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Prehistoric

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PRIMITIVE WARFARE.

A LECTURE DELIVERED AT THE ROYAL UNITED SERVICE INSTITUTION.

(Authors alone are responsible for the contents of their respective memoirs.)

LECTURE.

Friday, June 28th, 1867.

COLONEL PHILIP J. YORKE, F.R.S., in the Chair.

PRIMITIVE WARFARE: ILLUSTRATED BY SPECIMENS FROM THE MUSEUM OF THE INSTITUTION.

By Colonel A. LANE FOX, Grenadier Guards.

ALTHOUGH it is more in accordance with the purposes for which this establishment has been organised, that the Lecture-room should be devoted chiefly to subjects of practical utility connected with the improvement of our military system and the progress of the mechanical appliances, the organization, and general efficiency of our Army and Navy, than to the efforts of abstract science, yet the fact of your possessing in the three large apartments that are devoted to your armoury, one of the best assortments of semi-civilized and savage weapons that are to be found in this country, or, perhaps, in any part of the world, is sufficient to prove that it is not foreign to the objects of the Institution that the science of war should be ethnographically and archaeologically, as well as practically, treated.

The requirements of our advancing age demand that every vein of knowledge should be opened out, and, in order to make good our title to so interesting a collection of objects as that comprised in, what may very properly be called our ethnographical military department, it should be shown that, whether or not the subject may be considered to fall within the ordinary functions of the Society, our Museum is made available for the purposes of science.

The age in which we live is not more remarkable for its rapid onward movement than for its intelligent retrospect of the past. It is reconstructive as well as progressive. The light which is kindled by the practical discoveries of modern science, throws back its rays, and enables us to distinguish objects of interest, which have been unnoticed in the gloom of bygone ages, or passed over with contempt.

Men observe only those things which their occupations or their education enable them to understand and appreciate. When a savage is introduced on board the deck of a European vessel, he notices only those objects with the uses of which he is familiar—the sewing of a

coat, a chain or a cable at once rivets his attention, but he passes by the steam-engine without observation, and if a work of art is forced upon his notice, he is unable to say whether it represents a man, a ship, or a kangaroo!* So in past ages the flint implements of the drift, the parents of all our modern implements, whether for war or handicraft, must have been carted away in hundreds, unobserved, and in ignorance that these inconspicuous objects would one day be the means of upsetting the received chronology of our species.

Whilst, therefore, we devote our energies chiefly to progress, and fix our attention upon the present and future of war, it cannot fail to interest those who are actively engaged in the duties of their profession, if we occasionally take a glance backward and see what recent discoveries have done towards elucidating its origin and early history.

It might, perhaps, assist a right understanding of the principles on which the weapons and implements of savages deserve to be studied, if I were to notice some of those great questions respecting the origin of our species, and man's place in nature, which the investigations of science have been the means of raising in our day. I need hardly say that the rude implements, which I am about to describe, are of little practical interest in themselves, as models for instruction or imitation. We have no need of bows and arrows in the existing state of war, and if we did require them, the appliances of modern times would enable us to construct them in far greater perfection than could be acquired by any lessons from savages. These weapons are valuable only, in the absence of other evidence, from the light they throw on pre-historic times, and on those great questions to which I have alluded, and from their enabling us to trace out the origin of many of those customs which have been handed down to us by past generations.

As, however, the discussion of these interesting subjects would lead me into matters that are hardly suited to the Lecture-room of this Institution, I must pass over the consideration of them with a few brief remarks.

In so doing, I may appear to postulate some opinions upon points that are still the subject of animated controversy in the scientific world. But it would require a far broader field of investigation than is here afforded me, in order to treat these inquiries successfully, and to adduce all the evidence that would be necessary to support the hypotheses put forward; and I am anxious to devote no greater space to these preliminary remarks than is necessary to point out some of the main features of interest that are involved in the particular study which forms the subject of my lecture.

We are apt to speak of the creation of the universe as a thing of the past, and to suppose that the world, with all the varied life upon it, previous to man's appearance, having been created for his especial happiness and supremacy, was afterwards left to his control and government. But this view of the subject belongs to an age in which the laws of nature in their all-sufficiency and completeness were but little

* Beechey's Voyage to the Pacific, p. 298. Oldfield's Aborigines of Australia. Transactions of the Ethnological Society, vol. iii, new series, p. 227.

studied and appreciated. Modern science finds no evidence of any such abandonment of the universe to man's jurisdiction. The more comprehensively the subject is viewed, the more restricted appear to be those limits over which the free will of mankind is permitted to range, and the more evident it becomes, that in his social advancement, his laws, arts, and wars, he moves on under the influence and development of those same laws which have been in force from the very first dawn of creation. The lower the archaeologist searches in the crust of the earth for the relics of human art, the more faint become the traces of that broad gulf, which in our times appears to separate man from the brute creation. In all the numerous and varied offsprings of the human intellect, in the arts, and even in speech, the more we investigate and trace them back, the more clearly they appear to point to a condition of the human race in which they had no existence whatever. The great law of nature, "*natura non facit saltum*," was not broken by the introduction of man upon the earth. He appears to have been produced in the fulness of time, as the work of creation required a more perfect tool, and to have ameliorated his condition, only as the work to be performed became more complicated and varied, just as in the hands of man, the rougher tool is employed for felling, and the finer tool for finishing and polishing.

By this view we come to look upon even the most barbarous state of man's existence, as a condition, not so much of degradation, as of arrested or retarded progress, and to see that, notwithstanding many halts and relapses, and a very varied rate of movement in the different races, the march of the human intellect has been always onward.

As in the lower creation, we find no individuals that are capable of self-improvement, though some appear, by their imitative faculties, to contain within them the germs of an improving element, so the aboriginal man, closely resembling the brutes, may have passed through many generations before he began to show even the first symptoms of mental cultivation, or the rudiments of the simplest arts; and even then his progress may have been, at first, so slow, that it is not without an effort of imagination that the civilized races of our day can realise, by means of the implements which he has left us, the minute gradations which appear to mark the stages of his advancement. This appears to be the view taken by Sir Charles Lyell in his "*Antiquity of Man*," when, in comparing the flint implements found in the higher and lower level gravels of the valley of the Somme, he arrives at the conclusion, "that the state of the arts in those early times remained stationary for an almost indefinite period." "We see," he says, "in our time, that the rate of progress in the arts and sciences proceeds in a geometrical ratio as knowledge increases, and so, when we carry back our retrospect into the past, we must be prepared to find the signs of retardation augmenting in a like geometrical ratio. So that the progress of a thousand years, at a remote period, may correspond to that of a century in modern times, and in ages still more remote, man would more and more resemble the brutes in that attribute which causes one generation exactly to imitate, in all things, the generation which preceded it."

In order to understand the relationship which the savage tribes of our own time bear to the races of antiquity, it is necessary to keep in view that, neither in historic nor pre-historic times is there any evidence that civilization has been equally or universally distributed; on the contrary, it appears always to have been partial, and confined to particular races, whose function it has been by means of war and conquest, to spread the arts amongst surrounding nations, or to exterminate those whose low state of mental culture rendered them incapable of receiving it.

Assuming the whole of the human species to have sprung originally from one stock, an hypothesis which, although disputed, appears to me by all existing evidence and analogy of known facts, to be the most reasonable assumption, the several races appear to have branched off at various and remote periods, many of them, perhaps, previously to the present geographical arrangement of land and water, and to have located themselves in the several regions in which they are now found, in a state which probably differs but little from that in which they existed at the time of their separation from the parent stem.

Each race, after separation, shows evidence of arrested growth; and, finally, the intellect of the nation fossilizes and becomes stationary for an indefinite period, or until destroyed by being brought again in contact with the leading races in an advanced stage of civilization, precisely in the same way that the individuals composing these races, after propagating their species, stagnate, and ultimately decay, or, in a low state of savagery, are often destroyed by their own offspring.

Taking a comprehensive view of the development of civilization, it may be compared to the growth of those plants whose vigour displays itself chiefly in the propagation of their leading shoots, which, overtopping the older and feebler branches, cause them to be everywhere replaced by a fresh growth of verdure. The vegetable kingdom thus furnishes us with the grand type of progress; continuity and bifurcation are principles of universal application, uniting the lowest with the highest created thing.

The analogy of tree growth has been frequently employed in relation to natural phenomena, and it may very well be taken to explain the distribution of the human race, and the progress and expansion of the arts. It forms the key to the Darwinian theory of natural selection, which is essentially monogenistic in its application to the origin of the human race.

Thus the existing races of mankind may be taken to represent the budding twigs and foliage, each in accordance with the relative superiority of its civilization, appertaining to branches higher and higher, placed upon the great stem of life.

So little is as yet known of the early history of any but our own family of nations, that in the existing state of knowledge, the attempt to classify and place them on their proper branches, must be attended with much difficulty, and great liability to error. However, by arranging the existing races according to their civilization, a tolerably correct judgment may perhaps be formed as to the value of this system of classification, if we distribute them with those of antiquity in some

two or three broad divisions. The Caucasian races of modern Europe, for example, may be said to bear to their ancestors of the historical period the same relationship that geologists have shown the existing mammalia of our forests bear to the mammalia of the tertiary geological period. The semi-civilized Chinese and Hindoos, in like manner, may be classed with the races of ancient Assyria, Egypt, and other nations immediately prior to the first dawn of history, the civilization of which nations they still so greatly resemble, and appear to have retained, in a state of retarded progress from those ages to our own. A third division may perhaps be made of the Malay, Tartar, and African negro nations, which though now in an age of iron, may, by the state of their arts, and more especially by the form of their implements, be taken as the best representatives of the pre-historic bronze period of Europe, towards which they appear to hold the same relationship that the fish and reptiles of our seas bear to those of the secondary geological period. In a fourth division may be included the still more barbarous races of our times, the Australian, Bushman, and hunting races of America, whose analogy to those of the stone age of Europe may be typified by that of the mollusca of recent species to the mollusca of the primary geological period.

In all these existing races, we find that the slowness of their progression and incapacity for improvement is proportioned to the low state of their civilisation, thereby leading to the supposition that they may have retained their arts with but slight modification from the time of their branching from the parent stem, and may thus be taken as the living representatives of our common ancestors in the various successive stages of their advancement.

Many examples of this immobility on the part of savages and semi-civilized races may be given.

Throughout the entire continent of Australia the weapons and implements are alike, and of the simplest form, and the people are of the lowest grade. The spear, the waddy, and the boomerang, with some stone hatchets, are their only weapons; but amongst these it has been noticed that, like the implements of the drift, there are minute differences, scarcely apparent to Europeans, but which enable a native to determine at a glance to what tribe a weapon belongs.* This, whilst it proves a tendency to vary their forms, shows at the same time either an incapacity or, what answers the same purpose, a retarding power or prejudice, which prevents their effecting more than the smallest appreciable degree of change. In the island of Tahiti, Captain Cook was unable to make the natives (a superior race to the Australians) appreciate the uses of metal, until he had caused his armourer to construct an iron adze (Plate I, fig. 1 *a*) of precisely the same form as their own adzes of basalt (Fig. 1 *b*).† After that, metal tools came into general use amongst them, though their old forms are in a great measure preserved to this day. When during the American

* A. Oldfield on the Aborigines of Australia. Trans. Ethno. Soc., vol. iii, p. 261, 267.

