

ON THE
PREHISTORIC REMAINS
OF KENTUCKY

LUCIEN CARR AND N. S. SHALER

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Memoirs of the Geological Survey of Kentucky.

N. S. SHALER, DIRECTOR.

VOL. I. PART IV.

ON THE PREHISTORIC REMAINS
OF KENTUCKY.

BY LUCIEN CARR ¹⁸²⁹⁻ AND N. S. SHALER.

WITH SEVEN PLATES.

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PREHISTORIC REMAINS OF KENTUCKY.

PART I.

ABOUT the middle of the last century, at the time when the first settlers from Virginia and Carolina began to push their way westward into what is now known as the State of Kentucky, they found all that portion of it lying between the Cumberland Mountains and the Ohio River practically uninhabited.* The Shawnee, Chaouanon,† Cats (*Chats*),‡ Satanas,§ or, as the word is said to signify, Southern || Indians, the only nation that within our knowledge has had any settlements in that region,¶ had been conquered and driven out; and the Iroquois, who then claimed the country by right of conquest and did subsequently sell it,** had never occupied it permanently. To this inheritance the white man had succeeded, and though at the time of his arrival the country, as has been said, was destitute of inhabitants, yet he found everywhere traces of the people or peoples who had preceded him. These relics or remains are of many different kinds, and, having for the most part been constructed or fashioned of materials wellnigh imperishable, they still confront us at every turn. Sir John Lubbock †† separates them into “two great divisions: Implements including ornaments, and Earthworks”; and for our present purposes this classification is accepted. Of these two

* Butler's Kentucky, p. 8. Louisville, 1834. President Harrison quoted by Mr. S. F. Haven in the Smithsonian Contributions to Knowledge, Vol. VIII, p. 158. Washington, 1856.

† Narrative of Father Marquette in Discovery and Exploration of the Mississippi, p. 41. Translated by John G. Shea. New York, 1852. Du Pratz, Histoire de la Louisiane. Paris, 1753. Daniel Coxe, Description of the Province of Carolana, with map of Carolana and the River Meschacebe, 1741.

‡ Discovery and Exploration of the Mississippi, by John G. Shea, note to p. 41. New York, 1852. Mémoires Historiques sur la Louisiane, p. 295. Paris, 1753.

§ Colden's History of the Five Nations, p. 23. London, 1747.

|| Indian Tribes of the United States, Schoolcraft, Vol. IV, p. 255. Philadelphia, 1854.

¶ Archæologia Americana, Vol. II, p. 90.

** Treaty of Fort Stanwix in 1768, quoted in Butler's Kentucky, p. 378 *et seq.* Louisville, 1834. Archæologia Americana, Vol. II, p. 59.

†† Prehistoric Times, p. 252. London, 1872.

divisions, the former, consisting almost entirely of implements that have their origin in the wants and necessities of our nature, are such as have been made by barbarous tribes in all times, and are, in great part, similar to the same class of articles known to have been manufactured and used by the modern Indians. The other class, often gigantic in size and as "eternal as the hills," are supposed, from considerations based upon their probable use, etc., to have required for their construction a larger population and a higher degree of civilization than the Indian is known to have possessed; and accordingly they are referred to a mythical people, living at some indefinite period in the dim and shadowy past, whom we have named the Mound-builders. A solution, into which so many unknown factors enter, can hardly be considered satisfactory, but it is accepted for the present, under protest. Later on, when we begin to dig into the mounds, the question of their antiquity will, to some extent, force itself upon our attention. Until then we very willingly leave it, and turn to the other branch of our subject, which promises an equally rich field of study with far more tangible results.

