swinging of a chandelier. In every case there was something in the man for the accident to work upon ; the accidental sharpening of the stone sharpened his capacity into a purpose for adapting inorganic nature to his use ; the first spark struck from the flint elicited a spark from his consciousness that kindled to a flame of invention. What we see in the Stone Age is man asserting his supremacy over nature by taking into his own hands her raw materials and shaping these to his higher uses. The first attempts are crude enough, and the progress to polished and ornamental implements, and to works in metal, is toilsome and slow. But the germ of great possibilities is there ; the science of architecture is there ; the science of engineering is there ; the science of husbandry is there ; all arts, manufactures, inventions are potentially there ; for in building the cathedral, the fort, the viaduct, in forging Krupp's cannon, and the armor of the Thunderer, man is but carrying to higher and yet higher perfection that which he began to do when he first formed the rough materials about him into tools and weapons for his own use. He then began the mastery of nature through his adaptive intelligence and his purposing will. All that he has yet accomplished in subordinating and adapting nature to his ends has been through the development of the faculty that first taught him to shape an implement out of a stone. That line of demarcation separates man on the one side from physical nature by all that is possible in invention, and on the other side separates him from other animals by all that is actual in achievements over nature.

Hence the prominence given by science to the Stone Age involves no controversy with the philosophy of man. That age is not derogatory to man as philosophy would present him in his intellectual and moral attributes. The surveying,

measuring, choosing, purposing, conquering intelligence is already there, discriminating him from the brute not only quantitatively, but qualitatively also. The old arguments of philosophy for the exaltation of man are indeed brought in question by modern science. Consciousness, language, reason, reflection, memory, imagination, the domestic affections, the emotions, and even the moral feelings—all these once assumed to be distinguishing prerogatives of the human species are now claimed in some degree for different animals. I shall not trespass here on this debatable ground. Science has first of all to do with facts, without regard to their bearing upon theories of philosophy and ethics. But it is science that offers us the Stone Age as an incontestable witness for man. And surely, the germs of the spiritual and the ethical are given in an intelligence that first addressed itself to the mastery of rude nature for human ends. The conquest of thought over matter began in the making of implements; and the first rude scratches to record memory, feeling, or fancy foreshadowed that supreme implement of thought by which man gives permanence to knowledge by the written page, records the phenomena of nature and the discoveries of science, and transmits to other ages the history of the race.