† See the figures in Meyrick's *Antiquities of New Zealand*.

war, the English endeavoured to utilise the Indians by arming them, they were compelled to construct for them tomahawks after their own pattern, having a pipe in the handle (Fig. 2). When the Purus Indians of South America receive a knife from Europeans they break off the handle, and fashion the knife according to their own ideas, placing the blade between two pieces of wood, and binding it round tight with a sinew.* The natives of Samoa now use iron adzes, constructed after the exact pattern of their ancient stone ones.† The Fije Islanders, though they have now the means of obtaining good blades and chisels from Sheffield, and axes from America, prefer plane irons to any other form of implement, because they are able to fix them by lashing them on to their handles in the same fashion as the ancient stone adzes of their own manufacture, which they resemble.‡ The Andaman Islanders use the European metal that falls into their hands, only to grind it down into spear- and arrow-heads of the same form as their stone ones. The same applies to the whole of the Aborigines of North and South America, which have stood by, for nearly three centuries, passive spectators of the arts of Europeans, without attempting to copy them. Mr. Crawford, in his history of the Indian Archipelago, comments on the obstinate adherence of the Javanese to ancient customs, in accounting for the kris having been retained by them long after the causes which produced that peculiar weapon had ceased to operate. Tylor, in his account of the Anahuac, observes upon the preservation of old types amongst the present inhabitants of Mexico, which have remained almost unchanged from generation to generation, enabling the historian to distinguish clearly those which are of Aztec from those which are of Spanish origin.§ Herodotus describes the spears carried by the Ethiopians in the army of Xerxes as being armed with the sharpened horn of the antelope.|| Consul Petherick found still in use by the Djibba negroes more than two thousand years after, these identical spears, armed with the straightened and sharpened horn of the antelope, and their other weapons also resembled in character those described by Herodotus, although they had passed from the stone weapons then used, into an age of metal.¶ The Scythian bow (Fig. 3) is the bow still used by the whole of the Tartar races (Fig. 4). The Celt of the Tartar, and the Celt and sword of the Negro (Fig. 5) is still the Celt and sword of the European bronze period (Fig. 6), and this resemblance is not confined to the general outline of the weapons, but extends to the style and patterns of ornamentation. The same identity of form exists between the Manillas (Fig. 7) used as a medium of exchange in the Eboe country of West Africa and the so-called penanular rings or ring money (Fig. 8) of gold and bronze that are found in Ireland, and which, with some modifications, belong also to Germany and the

* Klemm-Werkzeuge und Waffen, p. 159.

† Turner, Nineteen Years in Polynesia, p. 262.

‡ Fije and the Fijians, p. 78.

§ Anahuac, by E. B. Tylor, p. 70.

|| Rawlinson's Herodotus, vol. iv, p. 69.

¶ Petherick's Travels, p. 360.

Swiss Lakes. The corrugated iron blade of the Kaffir assegai, a section of which is shown in Fig. 9, and which is used also in Central and West Africa, is identical with those found in the Saxon graves (Fig 10), and is intended to give a spiral motion to these missiles. Chevalier Follard observes that the Gauls were remarkable for the tenacity with which they clung to their ancient customs, while the Romans, their conquerors, are mentioned by all historians as peculiar in their time for the facility with which they adopted the customs of others, and developed their own. In modern Europe, the Gypsies have also been noticed as being distinguished from the Europeans in all the various localities in which they are found, for their remarkable adherence to especial arts, savouring of an extinct civilization. Amongst the Chinese and Hindoos, the conservatism which has caused them to remain for ages in nearly the same condition is too well known to require comment. It will, however, be remembered, in illustration of the fact, that customs of minor importance often survive great political changes, and serve to keep up the continuity that would otherwise be broken; that after the Manchu Tartars had conquered and established themselves in the Chinese territory, they were nearly driven again from the country, on account of their forcing upon the subject people, the custom of wearing pigtails, after the fashion of their conquerors, showing how difficult it is to ingraft upon an alien race, customs that are not indigenous.

These, and many other notices of a similar character that are to be found in the pages of travel, establish it as a maxim, that the existing races, in their respective stages of progression, may be taken as the *bonâ fide* representatives of the races of antiquity; and, marvellous as it may appear to us in these days of rapid progress, their habits and arts, even to the form of their rudest weapons, have continued in many cases, with but slight modifications, unchanged throughout countless ages, and from periods long prior to the commencement of history. They thus afford us living illustrations of the social customs, the forms of government, laws, and warlike practices, which belonged to the ancient races from which they remotely sprung, whose implements, resembling, with but little difference, their own, are now found low down in the soil, in situations, and under circumstances in which, alone, they would convey but little evidence to the antiquary, but which, when the investigations of the antiquary are interpreted by those of the ethnologist, are teeming with interesting revelations respecting the past history of our race, and which, in the hands of the anthropologist, in whose science that of antiquity and ethnology are combined with physiology and geology, is no doubt destined to throw a flood of light, if not eventually, in a great measure, to clear up the mystery which now hangs over everything connected with the origin of mankind.

That such a combination of the sciences should have been brought about so opportunely in our days, appears to me to be one of those many indications of an overruling power directing in the aggregate the minds of men, and which must, at all times, strike even the most superficial observer of nature; for there can be little doubt that in a few

years all the most barbarous races will have disappeared from the earth, or will have ceased to preserve their native arts.

The law which consigns to destruction all savage races when brought in contact with a civilization much higher than their own, is now operating with unrelenting fury in every part of the world. Of the aborigines of Tasmania, not a single individual remains; those of New Zealand are fast disappearing. The Australian savage dies out before the advancing European. North and South America, and the Polynesian Islands, all tell the same tale. Wherever the generous influences of Christianity have set foot, there they have been accompanied by the scourge. Innumerable, and often unseen causes, combine in effecting the same purpose; diseases which are but little felt by Europeans, act as plagues when introduced into uncivilized communities, and cause them to fall before its ravages, like wheat before the sickle; and the vices of civilization, taking a firmer hold of the savages than its virtues, aid and abet in the same work. The labours of the missionary, if they have produced no other benefit, have been useful in teaching us the great truth, that notwithstanding the philanthropic efforts of the intruding race, the law of nature must be vindicated. The savage is morally and mentally an unfit instrument for the spread of civilization, except when, like the higher mammalia, he is reduced to a state of slavery; his occupation is gone, and his place is required for an improved race. Allowing for the rapidly increasing ratio in which progress advances, it is not too much to assume, that in half a century from the present time, savage life will have ceased to have a single true representative on the face of the globe, and the evidence which it has been the means of handing down to our generation will have perished with it.

When we find that the condition of the aboriginal man must have been one of such complete inanity as to render him incapable of spontaneously initiating even the most rudimentary arts, it follows as a matter of course that in the earliest stages of his career, he must, like children of our own day, have been subject to compulsory instruction. And in looking to nature for the sources from which such early instruction must have been derived, we need not, I think, be long in coming to the conclusion, that the school of our first parents must be sought for in his struggles for mastery with the brute creation, and that, consequently, his first lessons must have been directed to attaining proficiency in the art of war.

Hence it follows that it is to the lower animals that we must look for the origin of all those branches of primitive warfare which it is the object of this lecture to trace out. Nor indeed shall we fail to find abundant evidence that there is hardly a single branch of human industry which may not reasonably be attributed to the same source.

The province of war extends downward through the animal kingdom, shewing unmistakable evidence of its existence in forms offensive and defensive, differing but little from those of the human era, through the unnumbered ages of the geological periods, long prior to man's advent, proving, beyond the possibility of doubt, that from the

remotest age in which we find evidence of organised beings, war has been ordained to an important function in the creative process.

Judging by results, which I apprehend is the only true method of investigating the phenomena of life, three primary instincts appear to have been implanted in nearly all the higher animals: * alimentiveness, for the sustenance of life; amativeness, for the propagation of species; and combativeness, for the protection of species, and the propagation by natural selection of the most energetic breeds; on which latter subject much important information has been given to the world by Mr. Darwin, in his celebrated work on the origin of species.

Much might, I believe, be said on the connection which subsists between these functions, all of which are, in some form or other, necessary to a healthy condition. Suffice, however, to observe, that as regards the dawn of an Utopia, in which some men who think themselves practical, appear to indulge; whether we study the subject by observing the uses to which animals apply the various and ingeniously constructed weapons with which Providence has armed them, or whether we view it in relation to the prodigious armaments of all the most civilised nations of Europe, we find no more evidence in nature, of a state of society in which wars shall cease, than we do of a state of existence in which we shall support life without food, or propagate our species by other means than those which nature has appointed.

The universality of the warlike element is shewn in the fact, that the classification of the weapons of men and animals are identical, and may be treated under the same heads.

Many constructive arts are brought to greater perfection in animals by the development of faculties, especially adapting them to the peculiar implements with which nature has furnished them, than can be attained by man, and especially by the aboriginal man, whose particular attribute appears, by all analogy of savage life, to have been an increase of that imitative faculty which, in the lower creation, is found only in a modified degree in apes.

The lower creation would thus furnish man not only with the first elements of instruction, but with examples for the improvement of the work commenced, or to use the words of Pope:—

- “ From the creatures thy instruction take,
- “ Thy arts of building from the bee receive ;
- “ Learn from the mole to plough, the worm to weave ;
- “ Learn from the little nautilus to sail,
- “ Spread the thin oars, and catch the driving gale ;
- “ Here, too, all forms of social reason find,
- “ And hence let reason late instruct mankind.”†

In the art of war, as we shall see, he would not only derive his first instruction from the beasts, but he would improve his means of offence

* In adopting the nomenclature of phrenology, I am not to be understood as advocating strictly the localization of the faculties which phrenology prescribes. The mind doubtless consists of a co-genesis of faculties, and phrenology affords the best classification of them that has yet been devised.

† Pope's Essay on Man, epistle iii.

and defence from time to time by lessons derived from the same source.

It therefore appears desirable that, before entering upon that branch of the subject which relates to the *progress and development* of the art of war, I should point out briefly the analogies which exist between the weapons, tactics, and stratagems of savages and those of the lower creation, and shew to what extent man appears to have availed himself of the weapons of animals for his own defence.

In so doing the subject may be classified as follows :—

Classification of the Weapons of Animals and Savages.

Defensive.	Offensive.	Stratagems.
Hides.	Piercing.	Flight.
Solid plates.	Striking.	Concealment.
Jointed plates.	Serrated.	Tactics.
Scales.	Poisoned.	Columns.
	Missiles.	Leaders.
		Outposts.
		Artificial defences.
		War cries.

Firstly, with respect to the combative principle itself. The identity of this instinct in men and animals may be seen in the widely-spread custom of bating animals against each other, a practice which is not derived from any one source, but is indigenous in the countries in which it prevails, and arises from the inherent sympathy which exists between men and animals in the exercise of this particular function.

In the island of Tahiti, long before the first European vessel was seen off their shores, the inhabitants were accustomed to train and fight cocks, which were fed with great care, and kept upon finely-carved perches.* Cock-fighting also prevails amongst the Malays, Celebes, and Balinese. The Javanese fight their cocks like the Mohammedans of Hindustan, without spurs; the Malays, Bugis, and Macassars with artificial spurs shaped like a scythe.† It also prevails in Central Africa, Central America, and Peru. The Sumatrans fight their cocks for vast sums; a man has been known to stake his wife and children, son, mother, or sister on the issue of a battle, and when a dispute occurs, the owners decide the question by an appeal to the sword. In like manner Adrastus, the son of Midas, King of Phrygia, is said to have killed his brother in consequence of a quarrel which took place between them in regard to a battle of quails.