Before beginning our survey of the stone age of Kentucky, it may be well to recall the fact, that American archæologists are not yet prepared to recognize any division in that period as existing within this region; and that hence, in this section of country, stone implements, in themselves, are useless as a measure of time and, except in one direction, unsafe as a test of civilization. In Europe the case is different. There the constant recurrence of a certain type of implement exclusively, in particular geological formations, has afforded archæologists a sufficient ground for insisting upon a separation of the stone period into two divisions; and that distinction is found to be so uniformly maintained, the line of demarcation to be so plainly marked, that the terms "Palæolithic" and "Neolithic,"* or Rude and Polished, when applied to stone implements, have come to signify a relatively definite period in time, not less than certain phases in civilization. Here no such distinction has yet been accepted. Stone implements, perhaps quite as rude as any from the river-drift of France, do exist in great numbers; but the conditions under which they are found, are such as to lead to the conclusion that, so far from being the highest expression of the skill of an extremely rude and primitive people, they are the imperfect or unfinished efforts of the same workmen to whom we are indebted for the most exquisite specimens that have come down to us. There has been no formation

* Prehistoric Times, p. 2. London, 1872.

yet discovered in this country in which we may expect to find stone implements of a certain form and finish exclusively; nor is there any one particular formation, either natural or artificial, to which they are confined. So far from this being the case, the representatives of the two extremes are nearly always found together, lying side by side in the same stratum, apparently undisturbed since they were first deposited; and they also both occur in all of the formations in which either one is known to exist.* Articles found under such conditions must have been co-existent, — there is no escaping the conclusion, — and hence, however much they may differ in workmanship, they cannot be regarded as a trustworthy measure of time.

Nor are they much more satisfactory as a test of civilization, even if it be admitted, that it is possible to infer the general progress of a people in the arts, from skill in any particular branch of handiwork. Of course the best specimens of any given kind of work measure the degree of skill and proficiency of those who executed them, in that particular direction, just as the bone carvings from the caves in France and the sculptured pipes of the Mississippi Valley represent the highest development of those respective peoples in sculpture; but, for the reason given above, the rude or unpolished implements, no matter where found or when made, do not afford a corresponding test. A stone implement from the river-drift of France, the peat-

* Upon this point the conclusions of Dr. C. C. Abbott of Trenton, New Jersey, are of special interest; and as they are based upon a condition of affairs different from any yet discovered in Kentucky, they are given in full.

“Prior to this,” the period of Neolithic Indians, which Dr. Abbott places at some four thousand years ago, “were made and used still ruder implements of stone. Deep in strata of sand and gravel underlying the soil, they are occasionally met with. Throughout this essay I have referred to them incidentally as palæolithic implements. In conclusion, I will briefly state that from the foregoing remarks it will be seen that one of two considerations must be true: either the palæolithic implements belonged to the same people as the neolithic forms, or they are the productions of a distinct people. When it is remembered that the Indians preserve a tradition of being a usurping people, and credence is given to this fact as stated by them according to numerous authors, the relics now found seem corroborative of such a tradition, and these palæolithic implements, so different from the others in many respects, remain as the only trace of that still older people, the autochthonous race of these shores, who were in sole possession when driven away by the incoming Indians, whose own stone implements at the time were but little more elaborate than those of the expelled or subjugated people, but which, as century after century rolled by, became the beautiful specimens of the flint-chipping art which we now find scattered over our hills, along our valleys, and mingled with the pebbles of our forest brooks.” — *Naturalist*, February, 1876.

American archaeologists await with some anxiety the result of further explorations in this field, and if Dr. Abbott succeeds in establishing in this country the existence of a clearly defined line of separation, either in time or civilization, between the makers of the Palæolithic and Neolithic implements, he will have conferred a favor upon the scientific world, which no one can be more ready to acknowledge than the writer.

bogs of Denmark or the lake dwellings of Switzerland tells its simple story of the time when it was manufactured, as compared with articles of a different finish, i. e. whether it was earlier or later, and to a certain extent, gives a tolerably accurate idea of the civilization of the people who made and used it; but a similar implement here, whether dug from the mounds or picked up on the surface, where it was dropped but yesterday by the Indian who fashioned it, of itself, proves absolutely nothing as to its origin; and if of medium or inferior workmanship, only establishes the fact, that the savage who made it was possessed of the skill requisite for this particular job, nothing more.

That this conclusion is frequently accepted with a reservation is well known to the writer. Archæologists, who admit that "the stone axes, hatchets, gouges, arrow-heads, and other implements from the mounds, cannot be distinguished from the same articles that everywhere through the country have proved to be almost identical in kind and form,"* draw the line at the sculptured pipes. Unwilling to accept Mr. Haven's conclusion, "that there is more variety" in these articles, "without much departure from a few established patterns," they maintain with Mr. Squier, that "they exhibit a close observance of nature and a minute attention to details, such as we could only expect to find among a people considerably advanced in the minor arts, and to which the elaborate and laborious, but usually clumsy and ungraceful, not to say unmeaning, productions of the savage can claim but a slight approach";† and that "as works of art, they are immeasurably beyond anything which the North American Indians are known to produce, even at this day, with all the suggestions of European art, and the advantages afforded by steel instruments."‡ Waiving for the present the unlucky reference to "suggestions of European art, and the advantages of steel instruments," the uniform effect of which, observation has shown to be the speedy decay and ruin of the industries belonging to the lower civilization,§ it may be answered: that if the above extracts simply mean that the so-called mound-builder type of pipes, of which Fig. 1, Plate VI, and Fig. 2, Plate

* Mr. S. F. Haven in *Smithsonian Contributions to Knowledge*, Vol. VIII, p. 156. Washington, 1856.

† *Ancient Monuments of the Mississippi Valley*, p. 242. New York, 1848.

‡ *Ibid.*, p. 272. New York, 1848.

§ *Antiquities of the Southern Indians*, p. 399. New York, 1873. Mr. E. T. Stevens, in a paper read at the Southampton meeting of the Royal Archaeological Institute of Great Britain and Ireland, entitled the Stone Period, p. 17, holds the following language: "Savagery loses confidence in itself when in the presence of a higher civilization, and the savage becomes more or less dependent upon the arts of the higher and more favored race."

VII, are believed to be fair samples of their kind, shows a higher degree of artistic taste and skill in their conception and execution than any similar article now manufactured by the North American Indians, it is granted. Being a matter of taste, there is no room for discussion; and although after making allowance for difference of material, we have been unable, on a somewhat careful comparison of specimens from the mounds with the product of the modern Indians, and of those figured by Mr. Squier,* especially those in the likeness of the human face, with similar representation in Catlin† and Schoolcraft,‡ to discover grounds of difference sufficiently broad to justify the claim for superiority, yet it is very possible that any one, with a trained eye and a keener sense of beauty, might well arrive at a different conclusion. But if, as was probably the case, the idea intended to be conveyed is, that the presence in the mounds of carved pipes of a certain order of workmanship is a proof of the existence here, at some former time, of two nations possessed of different civilizations, or of the same people in different stages of progress, the answer is most decidedly, Not so! and for the very sufficient reason, that it is by no means certain that many of the pipes we now have, belonging unmistakably to the Mound-builder class, were not manufactured by these very self-same Indians. Of course it is well known that the pattern of pipe now under consideration—i. e. that in which the figure of the animal is not carved *on* the pipe, but is itself the pipe—has been often met with in the mounds, and that it is owing to this fact, that sculptures of this class are usually ascribed to the people who built these mounds. But this is not sufficient to establish the claim of these people to the superior artistic development as indicated by this style of workmanship, unless it can be shown, that they were the only people that ever lived here, who carved pipes in this fashion; and this can scarcely be done. Indeed, it is believed that the very reverse is true; and in proof of it, reference is made to any collection of Indian antiquities, especially those from the Northwest coast,§ or to the plates given in Schoolcraft|| and Catlin,¶ in which the idea of utilizing the figure of

* Ancient Monuments of the Mississippi Valley, p. 244 *et seq.* New York, 1848.

† North American Indians, p. 234, Pl. LXIV. London, 1848.

‡ Condition and Prospects of the Indian Tribes of the United States, Vol. II, p. 512, Pl. LXIX and LXX, and Vol. I, Pl. IX and XIII. Philadelphia, 1848.

§ The Peabody Museum of American Archaeology and Ethnology, at Cambridge, Mass., has a very fine collection of these antiquities.

|| Indian Tribes of the United States.