When Themistocles led the Greeks out against the Persians, happening to see two cocks fight, he shewed them as an example to his soldiers. Cock-fighting was afterwards exhibited annually in presence

* Ellis's Polynesian Researches, vol. 1, p. 222.

† Crawford's Indian Archipelago, vol. 1, p. 116.

of the whole people, and the crowing of a cock was ever after regarded as a presage of victory.*

The Javanese also fight hogs and rams together. The buffalo and tiger are matched against each other. In Butan the combat is between two bulls. Combats of elephants took place for the amusement of the early Indian kings. The Chinese and Javanese fight quails, crickets, and fish. The Romans fought cocks, quails, and partridges, also the rhinoceros. In Stamboul two rams are employed for fighting. The Russians fight geese, and the betting runs very high upon them.† We find horses, elephants, and oxen standing side by side with man in hostile array, and dogs were used by the Gauls for the same purpose. Amongst the ancients, the horse, the wolf, and the cock were offered on the altar of Mars for their warlike qualities.

Who can doubt with these examples before us, that an instinct so widely disseminated and so identical in men and animals, must have been ordained for special objects?

The causes which give rise to the exercise of the function, vary with the advance of civilization. We have now ceased to take delight in the mere exhibition of brute combats, but the profession of war is still held in as much esteem as at any previous period in the history of mankind, and we bestow the highest honours of the State upon successful combatants.

This however leads to another subject, viz., the causes of war amongst primitive races which is deserving of separate treatment.

Defensive Weapons.

We may pass briefly over the defensive weapons of animals and savages, not by any means from the analogy being less perfect in this class of weapons, but rather because the similarity is too obvious to make it necessary that much stress should be laid on their resemblance.

Hides.—The thick hides of pachydermatous animals, correspond to the quilted armour of ancient and semi-civilized races. Some animals like the rhinoceros and hippopotamus are entirely armed in this way, others, have their defences on the most vulnerable part, as the mane of the lion, and the shoulder pad of the boar.‡ The skin of the tiger is of so tough and yielding a nature, as to resist the horn of the buffalo when driven with full force against its sides.§ The condor of Peru has such a thick coating of feathers, that eight or ten bullets may strike without piercing it.||

According to Thucydides, the Locrians and Acarnanians, being professed thieves and robbers, were the first to clothe themselves in armour. But as a general rule it may be said, that the opinions of

* Beckman's History of Inventions—Cock-fighting.

† Stanley's History of Birds, p. 361.

‡ Darwin, Origin of Species, p. 88.

§ Williamson's Field Sports.

|| Swainson's Habits and Instincts of Animals.

ancient writers upon the origin of the customs with which they were familiar, are of little value in our days. There is however evidence to show, that the use of defensive armour is not usual amongst savages in the lowest stages of culture. It is not employed, properly speaking, by the Australians, the Bushmen, the Fingians, in the Fije or Sandwich Islands. But in many other parts of the world, soon after men began to clothe themselves in the skins of beasts, they appear to have used the thicker hides of animals for purposes of defence. When the Esquimaux apprehends hostility, he takes off his ordinary shirt, and puts on a deer's skin, tanned in such a manner as to render it thick for defence, and over this he again draws his ordinary shirt, which is also of deer-skin, but thinner in substance. The Esquimaux also use armour of eider drake's skin.* The Abipones and Indians of the Gran Chako, arm themselves with a cuirass, greaves, and helmet, composed of the thick hide of the tapir, but they no longer use it against the musketry of the Europeans. The Yncanas also use shields of the same material. The war dress of a Patagonian chief from the Museum of the Institution is exhibited (Plate II, figs. 11, 12); it is composed of seven thicknesses of hide, probably of the horse, upon the body, and three on the sleeves. The chiefs of the Masgu negroes of Central Africa, use for defence a strong doublet of the same kind, made of buffalo's hide with the hair inside.† The Kyans of Borneo use hide for their war dress as shown by a specimen belonging to the Institution (Fig. 13). The skin of the bear and panther is most esteemed for this purpose.‡ The inhabitants of Pulo Nias, an island off the western coast of Sumatra, use for armour a baju made of leather.§ In some parts of Egypt a breast plate was made of the back of the crocodile (Fig. 14). In the island of Cayenne, in 1519, the inhabitants used a breast plate of buffalo's hide.|| The Lesghi of Tartary wore armour of hog's skin.¶ The Indians of Chili, in the 17th century, wore corselets, back and breast-plates, gauntlets, and helmets of leather, so hardened, that it is decreed by Ovalle as being equal to metal.** According to Strabo, the German Rhoxolani wore collars, helmets, and shields of bull's hide, though the Germans generally, placed little reliance in defensive armour. The Ethiopians used the skins of cranes and ostriches for their armour.††

We learn from Herodotus that it was from the Lybians, the Greeks derived the apparel and ægis of Minerva, as represented upon her images, but instead of a pectoral of scale armour, that of the Lybians was merely of skin.‡‡ According to Smith's dictionary of Greek and

* Beechey's Voyage to the Pacific, vol. i, p. 248.

† Barth, vol. iii.

‡ Sarawak, by Hugh Low, Esq., Colonial Secretary at Labuan, 1848.

§ Dobrizhoffer.

|| Pigafetta's Voyage Round the World. Pinkerton, vol. ix, p. 349.

¶ Travels of William de Rubriques into Tartary and China in 1253; Pinkerton, vol. viii, p. 89.

** An Historical relation of the Kingdom of Chile, by Alonso de Ovalle, of the Company of Jesus, 1649.

†† Herodotus; Meyrick's Ancient Armour.

‡‡ Meyrick's Ancient Armour, vol. i, pl. iv.

Roman Antiquities, the Greek thorax, called *σραδιος*, from its standing erect by its own stiffness, was originally of leather, before it was constructed of metal. In Meyrick's Ancient Armour, there is the figure of a suit, supposed formerly to have belonged to the Rajah of Guzerat (Plate III, fig. 15). The body part of this suit is composed of four pieces of rhinoceros hide, showing that, in all probability, this was the material originally employed for that particular class of armour, which is now produced of the same form in metal, a specimen of which, from the Museum of the Institution, taken from the Sikhs, is now exhibited (Fig. 16).

In more advanced communities, as skins began to be replaced by woven materials, quilted armour supplid the place of hides. In those parts of the Polynesian Islands, in which armour is used, owing probably to the absence of suitable skins, woven armour appears to have been employed in a comparatively low state of society. Specimens of this class of armour from the Museum of the Institution are exhibited; they are from the King's Mill, Pleasant Island, and the Sandwich Islands. A helmet from the latter place (Fig. 17) much resembles the Grecian in form, while the under tippet, from Pleasant Island (Plate II, fig. 18), may be compared to the pectoral of the Egyptians (Fig. 19, *a* and *b*), which, as well as the head dress (Plate III, fig. 20), was of a thickly quilted material. The Egyptians wore this pectoral up to the time of Xerxes, who employed their sailors, armed in this way, during his expedition into Greece. Herodotus says that the Indians of Asia wore a thorax of rush matting. In 1514, Magellan* found tunics of quilted cotton, called *landes*, in use by the Muslims of Guzerat and the Deccan. An Indian helmet of this description from my collection (Fig. 21) is exhibited; in form it resembles the Egyptian, and an Ethiopian one (Fig. 22), composed of beads of the same form, brought from Central Africa by Consul Petherick is exhibited. Fig. 23 shows that the same form, in India, was subsequently produced in metal. A suit of quilted armour formerly belonging to Koer Singh, and lately presented to the Institution by Sir Vincent Eyre is also exhibited (Plate II, fig. 24). The body armour and helmet found upon Tippoo Saib at his death, and which is now in the Museum of the Institution (Plate IV, fig. 25, *a*, *b*, and *c*), was thickly quilted. Upon the breast, this armour consists of two sheets of parchment, and nine thicknesses of padding composed of cocoons of the *Saturnia mylitta*, stuffed with the wool of the *Eriodendron anfractuosum*, D. C., neatly sewn together, as represented in Fig. 25 *b*.† The Aztecs and Peruvians also guarded themselves with

* The Coasts of East Africa and Malabar, by Duarte Barbosa, translated from the Spanish, by the Hon. H. E. Stanley, for the Hakluyt Society. Since publication, the translator has ascertained that the authorship of this work should be ascribed to Magellan.

† The *Saturnia mylitta* is the caterpillar from which the Tusseh-silk is obtained, the cocoon is of an oval shape when suspended upon the tree, and of exceedingly firm texture, it is figured in Sir Wm. Jardine's Naturalist's Library, vol. xxxii. The *Eriodendron anfractuosum*, D. C., is an Indian Bombax. The woolly cotton which envelopes the seed is remarkable for its softness, and is much and deservedly esteemed for making cushions and bedding, owing to its freedom from any tendency to become lumpy and uneven by getting impacted into hard knots. Various

a wadded cotton doublet.* Quilted armour or thick linen corselets were used by the Persians, Phœnicians, Chalibes, Assyrians, Lusitanians, and Scythians, by the Greeks, and occasionally by the Romans. By the Persians it was used much later; and in Africa to this day, quilted armour, of precisely the same description, is used both for men and horses by the Bornonese of Central Africa, and is described by Denham and Clapperton (Plate III, fig. 26). Plate II, fig. 27 is a suit of armour in the Institution, from the Navigator's Islands, composed of cocoa-nut fibre coarsely netted. Fig. 28 is part of a Chinese jacket of sky-blue cotton, quilted with enclosed plates of iron, it is precisely similar to the Brigandine jacket used in Europe in the 16th century, which was composed of "small plates of iron quilted within some stuff, and "covered generally with sky-blue cloth."† This class of armour may be regarded as a link connecting the quilted, with the scale armour, to be described hereafter.

As a material for shields, the hides of animals were employed even more universally, and up to a later stage of civilization. In North America, the majority of the wild tribes use shields of the thickest parts of the hides of the buffalo.‡ In the New Hebrides, the skin of the alligator is used for this purpose, as appears by a specimen belonging to the Institution. In Africa, the Faus of the Gaboon employ the hide of the elephant for their large rectangular shields.§ The Wadi, the Wagogo, and the Abyssinians in East Africa, have shields of buffalo's hide, or some kind of leather, like the Ethiopians of the time of Herodotus. The ox-hide shields of the Greeks are mentioned in Homer's Iliad; that of Ajax was composed of seven hides with a coating of brass on the outside. The spear of Hector is described as piercing six of the hides and the brass coating, remaining fixed in the seventh hide.|| The Caffres, Bechuanas, Bassutos, and others in South Africa, use the hide of the ox.¶ The Kelgeres, Kelowi, and Tawarek, of Central Africa, employ the hide of the Leucoryx antelope.** Shields of the rhinoceros hide, from Nubia, and of the ox, from Fernando Po, are exhibited. In Asia, the Biluchi carry shields of the rhinoceros horn, and the same material is also used in East Africa.†† A specimen from Zanzibar is in the Institution. In the greater part of India, the shields are made of rhinoceros and buffalo's

attempts have been made to fabricate it into cloth, but hitherto without success, except as a very loose material, fit only for quilting muffs, for which it is superior to cotton or woollen stuffs, the looseness of its texture rendering it an excellent non-conductor, whilst at the same time it is extremely light.—Illustrations of Indian Botany, by Robert Wight, M.D., F.L.S., vol. 1, p. 68.—Flora Indica.—Roxburgh, vol. iii, p. 169. Both the caterpillar and the plant are found in the jungle in the neighbourhood of Seringapatam. For the identification of the vegetable substance, I am indebted to W. Carruthers, Esq., F.L.S., British Museum.