¶ North American Indians, p. 234, Pl. LXIV. London, 1848.

the animal as a pipe—one of the principal features by which the Mound-builders' work is distinguished from that of the modern Indians—is repeated in a hundred different shapes, in different materials, and with varied success. But even if the Indian had lost the taste and skill necessary to the sculpture of these articles, as might have been expected when at a later period he was brought into contact with a higher civilization, the argument would still be defective, for the reason that these pipes are not confined to the mounds alone, but are found elsewhere. Within the last ten or twenty years perhaps a majority of those recovered have been found on the surface, in the very latest formations that it is possible for science to recognize. According to Colonel C. C. Jones,* Professor E. T. Cox,† and Mr. Squier,‡ they are not unfrequently dug from refuse piles, turned up by the plough or picked up on the surface; but wherever found, it is worthy of note that it is always in some locality which is known to have been a resort of the Indians for a century or more, and in immediate juxtaposition with axes, arrow-heads, and other stone implements which it is admitted the savage could and did make. If any conclusion at all can be drawn from these facts, it is certainly not favorable to the existence here of two civilizations, but rather of one, and that one the Indian's. Admitting that he chipped the arrow-heads and polished the axes, and it is hardly possible to escape the conclusion that he also carved the pipes which are found with them, and as a consequence, might have built the mounds, in which they were often buried. But if, descending to particular instances, it should be urged that the Catlinite and Steatite, of which Figs. 1 and 2, Plate VII, are respectively made, cannot be found within the limits of Kentucky, and that the workmanship shows a higher degree of skill than the Shawnee Indians—the particular tribe which lived within those limits—are known to have possessed, it will be a sufficient answer to point to the compulsory pilgrimage of that nation, extending from the waters of the Savannah River§ in the south to the shores of Lake Erie|| in the north, and from the

* *Antiquities of the Southern Indians*, p. 401. New York, 1873.

† *Geological Survey of Indiana for 1874*, p. 36. Indianapolis, 1875.

‡ *Ancient Monuments of the Mississippi Valley*, p. 428. New York, 1848.

§ *Adair, History of the American Indians*, pp. 340, 392. London, 1775. *Indian Tribes of the United States*, Vol. IV, p. 202.

|| *Carte de la Louisiane et du cours du Mississippi dressée sur un grand nombre de Mémoires entr'autres sur ceux de M^e le Maire par Guillaume de L'Isle de l'Académie Royale des Sciences*. Amsterdam, 1720. Note to *Narrative of Father Marquette in Discovery and Exploration of the Mississippi Valley*, by John G. Shea, pp. 41, 42. New York, 1852. *History of the Five Nations*, by C. Colden, p. 23. London, 1747.

Susquehanna River* of Pennsylvania, to the lower Illinois,† during which they must have been brought into contact with people to whom these minerals were familiar; and to suggest that, after the custom of Indians in general, they either begged or bought, or, which is far more probable, stole the coveted article from its more fortunate possessor, who perhaps, like their neighbors the Cherokees, lived in a country that “contained many different sorts and colors of soils proper for such uses,” and who were known to have excelled in such work.‡

For these reasons we shall make no attempt to assign any of the specimens that have come within our observation to any particular period of time or phase of civilization. They are all what are technically known as “surface finds,” though probably manufactured at intervals of greater or less duration, and may have belonged to any time covered by that very comprehensive but altogether indefinite phrase. Returning from this digression, the importance of which will be seen hereafter, we can now begin our survey of the Stone Implements of Kentucky without any of the glamour that attaches to the memorials of an extinct civilization. By reference to our Plates it will be seen that Nos. I, II, and III are composed almost entirely of spear and arrow heads, and consequently they may be considered *en masse* without reference to their numerical order, except in those instances in which an especial notice is deemed necessary. The specimens are given full size, as are all our figures, with the exception of Fig. 1, Plate VI, which is on a scale of one half. They were picked up in the valley of the Ohio, near Louisville, and in Edmonson, and adjoining counties on Green River. These streams, abounding in fishes, were favorite resorts with the prehistoric people as well as with the modern Indians, as is shown by the number and character of the remains along their shores. The specimens selected are believed to represent very fairly the workmanship of the region in which they were found, and do not differ greatly, except in material, from those found elsewhere in the State and the United States. Indeed, it is probable that the field of comparison might be extended so as to include Europe and South America without affecting, materially, the truth of the statement. Forms, indeed, do

* Indian Tribes of the United States, Vol. IV, pp. 256–334. Schoolcraft's Notes on the Iroquois, p. 154.