* Schoolcraft.—Meyrick.

† See Critical Enquiry into Ancient Armour, by Sir Samuel R. Meyrick, vol. iii, p. 21, and pl. lxxviii.

‡ Bollaert, Indians of Texas, Trans. Ethno. Soc., vol. 1-2.

§ Du Chaillu, p. 79, 80.

|| Iliad, vii.

** Barth, vol. i.

¶ Cassalis.

†† Meyrick, pl. cxlvii.

hide, boiled in oil, until they sometimes become transparent, and are proof against the edge of a sabre.*

In a higher state of civilization, as the facilities for constructing shields of improved materials increased, the skins of animals were still used to cover the outside. Thus the negroes of the Gold Coast made their shields of osier covered with leather.† That of the Kanembu of Central Africa is of wood covered with leather,‡ and very much resembles in form that of the Egyptians, which, as we learn from Meyrick and others, was also covered with leather, having the hair on the outside like the shields of the Greeks.§ The Roman scutum was of wood covered with linen and sheepskin. According to the author of "Horæ Ferales," the Saxon shield was of wood covered with leather; the same applies to the Scotch target, and leather was used as a covering for shields, as late as the time of Henry VIII.

Heal Crests.—The origin of the hairy crests of our helmets, is clearly traceable to the custom of wearing for head-dresses the heads and hair of animals. The Asiatic Ethiopians used as a head-covering, the skin of a horse's head, stripped from the carcase together with the ears and mane, and so contrived, that the mane served for a crest, while the ears appeared erect upon the head. In the coins representing Hercules, he appears wearing a lion's skin upon the head. These skins were worn in such a manner that the teeth appeared grinning at the enemy over the head of the wearer, as represented in Plate III, fig. 29, which is taken from a bronze in the Blacas collection, a custom which seems also to have prevailed in Mexico.|| Similar head-dresses are worn by the soldiers on Trajan's column. The horns worn on the heads of some of the North American Indians (Fig. 30), and in some parts of Africa,¶ are no doubt derived from this practice of wearing on the head, the skins of animals with their appendages. The helmet of Pyrrhus, King of Epirus, was surmounted by two goat's horns. Horns were afterwards represented in brass, on the helmets of the Thracians (Fig. 31), the Belgic Gauls, and others. Fig. 32 is an ancient British helmet of bronze lately found in the Thames, surmounted by straight horns of the same material.** Horned heliæts are figured on the ancient vases. Fig. 33 is a Greek helmet having horns of brass, and traces of the same custom may still be observed in heraldry.††

The practice of wearing head-dresses of feathers, to distinguish the chiefs from the rank and file, is universal in all parts of the world, and in nearly every stage of civilization. Amongst the North American Indians, the feathers are cut in a particular manner to denote the rank of the wearer, precisely in the same manner that the long feathers of

* Meyrick's Engraved Illustrations of Ancient Armour, by J. Skelton, F.S.A., vol. ii, pl. cxli.

† Bosman's Guinea, Pinkerton, vol. xii, p. 413.

‡ Barth, Denham and Clapperton.

§ Meyrick, vol. i, p. 111.

|| Meyrick, vol. i, p. 20.

¶ At Fernando Po.—Cuming on Weapons and Armour of Horn, Journal of the Archaeological Association, vol. iii.

** Fig. 32 is from a rough sketch taken about two years ago, and has no pretension to accuracy of detail.

†† Meyrick, vol. i, pl. iv.

our general officers distinguish them from those wearing shorter feathers in subordinate ranks. This custom, Mr. Schoolcraft observes, when describing the head-dresses of the American Indians, may very probably be derived from the feathered creation, in which the males, in most of the cock, turkey, and pheasant tribes, are crowned with bright crests and ornaments of feathers.

Solid Plates.—It has often struck me as remarkable that the shells of the tortoise and turtle, which are so widely distributed and so easily captured, and which would appear to furnish shields ready made to the hand of man, should seldom, if ever, in so far as I have been able to learn, be used by savages for that purpose. This may, however, be accounted for by the fact that *broad* shields of that particular form, though common in more advanced civilizations, are never found in the hands of savages, at least in those localities in which the turtle, or large tortoise, is available.

It will be seen subsequently, in tracing the history of the shield, that in the rudest condition of savage life, this weapon of defence has a history of its own; that both in Africa and Australia, it is derived by successive stages from the stick or club, and the broad shield does not appear to have been developed until after mankind had acquired sufficient constructive skill to have been able to form shields of lighter and more suitable materials than is afforded by the shell of the turtle. It is, however, evident that in later times, the analogy was not lost sight of, as the word *testudo* is a name given by the Romans to several engines of war having shields attached to them, and especially to that particular formation of the legionary troops, in which they approached a fortified building with their shields joined together, and overlapping, like the scaly shell of the imbricated turtle, which is a native of the Mediterranean and Asiatic seas.

Jointed Plates.—In speaking of the jointed plates, so common to all the crustacea, it is sufficient to notice that this class of defence in the animal kingdom, may be regarded as the prototype of that peculiar form of armour which was used by the Romans, and to which the French, at the commencement of the 17th century, gave the name of “*écrevisses*,” from its resemblance to the shell of a lobster. The fluted armour, common in Persia, and, in the middle ages, of Europe, is also constructed in exact imitation of the corrugated shell defences of a large class of the Mollusca.

Scale armour.—That scale armour derived its origin from the scales of animals, there can be little doubt. It has been stated on the authority of Arrian, that the Greeks distinguished scale armour by the term *λεπιδωτός*, expressive of its resemblance to the scales of fish whilst the jointed armour, composed of long flexible bands, like the armour of the Roman soldier, and the *écrevisses* of the middle ages was called *φολιδωτός* from its resemblance to the scales of serpents. The brute origin of scale armour is well illustrated by the breast plate of the Bugo Dyaks, a specimen of which, from the Museum of the Institution, is exhibited (Plate IV, fig. 34). The process of its construction was described in a notice attached to a specimen of this armour in the Exhibition of 1862. The scales of the Pangolin are collected by the Bugis

as they are thrown off by the animal, and are stitched on to bark with small threads of cane, so as to overlap each other in the same manner that they are arranged on the skin of the animal. When the front piece is completely covered with scales, a hole is cut in the bark for the head of the wearer. The specimen now exhibited appears, however, to be composed of the entire skin of the animal. Captain Grant, in his "Walk across Africa," mentions that the scales of the armadillo are in like manner collected by the negroes of East Africa, and worn in a belt "three inches across," as a charm.*

It is reasonable to suppose that the use of scale armour, in most countries, originated in this manner by sewing on to the quilted armour before described, fragments of any hard material calculated to give it additional strength. Plate III, fig. 35 is a piece of bark from Tahiti, studded with pieces of cocoa-nut stitched on. The Sarmatians and Quadi are described by Ammianus Marcellinus as being protected by a lorica, composed of pieces of horn, planed and polished, and fastened like feathers upon a linen shirt.† Pausanias also, who is confirmed by Tacitus, says that the Sarmatians had large herds of horses, that they collected the hoofs, and after preparing them for the purpose, sewed them together, with the nerves and sinews of the same animal, so as to overlap each other like the surface of a fir cone, and he adds, that the lorica thus formed was not inferior to that of the Greeks either in strength or elegance. The Emperor Domitian had, after this model, a cuirass of boar's hoofs stitched together.‡ Fig. 36 represents a fragment of scale armour made of horn found at Pompeii. A very similar piece of armour (Fig. 37), from some part of Asia, said to be from Japan, but the actual locality of which is not known, is figured in Meyrick's Ancient Armour, Pl. III. It is made of the hoofs of some animal, stitched and fastened so as to hold together without the aid of a linen corselet. An ancient stone figure§ (Plate IV, fig. 38), having an inscription in a character cognate to the Greek, but in an unknown language, and covered with armour of this description, is represented in the third volume of the Journal of the Archaeological Association. The Kians inhabiting the eastern coast of Borneo, form a kind of armour composed of little shells placed one overlapping the other, like scales, and having a large mother-of-pearl shell at the end. This last portion of the armour is shown in the figure of the Kian wardress already referred to (Fig. 13). Plate III, fig. 39 is a back- and breast-piece of armour from the Sandwich Islands, composed of seals' teeth, set like scales, and united with string.

Similar scales would afterwards be constructed in bronze and iron. It was thus employed by the Egyptians (Plate IV, fig. 40), two scales of which are shown in Fig. 41; also by the Persians, Assyrians, Philistines, Dacians, and most ancient nations.

The armour of Goliath is believed to have been of scales, from the fact of the word "kaskassim," used in the text of I Samuel, xvii.

* Walk across Africa, p. 47.

† Smith's Dictionary—Meyrick's Ancient Armour, pl. iii.

‡ Pictorial Bible, note to I Samuel, chap. xvii.

§ Cumming—Journal of the Archaeological Association, vol. iii.

being the same employed in Leviticus and Ezekiel, to express the scales of fish.* Amongst the Romans, scale armour was regarded as characteristic of barbarians, but they appear to have adopted it in the time of the Emperors. A suit of Japanese armour in my collection shows four distinct systems of defence, the back and breast being of solid plates, the sleeves and leggings composed of small pieces of iron, stitched on to cloth, and united with chain, whilst other portions are quilted with enclosed pieces of iron (Fig. 42, *a* and *b*). Fig. 43, *a* and *b*, is a suit of Chinese armour, in the Museum, having large iron scales on the inside (Fig. 44). This system was also employed in Europe. Fig. 45 is the inner side of a suit of Jazerine armour of the 15th or 16th century, in my collection. Fig. 46 represents a similar suit in the Museum of the Institution, probably of the same date, having large scales of iron on the outside. A last vestige of scale armour may be seen in the dress of the Albanians which, like the Scotch and ancient Irish kilt, and that formerly worn by the Maltese peasantry, is a relic of costume of the Greek and Roman age. In the Albanian jacket the scales are still represented in gold embroidery.†

Offensive Weapons of Men and Animals.

Piercing Weapons.—The Gnu of South Africa, when pressed, will attack men, bending its head downwards, so as to pierce with the point of its horn.‡ The same applies to many of the antelope tribe. The rhinoceros destroys the elephant with the thrust of its horn, ripping up the belly (Plate V. fig. 47). The horn rests on a strong arch formed by the nasal bones; those of the African rhinoceros, two in number, are fixed to the nose by a strong apparatus of muscles and tendons, so that they are loose when the animal is in a quiescent state, but become firm and immovable when he is enraged, showing in an especial manner that this apparatus is destined for warlike purposes.§ It is capable of piercing the ribs of a horse, passing through saddle, padding, and all.|| Mr. Atkinson, in his *Siberian Travels*, speaks of the tusk of the wild boar, which in those parts is long, and as sharp as a knife, and he describes the death of a horse which was killed by a single stroke from this animal, delivered in the chest.¶ The buffalo charges at full speed with its horn down.** The bittern, with its beak, aims always at the eye.†† The walrus (Fig. 48) attacks fiercely with its

* Pictorial Bible, note to 1 Samuel xvii.

† Skene on the Albanians, vol. i-ii—*Ethnological Journal*.

‡ Cassalis, *Account of the Bassutos*, p. 172

§ *Maunder's Treasury of Natural History*.

|| *Williamson's Field Sports*, vol. i, p. 174.

¶ *Atkinson's Travels in Siberia*, p. 495.