† Narrative of Father Membré in Discovery and Exploration of the Mississippi, by John G. Shea, p. 163. New York, 1852. Narrative of Father Douay in Discovery and Exploration of the Mississippi, by John G. Shea, p. 224. New York, 1852.

‡ Adair, History of the American Indians, p. 423. London, 1775.

differ, and certain styles seem to have been popular in certain sections of country, but they all grade into each other so insensibly that it is often difficult to know exactly how to classify them. Of the four divisions into which Mr. John Evans* separates the javelin and arrow heads of Great Britain, two are certainly found in Kentucky, viz. the "stemmed" or "tanged" (Figs. 14, 15, 17, Plate II) and the triangular (Figs. 1, 3, 7, Plate I), whilst the distinctly "leaf-shaped" and "lozenge-shaped" are seldom seen, but appear to have been merged into the "oval" (Figs. 2, 6, 15, Plate III), which exists in great numbers. The classification into spear-points and arrow-heads is based altogether upon size, and the line of separation varies with the fancy of the collector. Figs. 3, 6, 7, of Plate I, we should say, are spear-points just as surely as 1 and 2, Plate I, and Nos. 7 and 10 of Plate II, are arrow-heads. All between these two sizes may be classed either way. The limits, within which this class of weapons varies, are very great. There are arrow-heads in the collection of the Kentucky State Geological Survey smaller and more delicate even than those represented in Plate I, and Colonel C. C. Jones† figures a spear-head obtained from Georgia that is about twice the size of the large one we have given in Plate I, measuring nearly fourteen inches in length and weighing two pounds and two ounces, avoirdupois. Attention is directed to the fact that these weapons were all made by chipping alone. Grinding and polishing could add nothing to their efficiency, and hence they were left as we now find them. They are usually made of the chert that is common in the limestone districts of Kentucky, though in other portions of the State, as in the neighborhood of the Cumberland Mountains, other material was not unfrequently used. In making implements of this kind two methods seem to have been employed, viz. pressure and percussion, depending perhaps somewhat upon the nature of the material; though it is not at all improbable that both methods were used in manufacturing the same implement, the one supplementing the other at different stages of the work. Indeed, Mr. T. R. Peale,‡ of the Scientific Corps, United States Exploring Expedition, who saw the Shasta Indians of California at work making arrow-heads, thus describes the process: "The flakes were struck off from the mass of jasper, agate, or chalcedony, by a blow with a round-faced stone, and the edges were chipped by the application of a notch in a piece of horn, as a

* Ancient Stone Implements of Great Britain, p. 329. London, 1872.

† Antiquities of the Southern Indians, p. 252, Pl. VII. New York, 1873.

‡ Flint Chips, p. 79. London, 1870.

glazier chips glass. The notches in the horn tool were of different sizes and depths, in order to suit the work to be done." This notched horn is probably the same tool described by Captain John Smith,* in the sixth voyage to Virginia, when, speaking of the Indians, he says: "His arrow-head he quickly maketh with a little bone, which he ever weareth at his bracert, of a splint of stone or glasse in the form of a heart, and these they glew to the end of their arrowes. With the sinewes of Deere and the tops of Deeres hornes boyled to a jelly, they make a glew that will not dissolve in cold water." Full accounts are given of the two processes by early writers and recent travellers, so that there is no lack of knowledge on the subject. From the mass of testimony, enough is selected to give an idea of the mode of work in this seemingly refractory material. The method by "percussion," as practised among the Shasta Indians of California, is thus described by the Hon. Caleb Lyon in a communication to the American Ethnological Society,† for December, 1860:—

"The Indian seated himself on the floor, and, laying the stone anvil upon his knee, with one blow of his agate chisel he separated the obsidian pebble into two parts; then, giving a blow to the fractured side, he split off a slab a quarter of an inch in thickness. Holding the piece against his anvil with the thumb and finger of his left hand, he commenced a series of continuous blows, every one of which chopped off fragments of the brittle substance. It gradually seemed to acquire shape. After finishing the base of the arrow-head (the whole being little over an inch in length), he began striking gentle blows, every one of which I expected would break it in pieces. Yet such was his adroit application, his skill and dexterity, that in little over an hour he produced a perfect obsidian arrow-head."

The same Indian, after two failures, which he accounted for by saying that he did not understand the grain of the glass, made an arrow-head from the remains of a broken bottle.

Schoolcraft‡ thus describes the mode of manufacturing similar implements: "This horn-stone is less hard than common quartz, and can readily be broken by contact with the latter. Experience has taught the Indian that some varieties of horn-stone are less easily and regularly fractured than others, and that the tendency to a conchoidal fracture is to be relied on in

* History of Virginia, p. 31. London, 1632.

† Quoted in Flint Chips, pp. 77, 78. London, 1870.

‡ Indian Tribes of the United States, Vol. III, p. 467. Philadelphia, 1853.

the softer varieties. It has also shown him that the weathered or surface fragments are harder and less manageable than those quarried from the rocks or mountains.

“To break them, he seats himself on the ground, and holds the lump on one of his thighs, interposing some hard substance below it. When the blow is given, there is a sufficient yielding on the piece to be fractured, not to endanger its being shivered into fragments. Many are, however, lost. After the lump has been broken transversely, it requires great skill and patience to chip the edges. Such is the art required in this business, both in selecting and fracturing the stones, that it is found to be the employment of particular men, generally old men, who are laid aside from hunting to make arrow and spear heads.”

Of the method of making flakes by “pressure,” to be afterwards worked up into arrow-heads or used as rude knives, as practised among the Mexicans, the following account is given by Torquemada:.*—

“One of these Indian workmen sits down upon the ground, and takes a piece of this black stone” (obsidian) “about eight inches long or rather more, and as thick as one’s leg or rather less, and cylindrical; they have a stick as large as the shaft of a lance, and three cubits or rather more in length; and at the end of it they fasten firmly another piece of wood, eight inches long, to give more weight to this part; then pressing their naked feet together, they hold the stone as with a pair of pincers, or the vice of a carpenter’s bench. They take the stick (which is cut off smooth at the end) with both hands, and set it well home against the edge of the front of the stone, which is also cut smooth in that part; and then they press it against their breast, and with the force of the pressure there flies off a knife with its point and edge on each side, as neatly as if one were to make them of a turnip with a sharp knife, or of iron in the fire, . . . in a very short time these workmen will make more than twenty knives in the aforesaid manner. They come out in the same shape as our barber’s lancets, except that they have a rib up the middle, and have a slight graceful curve towards the point.” These flakes were so sharp that the Spaniards sometimes used them as razors, and according to Clavigero a single workman could produce one hundred per hour.† The Esquimaux, having produced the flakes from chert by a slight tap with a hammer formed of a very stubborn kind of

* Quoted in *Flint Chips*, p. 79, 80.

† Quoted in *Ancient Stone Implements of Great Britain*, p. 22. London, 1872.

jade or nephrite,* according to Sir John Lubbock† “make their arrow-heads of stone, not by blows, but by pressure, for which purpose they use the point of reindeer’s horn, set in bone; bone itself would not be tough enough.” From all these extracts it will be observed that in both processes the order of procedure is the same, though the methods differ. The first step is to strike off the flake or slab “shaped like a lancet,” and this is afterwards worked up into a spear or arrow head, “percussion” or “pressure” being alike used at either stage of the work. If additional light be needed, it may be found in the experience of the gun-flint makers of England,‡ who still practise the art of working in flint, and in the experiments of Mr. John Evans,§ who in a true spirit of scientific inquiry has manufactured arrow-heads both by “pressure” and by “blows” or “percussion,” and showed what an exceedingly effective tool can be made of a common pebble or a piece of stag’s horn, in the hands of a skilful workman.