** *Williamson's Field Sports*.

†† *Thompson's Passions of Animals*, p. 225. The American hunter avails himself of this peculiarity to entrap the crane by presenting the barrel of his firelock to the animal; supposing it to be an eye, the crane immediately strikes at the hole, and fixes its beak firmly in the muzzle.

pointed tusks, and will attempt to pierce the side of a boat with them.* The needle fish of the Amazons is armed with a long pointed lance.† The same applies to the sword-fish of the Mediterranean and Atlantic (Fig. 49), which, notwithstanding its food is mostly vegetable, attacks the whale with its spear point on all occasions of meeting. There is an instance on record of a man, whilst bathing in the Severn near Worcester, having been killed by the sword-fish.

The weapon of the sword-fish is used as a spear-head by the wild tribes of Cambodia, and some idea may be formed of its efficiency for this purpose, and of the confidence with which it is used, by the following account of an attack on a rhinoceros with this weapon, by Mons. Mouhot.‡ He says:—

“The manner in which the rhinoceros is hunted by the Laotians is curious, on account of its simplicity and the skill they display. They had bamboos, with iron blades, something between a bayonet and a poignard. The weapon of the chief was the horn of a sword-fish, long, sharp, strong, supple, and not likely to break. Thus armed, we set off into the thickest part of the forest, with all the windings of which our leader was familiar, and could tell with tolerable certainty where we should find our expected prey. After penetrating nearly two miles into the forest, we suddenly heard the crackling of branches, and rustling of the dry leaves. The chief went on in advance, signing to us to keep a little way behind, but to have our arms in readiness. Soon our leader uttered a shrill cry, as a token that the animal was near. He then commenced striking against each other two bamboo canes, and the men set up wild yells to provoke the animal to quit his retreat.

“A few minutes only elapsed before he rushed towards us, furious at having been disturbed. He was a rhinoceros of the largest size, and opened a most enormous mouth. Without any sign of fear, but on the contrary of great exultation, as if sure of his prey, the intrepid hunter advanced, lance in hand, and then stood still waiting for the creature’s assault. I must say I trembled for him, and loaded my gun with two balls; but when the rhinoceros came within reach, and opened his immense jaws to seize his enemy,§ the hunter thrust his lance into him to a depth of some feet, and calmly retired to where we were posted.” After the animal was dead, the chief withdrew his sword-fish blade, and presented it to Mons. Mouhot.

The narwhal has a still more formidable weapon of the same kind (Fig. 50). It attacks the whale, and occasionally the bottoms of ships a specimen of the effect of which attack, from the Museum of the Institution, is now exhibited (Fig. 51). The Esquimaux, who, in the accounts of which they give of their own customs, profess to derive much experience from the habits of the animals amongst which they live, use the narwhal’s tusk for the points of their spears. Fig. 52

* Beechey’s Voyage to the North Pole, p. 91, 94.

† Bates—Naturalist on the Amazons, vol. ii, 141.

‡ Travels in the Central parts of Indo-China, Siam, Cambodia, and Laos. in 1858–9, by the late M. Henri Mouhot, vol. ii, p. 117.

§ It is to be observed that this is not the rhinoceros’s usual mode of attack.

represents a nungit from Greenland, of the form mentioned by Crantz; it is armed with the point of the narwhal's tusk. Fig. 53, from my collection, has the shaft also of narwhal's tusk; it is armed with a metal blade, but it is introduced here in order to show the association which existed in the mind of the constructor between his weapon and the animal from which the shaft is derived, and for the capture of which it is chiefly used. The wooden shaft, it will be seen, is constructed in the form of the fish, and the ivory fore shaft is inserted in the snout in the exact position of that of the fish itself. At Kotzebue Sound Captain Beechey* found the natives armed with lances composed of a walrus tooth fixed to the end of a wooden staff (Fig. 54). They also employ the walrus tooth for the points of their tomahawks (Fig. 55). The horns of the antelope are used as lance points by the Djibba negroes of Central Africa, as already mentioned, and in Nubia also by the Shillooks and Dinka.† The antelope's horn is also used in South Africa for the same purpose.‡ The argus pheasant of India,§ the wing-wader of Australia,|| and the plover of Central Africa,¶ have spurs on their wings, with which they fight; the cock and turkey have spurs on their feet, used expressly for offence. The white crane of America has been known to drive its beak deep into the bowels of a hunter.** The Indians of Virginia, in 1606, are described as having arrows armed with the spurs of the Turkey, and beaks of birds††. In the Christy collection there is an arrow supposed to be from South America, which is armed with the natural point of the deer's horn (Fig. 56). The war club of the Iroquois, called GA-NE-U-GA-O-DUS-IIA, or "deer-horn war club," was armed with a point of the deer's horn (Fig. 57), about 4 inches in length; since communication with Europeans, a metal point has been substituted (Fig. 58). It appears highly probable that the martel-de-fer of the 15th and 16th centuries, and which is also used in India and Persia, may have been derived, as its form indicates, from a horn weapon of this kind. Horn points suitable for arming such weapons have been found both in England and Ireland, two specimens of which are in my collection.‡‡ The weapon of the sting ray, from the method of using it by the animal itself, should more properly be classed with serrated weapons, but it is a weapon in general use amongst savages for spear or arrow points (Fig. 59), for which it has the particular merit of breaking off in the wound. It causes a frightful wound, and being sharply serrated, as well as pointed, there is no means of cutting it out. It is used in this way

* Beechey's Voyage, p. 252.

† Journal of the Archaeological Association, vol. iii, p. 25.

‡ Ibid. vol. iii, p. 26.

§ Swainson's Habits and Instincts of Animals, p. 141.

|| Gregory's Expedition to the North-west Coast of Australia, vol. 32—Royal Geographical Society's Journal.

¶ Denham and Clapperton's Travels, p. 20.

** Narrative of the Canadian Exploring Expedition, by G. H. Hind, p. 316.

†† Captain John Smith's Sixth Voyage to Virginia in 1606; Pinkerton, vol. xiii, p. 36.

‡‡ See Cuming on Weapons of Horn, Journal of the British Archaeological Association, vol. iii, p. 27.

by the inhabitants of Gambier Island, Samoa,* Otaheite,† the Fije Islands,‡ Pellew Islands,§ and many of the low islands. Amongst the savages of tropical South America, the blade of the ray, probably the trygon histrix, is used for arrow points.||

In the "*Balistes capriscus*" (Fig. 60*a*) a rare British fish, the anterior dorsal, is preceded by a strong erectile spine, which is used for piercing other fishes from beneath. Its base is expanded and perforated, and a bolt from the supporting plate passes freely through it. When this spine is raised, a hollow at the back receives a prominence from the next bony ray, which fixes the spine in an erect position, as the hammer of a gun-lock acts at full cock, and the spine cannot be forced down till this prominence is withdrawn, as by pulling the trigger, "This mechanism may be compared to the fixing and unfixing of a bayonet; when the spine is unfixing and bent down, it is received into a groove on the supporting plate, and offers no impediment to the progress of the fish through the water." These fishes are also found in a fossil state, and to use the words of Professor Owen, from whose work this description of the *Balistes* is borrowed: "exemplify in a remarkable manner the efficacy, beauty, and variety of the ancient armoury of that order."¶ The stickleback is armed in a similar manner, and is exceedingly pugnacious. The *Cottus diceraus*, Pall., (Fig. 60*b*) has a multi-barbed horn on its back, exactly resembling the spears of the Esquimaux, South American, and Australian savages. The *Naseus fronticornis*, Lac., (Fig. 60*c*) has also a spear-formed weapon. The Yellow-bellied acanthurus is armed with a spine of considerable length upon its tail.

The Australians of King George's Sound use the pointed fin of the roach to arm their spears,** the inhabitants of New Guinea also arm their arrows with the offensive horn of the saw-fish, and with the claw of the cassowary. The sword of the limulus, or king-crab, is an offensive weapon; its habits do not appear to be well understood, but its weapon is used in some of the Malay islands for arrow points (Fig. 61). The natives of San Salvador, when discovered by Columbus, used lances pointed with the teeth of fish.†† The spine of the *Diodon* is also used for arrow points (Fig. 62). Amongst other piercing weapons suggested by the horns of animals, may be noticed, the Indian kandjar composed of one side of the horn of the buffalo, having the natural form and point (Fig. 63). In later times a metal dagger, with ivory handle was constructed in the same country (Fig. 64), after the exact model of the one of horn, the handle having one side flat, in imitation of the half-split horn, though of course that peculiar form was no longer necessitated by the material then used. The same form of weapon was afterwards used with a metal handle (Fig. 65).

* Nineteen Years in Polynesia, Turner, p. 276.

† Beechey's Voyage to the Pacific, vol. i, ch. vi.

‡ Fije and the Fijeans, by T. Williams, Missionary, vol. i, ch. iii.

§ Wilson's Pellew Islands, Keate, pl. v.

|| Klemm Wertzenge und Waffen, p. 48.

¶ Comparative Anatomy and Physiology of Vertebrates, Owen, vol. i, p. 193.

** Klemm, p. 31.

†† Pre-historic Man, vol. i, p. 116.

The sharp horns of the sasin, or common antelope, often steel pointed, are still used as offensive weapons in India (Figs. 66, 67, 68). Several examples of these are in the Museum of the Institution. Three stages of this weapon are exhibited, the first having the natural point, the second a metal point, and the third a weapon of nearly the same form composed entirely of metal. The Fakirs and Dervish's, not being permitted by their profession to carry arms, use the pointed horn of the antelope for this purpose. Fig. 69 is a specimen from my collection; from its resemblance to the Dervish's crutch of Western Asia, I presume it can be none other than the one referred to in the Journal of the Archæological Association, from which I obtained this information respecting the Dervish's weapon.* Mankind would also early derive instruction from the sharp thorns of trees, with which he must come in contact in his rambles through the forests, the African mimosa, the gledischia, the American aloe, and the spines of certain palms, would afford him practical experience of their efficacy as piercing weapons, and accordingly we find them often used by savages in barbing their arrows.†

Striking Weapons.—Many animals defend themselves by blows delivered with their wings or legs; the giraffe kicks like a horse as well as strikes side-ways with its blunt horns; the camel strikes with its fore legs and kicks with its hind legs; the elephant strikes with its proboscis and tramples with its feet; eagles, swans, and other birds strike with their wings; the swan, is said to do so, with sufficient force to break a man's leg; the cassowary strikes forward with its feet; the tiger strikes a fatal blow with its paw; the whale strikes with its tail, and rams with such force that the American whaler "Essex," is said to have been sunk by that animal.‡ There is no known example of mankind in so low a state as to be unacquainted with the use of artificial weapons. The practice of boxing with the fist, however, is by no means confined to the British Isles as some people seem to suppose, for besides the Romans, Lusitanians,§ and others mentioned in classical history, it prevailed certainly in the Polynesian islands|| and in Central Africa.¶

Serrated Weapons.—This class of weapons in animals corresponds to the cutting weapons of men. Amongst the most barbarous races, however, as amongst animals, no example of a cutting weapon is found,**

* Journal of the Archæological Association, vol. iii, p. 26—Cuming on Weapons of Horn.

† The probability of the aboriginal man having derived his first lessons from this source may be judged of by the accounts given by travellers of the effects produced by the large thorns of trees in South Africa, of which there is a good account in Routledge's Natural History of Man, by the Rev. J. G. Wood, chap. xxi. Kaffir. Large animals are said to be frequently destroyed, and even to have impaled themselves upon the large, strong spines of the thorny Acacia. Throughout Central Africa a pair of tweezers for extracting thorns is an indispensable requisite in the equipment of every native.

‡ Beechey's Voyage to the Pacific, vol. i, p. 47.

§ Strabo, b. iii, c. iii.

|| Ellis's Polynesian Researches, chap. viii.

¶ Clapperton's Travels, p. 58.

** I exclude from this category all nippers, cross bills, and prehensile implements.

although the Polynesian islanders make very good knives of the split and sharpened edges of bamboo, and the Esquimaux, also, use the split tusk of the walrus as a knife, they cannot be regarded, nor, indeed, are they used, as edged weapons. These, strictly speaking, are confined to the metal age, and their place, in the earliest stages of civilization, are supplied by weapons with serrated, or saw-like edges.

Perhaps the nearest approach in the animal kingdom to an edged weapon is the fore-arm of the mantis, a kind of cricket, used by the Chinese and others in the East for their amusement. Their combats have been compared to that of two soldiers fighting with sabres. They cut and parry with their fore-arms, and, sometimes, a single stroke with these is sufficient to decapitate or cut in two, the body of an antagonist. But, on closer inspection, these fore-arms are found to be set with a row of strong and sharp spines, similar to those of all other animals that are provided with this class of weapon. The snout of the saw-fish is another example of the serrated weapon. Its mode of attacking the whale is by jumping up high in the air, and falling on the animal, not with the point, but with the sides of its formidable weapon, both edges of which are armed with a row of sharp horns, set like teeth, by means of which it rasps a severe cut in the flesh of the whale. The design in this case is precisely analogous to that of the Australian savage, who throws his similarly constructed spear so as to strike, not with the bone point, but with its more formidable edges, which are thick set with a row of sharp-pointed pieces of obsidian, or rock-crystal. The saw-fish is amongst the most widely distributed of fishes, belonging to the arctic, antarctic, and tropical seas. It may, therefore, very possibly have served as a model in many of the numerous localities in which this character of weapon is found in the hands of savages. The snout itself is used as a weapon by the inhabitants of New Guinea, the base being cut and bound round so as to form a handle. Plate VI, fig. 70, is a specimen from the Museum of the Institution. The weapon of the sting ray, though used by savages for spear-points, more properly belongs to this class, as the mode of its employment by the animal itself consists in twisting its long, slender tail round the object of attack, and cutting the surface with its serrated edge.* The teeth of all animals, including those of man himself, also furnish examples of serrated weapons.

When we find models of this class of weapon so widely distributed in the lower creation, it is not surprising that the first efforts of mankind in the construction of trenchant implements, should so universally consist of teeth or flint flakes, arranged along the edges of staves or clubs, in exact imitation of the examples which he finds ready to his hand, in the mouths of the animals which he captures, and on which he is dependent for his food. Several specimens of implements, edged in this manner with sharks' teeth, from the Museum of the Institution, are now exhibited (Figs. 71, 72, 73, 74). They are found chiefly in the Marquesas, in Tahite, Depeyster's Island, Byron's Isles, the King's Mill group, Radaet Island†, and the Sandwich Islands‡, also in New

* Naturalist's Library, vol. iii, p. 335.

† Voyage Pittoresque Autour du Monde, par M. Louis Choriz, peintre 1822.

‡ Cook's Third Voyage.

Zealand (Fig. 75). They are of various shapes, and used for various cutting purposes, as knives, swords, and glaves. Two distinct methods of fastening the teeth to the wood prevail in the Polynesian Islands; firstly, by inserting them in a groove cut in the sides of the stick or weapon, and, secondly, by arranging the teeth in a row, along the sides of the stick, between two small strips of wood on either side of the teeth, lashed on to the staff, in all cases, with small strings, composed of plant fibre. The points of the teeth are usually arranged in two opposite directions on the same staff, so that a severe cut may be given either in thrusting or withdrawing the weapon.*

A similarly constructed implement, also edged with sharks' teeth, was found by Captain Graah, on the east coast of Greenland, and is mentioned in Dr. King's paper on the industrial arts of the Esquimaux, in the Transactions of the Ethnological Society.† The teeth in this implement were secured by small nails, or pegs of bone; it was also used formerly on the West Coast. A precisely similar implement (Fig. 76), but showing an advance in art by being set with a row of chips of meteoric iron, was found amongst the Esquimaux of Davis Strait, and is now in the department of meteorolites in the British Museum. Others, of the same nature, from Greenland, are in the Christy collection (Fig. 77). The pacho, of the South Sea Islands, appears to have been a sort of club, armed on the inner side with shark's teeth, set in the same manner.‡ The Tapoyers, of Brazil, used a kind of club, which was broad at the end, and set with teeth and bones, sharpened at the point.§

Hernandez gives an account of the construction of the Mexican Maquahuilt or Aztec war club, which was armed on both sides with a row of obsidian flakes, stuck into holes, and fastened with a kind of gum|| (Fig. 78). Herrera, the Spanish historian, also mentions these as swords of wood, having a groove in the fore part, in which the flints were strongly fixed with bitumen and thread.¶ In 1530, according to the Spanish historians, Copan was defended by 30,000 men, armed with these weapons, amongst others; ** and similar weapons have been represented in the sculptures of Yucatan.†† They are also represented in Lord Kingsborough's important work on Mexican Antiquities, from which the accompanying representations are taken (Figs. 78, 79, 80). One of these swords, having six pieces of obsidian on each side of the blade, is to be seen in a Museum in Mexico.

In the burial mounds of Western North America, Mr. Lewis Morgan, the historian of the Iroquois, mentions that rows of flint flakes have been found lying, side by side, in order, and suggesting the idea

* Klemm, *Pre-historic Man*, vol. i, p. 216; Wilkes's United States Exploring Expedition, vol. v, ch. ii.

† Trans. Ethnol. Soc., vols. i-ii, p. 290.

‡ Ellis's Polynesian Researches, chaps. xi, xii.

§ Menhoff—Travels in Brazil; Pinkerton, vol. xiv, p. 874.

|| Tylor—Anahuac, Appendix.

¶ Pre-historic Man, vol. i, p. 216, 217.

** Incidents of Travel in Central America, by J. Lloyd Stephens, p. 51.

†† Pre-historic Man, vol. i, p. 226, 227.

that they must have been fastened into sticks in the same manner as those of Mexico and Yucatan.

Throughout the entire continent of Australia the natives arm their spears with small sharp pieces of obsidian, or crystal, and recently of glass, arranged in rows along the sides near the point, and fastened with a cement of their own preparation, thereby producing a weapon which, though thinner in the shaft, is precisely similar in character to those already described (Figs. 81 and 82). Turning again to the northern hemisphere, we find in the Museum of Professor Nilsson, at Lund, in Sweden, a smooth, sharp-pointed piece of bone, found in that country, about six inches long, grooved on each side to the depth of about a quarter of an inch, into each of which grooves a row of fine, sharp-edged, and slightly-curved flints were inserted, and fixed with cement. The instrument thus armed was fastened to the end of a shaft of wood, and might either have been thrown by the hand or projected from a bow (Fig. 83). Another precisely similar implement (Fig. 84) is represented in the illustrated catalogue of the Museum at Copenhagen, showing that in both these countries this system of constructing trenchant implements was employed. In Ireland, although there is no actual evidence of flints having been set in this manner, yet from the numerous examples of this class of weapon that are found elsewhere, and the frequent occurrence of flint implements of a form that would well adapt them to such a purpose, the author of the Catalogue of the Royal Irish Academy expresses his opinion that the same arrangement may very possibly have existed in that country, and that the wood in which they were inserted may, like that which, as I have already said, is supposed to have held the flints found in the graves of the Iroquois, have perished by decay.

Poisoned Weapons.—It is unnecessary to enter here into a detailed account of the use of poison by man and animals. Its use by man as a weapon of offence is chiefly confined to those tropical regions in which poisonous herbs and reptiles are most abundant. It is used by the Negroes, Bushmen, and Hottentots of Africa; in the Indian Archipelago, New Hebrides, and New Caledonia. It appears formerly to have been used in the South Seas. It is employed in Bootan, Assam, by the Stiens of Cambodia, and formerly by the Moors of Mogadore. The Parthians and Scythians used it in ancient times; and it appears always to have been regarded by ancient writers as the especial attribute of barbarism. The Italian bravoës of modern Europe also used it. In America it is employed by the Darian Indians in Guiana, Brazil, Peru, Paraguay, and on the Orinoco. The composition of the poison varies in the different races, the Bushmen and Hottentots using the venomous secretions of serpents and caterpillars,* whilst most other nations of the world employ the poisonous herbs of the different countries they locate, showing that in all probability this must have been one of those arts which, though of very early origin, arose spontaneously and separately in the various quarters of the globe, after the human family had separated. This subject, however,

* Thunberg's Account of the Cape of Good Hope—Livingstone.

is deserving of a separate treatment, and will be alluded to elsewhere.

In drawing a parallel between the weapons of men and animals used in the application of poison for offensive purposes, two points of similitude deserve attention.

Firstly. The poison gland of many serpents is situated on the upper jaw, behind and below the eyes. A long excretory duct extends from this gland to the outer surface of the upper jaw, and opens above and before the poison teeth, by which means the poison flows along the sheath into the upper opening of the tooth in such a manner as to secure its insertion into the wound. The hollow interior of the bones with which the South American and other Indians arm their poisoned arrows secures the same object (Fig. 85); it contains the poisonous liquid, and provides a channel for its insertion into the wound. In the bravo's daggers of Italy, a specimen of which from my collection is exhibited (Fig. 86), a similar provision for the insertion of the poison is effected by means of a groove on either side of the blade, communicating with two rows of small holes, into which the poison flows, and is retained in that part of the blade which enters the wound. Nearly similar blades, with holes, have been found in Ireland, of which a specimen is in the Academy's Museum, and they have been compared with others of the same kind from India, but I am not aware that there is any evidence to show that they were used for poison. Some of the Indian daggers, however, are constructed in close analogy with the poison apparatus of the serpent's tooth, having an enclosed tube running down the middle of the blade, communicating with a reservoir for poison in the handle, and having lateral openings in the blade for the diffusion of the poison in the wound. Similar holes, but without any enclosed tube, and having only a groove on the surface of the blade to communicate with the holes, are found in some of the Scotch dirks, and in several forms of *couteau de chasse*, in which they appear to have been used merely with a view of letting air into the wound, and accelerating death (Figs. 87 *a* and *b*). The Scotch dirk, here represented, has a groove running from the handle along the back of the blade to within three and-a-half inches of the point. In the bottom of this groove ten holes are pierced, which communicate with other lateral holes at right angles, opening on to the sides of the blade. Daggers are still made at Sheffield for the South American market, with a small hole drilled through the blade, near the point, to contain the poison, and in my collection there is an iron arrow-point (Fig. 88), evidently formed of the point of one of these daggers, having the hole near the point.

It often happens that forms which, in the early history of an art, have served some specific object, are in later times applied to other uses, and are ultimately retained only in the forms of ornamentation. This seems to have been the case with the pierced work upon the blades of weapons which, intended originally for poison, was afterwards used as air-holes, and ultimately for ornament only, as appears by a plug bayonet of the commencement of the eighteenth century in the Tower Armoury, No. 390 of the official Catalogue, for a drawing of which, as

well as that of the Scotch dirk, I am indebted to Captain A. Tupper, a member of the Council of this Institution.

The second point of analogy to which I would draw attention is that of the multi-barbed arrows of most savages to the multi-barbed stings of insects, especially that of the bee (Fig. 89), which is so constructed that it cannot usually be withdrawn, but breaks off with its poisonous appendage into the wound. An exact parallel to this is found in the poisoned arrows of savages of various races, which, as already mentioned, are frequently armed with the point of the sting ray, for the express purpose of breaking into the wound. In the arrows of the Bushmen, the shaft is often partly cut through, so as to break when it comes in contact with a bone, and the barb is constructed to remain in the wound when the arrow is withdrawn (Fig. 90). The same applies to the barbed arrows used with the Malay blowpipe (Fig. 91), and those of the wild tribes of Assam (Fig. 92), which are also poisoned. The arrow points of the Shoshones of North America (Fig. 93), said to be poisoned, are tied on purposely with gut in such a manner as to remain when the arrow is withdrawn. The arrows of the Macoushie tribe of Guiana (Fig. 94) are made with a small barbed and poisoned head, which is inserted in a socket in the shaft, in which it fits loosely, so as to detach in the wound. This weapon appears to form the link between the poisoned arrow and the fishing arrow or harpoon, which is widely distributed, and which I propose to describe on a subsequent occasion. Mr. Latham, of Wilkinson's, Pall Mall, has been kind enough to describe to me a Venetian dagger of glass, formerly in his possession; it had a tube in the centre for the poison, and the blade was constructed with three edges. By a sharp wrench from the assassin, the blade was broken off, and remained in the wound.

It has also been supposed that from their peculiar construction most of the triangular and concave-based arrow heads of flint that are found in this country and in Ireland were constructed for a similar purpose (Fig. 95).

The serrated edges of weapons, like those of the bee, and the sting-ray when used as arrow points, were likewise instrumental in retaining the poison and introducing it into the wound, and this form was copied with a similar object in some of the Florentine daggers above mentioned, a portion of the blade of one of which, taken from Meyrick's ancient arms and armour, is shewn in Fig. 96.*

Although the use of poison would in these days be scouted by all civilised nations as an instrument of war, we find it still applied to useful purposes in the destruction of the larger animals. The operation of whaling, which is attended with so much danger and difficulty, has of late been greatly facilitated by the use of a mixture of strychnine, and woorali the well-known poison of the Indians of South America. An ounce of this mixture, attached to a small explosive shell fired from a carbine, has been found to destroy a whale in less than eighteen minutes, without risk to the whaler.†

* Meyrick—Ancient Arms and Armour, vol. II, Pl. cxiii, figs. 7, 13, 14.

† *Times* newspaper, 24th December, 1866

When we consider how impotent a creature the aboriginal and un-instructed man must have been when contending with the large and powerful animals with which he was surrounded, we cannot too much admire that provision of nature which appears to have directed his attention, during the very earliest stages of his existence, to the acquirement of the subtle art of poisoning. In the forests of Guiana there are tribes, such as the Otomacs, apparently weaponless, but which, by simply poisoning the thumb nail with curare or woorale, at once become formidable antagonists.* Poison is available for hunting as well as for warlike purposes: the South American Indians eat the monkeys killed by this means, merely cutting out the part struck,† and the wild tribes of the Malay peninsula do not even trouble themselves to cut out the part before eating.‡ The Bushmen, and the Stiens of Cambodia use their poisoned weapons chiefly against wild beasts and elephants.

Thus we see that the most noxious of herbs, and the most repulsive of reptiles have been the means ordained to instruct mankind in what, during the first ages of his existence, must have been the most useful of arts. We cannot now determine how far this agent may have been influential in exterminating those huge animals, the elephas primigenius and rhinoceros tichorhinus, with the remains of which the earliest races of man have been so frequently associated, and which, in those primeval days, before he began to turn his hand to the destruction of his own species, must have constituted his most formidable enemies.

Missiles.—Amongst the offensive weapons of animals, the use of missiles cannot be altogether excluded, although the examples of its use by the lower creation are extremely rare. Some species of cuttle-fish have the power of ejecting water with a good aim.§ The toxotes, or archer-fish, obtains its name from its faculty of projecting drops of water at insects some three or four feet from the surface of the water, and which it seldom fails to bring down. The llama has a habit of ejecting its saliva, but I am not aware of the object of this singular practice. I only know from experience that its manners are offensive, and that it has the power of spitting with a good aim and for some distance. The porcupine has the power of throwing its quills, and is said to do so with effect, although it is not now believed to dart them with any hostile intention. The Polar bear is described in Captain Hall's recent publication as an animal capable of capturing the walrus by missile force. It is said that the bear will take advantage of an overhanging cliff, under which its prey is seen asleep upon the ice, to throw down with its paws, large stones, and with such good aim as to hit the walrus on the head, after which, running down to the place where the animal lays stunned, it will take the stone to beat out its brains. That animals are instinctively acquainted with the force of gravitation is evident by their avoiding precipices that would endanger

* Humboldt's Aspects of Nature, vol. i, pp. 25 and 103.

† Klemm.

‡ On the Wild Tribes in the Interior of the Malay Peninsula, by Père Bourien, Trans. Ethno. Soc., vol. iii, p. 78.

§ Darwin's Naturalist's Journey, p. 8.

them, and it certainly requires a slight, but at the same time most important advance upon this knowledge to avail themselves of large stones for such purposes as are here attributed to the bear; but as the story only rests on the authority of the Esquimaux, it must, I think—although they certainly are careful observers of the habits of animals—be rejected, until confirmed by the direct testimony of white men. It has even been doubted whether the alleged habit of monkeys in throwing cocoa-nuts at their pursuers, has not arisen from the mistake of the hunter in supposing that fruit accidentally detached from their stalks by the gambols of these animals in the trees, may have been intended as missiles, but it appears now to be clearly established that monkeys have the intelligence, not only to throw stones, but even to use them in breaking the shells of nuts. Major Denham, in his account of his travels in Central Africa, near Lake Tshad, says:—"The monkeys, or .. as the Arabs say, men enchanted, 'Beny Adam meshood,' were so .. numerous, that I saw upwards of 150 assembled in one place in the .. evening. They did not at all appear inclined to give up their ground, .. but perched on the top of a bank, some 20 feet high, made a terrible .. noise, and rather gently than otherwise, pelted us as we approached .. within a certain distance." This, I think, is clear evidence of a combined pelting on the part of these untutored animals.

The monkey thus furnishes us with the only example of the use of any external substance for offensive purposes, by any member of the animal kingdom. All others, except, perhaps, the missile fishes above described, use, for offence and defence, the weapons with which nature has furnished them, and which are integral parts of their persons. It is this which so essentially distinguishes man from the lower creation. Man is the tool-using animal. We have no knowledge of man, in any state of existence, who is not so; nor have we (with the exception of the ape, the link indirectly connecting him with the lower creation, in the same manner that the savage connects the civilized with the aboriginal man, both being branches from the same stem) any knowledge of animals that employ tools or weapons. Herein lies the point of separation, which, in so far as the material universe is concerned, marks the dawn of a new dispensation. Hitherto Providence operates directly on the work to be performed, by means of the living, animated tool. Henceforth, it operates indirectly on the progress and development of creation, first, through the agency of the instinctively tool-using savage, and by degrees, of the intelligent and reasoning man.

DESCRIPTION OF THE PLATES.

Plate I, fig. 1 (a).—Adze of iron, constructed by Captain Cook's armourer, for the use of the natives of Tahiti, after the model of their own—(b) of stone.

Plate I, fig. 2 (a).—A pipe-handled Tomahawk, of European manufacture, constructed for the North American Indians. Museum of the Royal United Service Institution.—Engraved Illustrations of Ancient Armour. Meyrick, Vol. 2, plate clix.—(b) a Pipe and Tomahawk of pipe stone used by the

Dacotas of North America—Schoolcraft. History of the Condition and Prospects of the Indian Tribes of the United States, Vol. 2, plate lxix.

- Plate I, fig. 3.—A Mæotian, or Scythian Bow, from a fictile vase, represented in Hamilton's Etruscan Antiquities, Vol. 4, plate cxvi.—Critical Enquiry into Ancient Armour. Meyrick, Vol. 1, plate ii.—See also Rawlinson's Herodotus, Vol. 1.
- Plate I, fig. 4.—Bow of the Tartar Tribes on the borders of Persia.—Engraved Illustrations of Ancient Armour. Meyrick, Vol. 2, plate cxliv.—Museum of the Royal United Service Institution.
- Plate I, fig. 5.—Iron Sword of native manufacture, minus the wooden handle, and War Axe, both constructed by the Fans of the Gaboon country, West Africa. From Colonel Lane Fox's Collection. A nearly similar axe is in the Museum of the Royal United Service Institution. The patterns of ornamentation are taken, partly from the Fan War Axe, and partly from some knives of iron brought from Central Africa, by Mr. Petherick, and now in Colonel Fox's Collection.
- Plate I, fig. 6.—Leaf-shaped Bronze Sword, minus the handle, from Ireland. Col. Fox's Collection.—A Bronze Celt, in the Museum at Mainz.—Die Alterthümer unserer heidnischen Vorzeit. L. Lindenschmit. The patterns of ornamentation are taken partly from Lindenschmit, Plate iii, and partly from illustrations of Irish bronze ornamental work in the Illustrated Catalogue of the Royal Irish Academy, by R. W. Wilde, M.D., M.R.I.A. Bronze, pp. 389, 390.
- Plate I, fig. 7.—A Manilla, or specimen of the ring money of copper and iron, used as a medium of exchange in the Eboe country, West Africa. From Colonel Lane Fox's Collection.—In 1836, a ship laden with a quantity of these Manillas, made in Birmingham, after the pattern in use in Africa (the specimen here figured forming part of the cargo), was wrecked on the coast of the county of Cork. By this means their exact resemblance to the gold and bronze Penanular rings found in Ireland (Fig. 8), attracted the notice of Mr. Sainthill, of Cork, by whom the subject was communicated to the *Ulster Journal of Archaeology*, No. 19, July, 1857.
- Plate I, fig. 8.—A Penanular Ring, found in Ireland. Wilde's Catalogue of the Royal Irish Academy. Bronze, p. 570. Gold, p. 53.—Similar forms are found in England, and on the Continent. Linderschmit Tafel iv; Keller, Plate lii a, fig. 9.
- Plate I, fig. 9.—A Caffre Assegai-head of Iron, of native manufacture, with section of blade. Museum of Royal United Service Institution.
- Plate I, fig. 10.—A Saxon Spear-head of Iron, having the same sectional form as Fig. 9. Found in the Saxon graves.—Neville's Saxon Obsequies.—Akerman's Pagan Saxendon.
- Plate II, fig. 11.—War Dress of a Patagonian Chief, composed of seven thicknesses of hide on the body part, and three on the sleeves.—Museum of the Royal United Service Institution.
- Plate II, fig. 12.—Section of the above armour upon the breast, showing the manner in which the seven thicknesses are united at top.
- Plate II, fig. 13.—Kayan Cuirass and Helmet. The helmet of cane wickerwork. The cuirass of untanned hide, having the hair on the outside.—Museum of the Royal United Service Institution, presented by Captain D. Bethune, R.N.
- Plate II, fig. 14.—An Egyptian Breast-plate, made of a crocodile's back.—Engraved Illustrations of Ancient Armour. Meyrick, Skelton, Vol. 2, plate cxlviii.
- Plate III, fig. 15.—A suit of Armour, supposed formerly to have belonged to the Rajah of Guzerat. The four breast and back pieces are of rhinoceros hide, having an inscription upon them, beginning with an invocation to Ali. The remaining portions are of black velvet, ornamented with brass studs, and padded.—Engraved illustrations of Ancient Armour. Meyrick, Skelton. Vol. 2, plate cxli.

- Plate III, fig. 16.—Four plates of steel, of similar form to those of rhinoceros hide in the preceding figure. They are fastened with straps over a coat of chain armour, and are called, in the Persian language, "char aineh," *i. e.* "the four mirrors." They are ornamented with patterns of inlaid gold.—Museum of the Royal United Service Institution.
- Plate III, fig. 17.—A Helmet of Basketwork, from the Sandwich Islands, resembling the Grecian in form.—Museum of the Royal United Service Institution, presented by H. Shelley, Esq.
- Plate II, fig. 18.—A Suit of Armour of cocoa-nut fibre, from Pleasant Island, in the Pacific ocean.—Museum of the Royal United Service Institution, presented by Colonel Sir G. Arthur. It is probable that the under tippet, which is now attached to the back and breast piece at the top, may originally have been intended to be worn round the loins, like a kilt.
- Plate II, fig. 19 (*a*).—Quilted Pectoral of the Egyptians.—Critical Enquiry into Ancient Armour. Meyrick, Vol. I, plate i.—(*b*) shows the manner in which it was worn, and is taken from a figure in Rawlinson's Herodotus.
- Plate III, fig. 20.—Quilted Head-dress of the Egyptian Soldiers.—Critical Enquiry into Ancient Armour. Meyrick, Vol. I, plate i.
- Plate III, fig. 21.—Quilted Helmet of nearly the same form as the above, from India. Colonel Fox's Collection.
- Plate III, fig. 22.—A Head-dress of nearly the same form as figs. 20 and 21, belonging to the Nouer tribe of Negroes, inhabiting both sides of the Nile from 8° to 16° N. latitude, brought to England by Mr. Petherick, and now in Colonel Fox's Collection. It resembles the Egyptian very closely, and is composed of cylindrical white beads, fastened together with a kind of string. The beads are of European manufacture.
- Plate III, fig. 23.—A Helmet of the same form as fig. 21, composed of united mail and plate, formerly belonging to the Body Guard of the Moguls.—Colonel Fox's Collection.
- Plate II, fig. 24.—A Suit of Quilted Armour, taken in action from Keer Singh, the famous Rajpoot Chief, of Jugdespore in Behar, on the 12th of August, 1857, by Major Vincent Eyre, commanding the field force that relieved Arrah.—Museum of the Royal United Service Institution, presented by Major-General Sir Vincent Eyre, K.C.S.I., C.B.
- Plate IV, fig. 25 (*a*).—Suit of Quilted Armour, found upon the body of Tippoo Saib at his death, in the breach of Seringapatam. Upon the breast, this armour consists of two sheets of parchment, and nine thicknesses of quilting, composed of cocoons of the "Saturnia Mylitta," stuffed with the wool of the "Eriodendron Anfractuosum, D.C.," a jungle plant, and neatly sown together, as represented in fig. 25 (*b*).—Museum of the Royal United Service Institution.
- Plate IV, fig. 25 (*b*).—A portion of one of the nine thicknesses of quilting of the above, reduced to $\frac{1}{4}$ th the natural size.
- Plate IV, fig. 25 (*c*).—Tippoo Saib's Helmet; belongs to the above suit.—Museum of the Royal United Service Institution.
- Plate III, fig. 26.—Quilted Armour of the Bornouese Cavalry.—Travels of Denham and Clapperton.
- Plate II, fig. 27.—A Suit of Armour from the Navigator's Islands, composed of cocoa-nut fibre, coarsely netted.—Museum of the Royal United Service Institution; presented by Sir W. Burnett, M.D.—Similar armour is used in the King's Mill Group.
- Plate II, fig. 28.—Part of a Chinese Brigandine Jacket of cotton, quilted with enclosed plates of metal.—Museum of the Royal United Service Institution.
- Plate III, fig. 29.—Head-dress of Hercules wearing the Lion's Skin, from a Bronze in the Blacas Collection, British Museum.
- Plate III, fig. 30.—Head-dress of a North American Indian Chief.—Schoolcraft. History, condition, and prospects of the Indian Tribes, Vol. iii. p. 68, plate x.

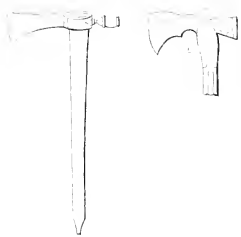
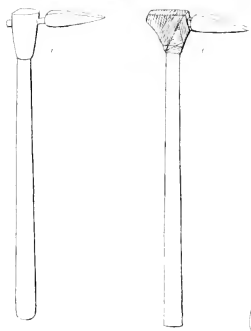
- Plate III, fig. 31.—Thracian Helmet of Brass, with horns of the same.—Critical Enquiry into Ancient Armour. Meyrick, Vol. 1, plate iii.
- Plate III, fig. 32.—Ancient British Helmet of Bronze, with straight horns of the same, found in the Thames.—British Museum.
- Plate III, fig. 33.—Greek Helmet, having horns of brass.—Critical Enquiry into Ancient Armour. Meyrick, Vol. 1, plate iv.
- Plate IV, fig. 34.—Back and Breast-piece of the Bugo Dyaks, armed with the Scales of the Pangolin.—Museum of the Royal United Service Institution.
- Plate III, fig. 35.—A piece of Bark from Talüt, studded with pieces of cocoa-nut shell.—Museum of the Royal United Service Institution.
- Plate III, fig. 36.—Fragment of Scale Armour of Horn, found at Pompeii.—Pictorial Gallery of Arts, Vol. 1, figs. 10, 61.
- Plate III, fig. 37.—A piece of Scale Armour, made of the hoofs of some Animal, from some part of Asia; said to be from Japan.—Critical Enquiry into Ancient Armour.—Meyrick, Vol. 1, plate iii.
- Plate IV, fig. 38.—An ancient Stone Figure in scale armour, having an inscription in a character cognate to the Greek, but in an unknown language.—Cuming on Weapons of Horn, Journal of the Archaeological Association, vol. iii.
- Plate III, fig. 39.—Back and Breast-piece of Armour from the Sandwich Islands, composed of seal's teeth.—Museum Royal United Service Institution; presented by H. Shelley, Esq.
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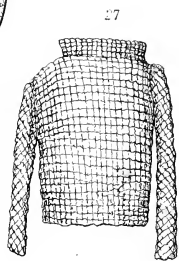
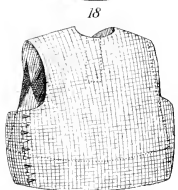
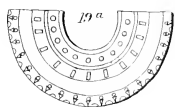
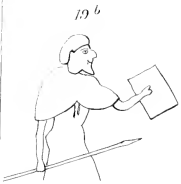
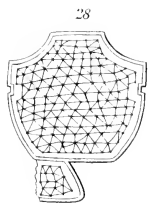
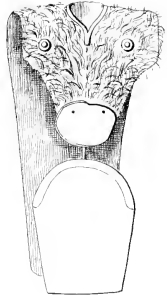
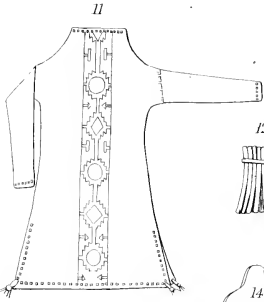
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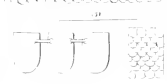
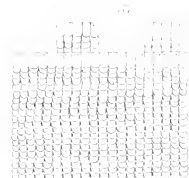
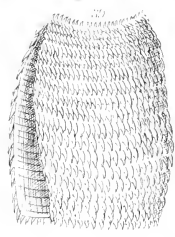
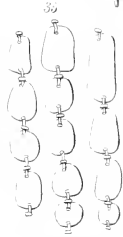
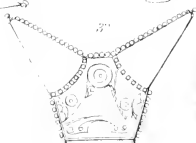
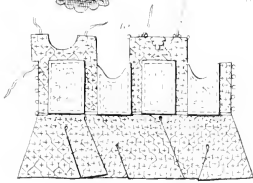
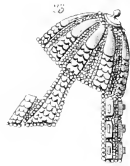


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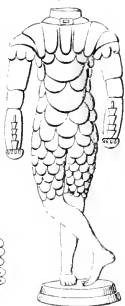
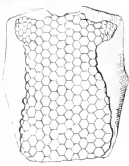
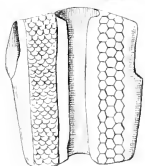




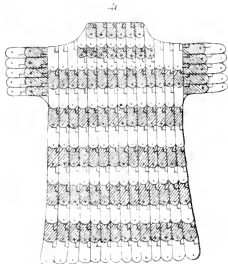
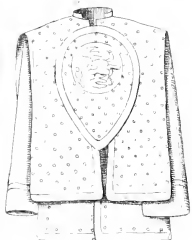


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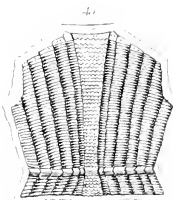
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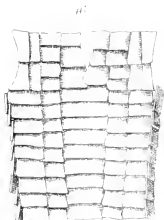
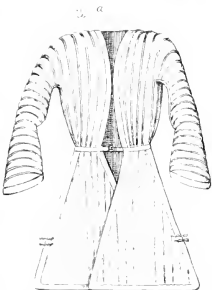
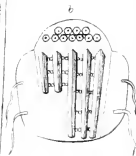
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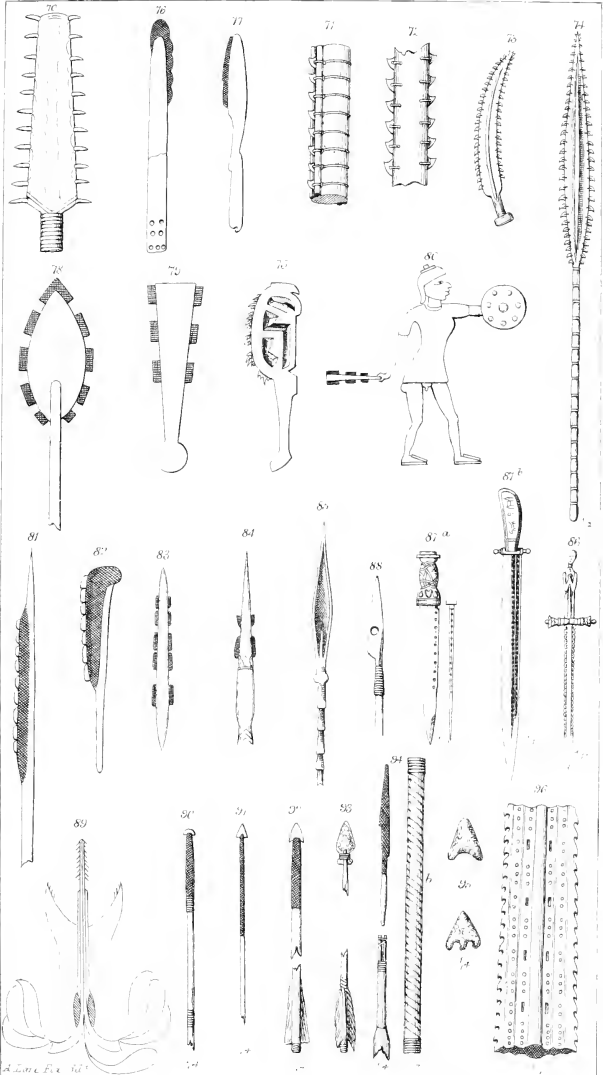
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John Campbell Esq.
from the Author.