In confirmation of what is said about its being the work of particular men set aside for the purpose, Mr. Catlin,|| in his account of arrow-making among the Apache Indians, says that each tribe has its “factory,” and that “only certain adepts are able or allowed to make them for the use of the tribe. Erratic boulders of flint are collected (and sometimes brought an immense distance), and broken with a sort of sledge-hammer made of a rounded pebble of horn-stone, set in a twisted withe, holding the stone, and forming a handle. The flint, at the indiscriminate blows of the sledge, is broken into a hundred pieces, and such flakes selected as, from the angles of their fracture and thickness, will answer as the basis of an arrow-head.” Colonel C. C. Jones¶ upon the same point holds the following language, “it is said that among the Indians of Cherokee, Georgia, in ancient times, were men who devoted their attention to the manufacture of spear and arrow heads, and other stone implements. As from time to time they accumulated a supply, they would leave their mountain homes and visit the sea-board and intermediate regions for the purpose of exchanging these implements for shells and various articles not readily obtainable in the localities where they re-

* Ancient Stone Implements of Great Britain, p. 23.

† Prehistoric Times, p. 502. London, 1872.

‡ Flint Chips, p. 578. London, 1870.

§ Ibid., pp. 84, 85.

|| Last Rambles among the Indians, quoted in Flint Chips, p. 82. London, 1870.

¶ Antiquities of the Southern Indians, p. 243. New York, 1873.

sided. These were usually old men, or persons who mingled not in the excitements of war and the chase." Elsewhere he* speaks of an open-air "work-shop which was littered with flakes, chips, and arrow and spear points in various stages of completion. Some had evidently been discarded during the process of manufacture, upon the discovery of an unexpected defect in the material; while others, failing to yield the desired fracture, had been thrown aside as involving too great an expenditure of labor. Fine nuclei of flint and quartz lay half embedded in the soil." Similar workshops are not uncommon in Kentucky, and serve to indicate centres of activity, as do also the Potteries and those peculiar stationary mortars, worn in the sandstone, which were used by the Indians for pounding corn; but, taken alone, they do not establish the fact of the division of labor among the aborigines, though their weight as confirmatory evidence is apparent.

Of the skill attained in this branch of workmanship the figures furnish abundant evidence. It is perhaps hardly equal to the Danish flint work, but any disparity is accounted for by the inferior character of the chert, as compared with the flint of Northern Europe. The ripple-marking in Fig. 10, Plate II, is especially worthy of note, as are the delicate workmanship and regular graceful outlines of other specimens.

Figs. 8, 9, Plate III, belong to the class known as Rotary arrow-heads, and are believed to be peculiar to this country. They are described as having "their edges bevelled in opposite directions," causing "the arrow in its flight to take a rotary motion, thereby increasing the violence of the wound when the barb had entered the flesh."† Figure 10, Plate III, belongs to the same class, but differs in this, that the twist seems to have been in the flint flake itself,—a result most probably of the original fracture,—and of this, the primitive workman merely took advantage. As to the fact that these arrow-heads do give this peculiar revolving motion to the arrow, there can be no doubt, our own experiments amply confirming all that has been said on this point. Even when the shafts were feathered in the usual manner, with three strips of feathers arranged in straight lines, it was found that the arrow, if shot with any degree of force, assumed at once a revolving motion similar to that of the rifle-ball. Of course, if the shaft had been grooved and the half-twist had been used in feathering it, this effect would have been enhanced. As it was, however, the result was so entirely

* *Antiquities of the Southern Indians*, p. 242. New York, 1873.

† *Ibid.*, p. 255.

satisfactory that it was not thought necessary to pursue the investigation any further. But whilst admitting the fact of this motion, it may be doubted whether the primary object of the workman was to produce it. The size and character of the wound inflicted by a weapon of this peculiar shape moving in one direction, might well have commended its use upon certain occasions, without attributing to the artisan who made it the desire to produce an effect, that is highly problematical, by giving his arrow a double motion; even if his own vagrant fancy, to say nothing of the unwillingness to lose an otherwise valuable "flake," had not been sufficient to account for the adoption of a pattern, which is entirely too rare to have been of any exceptional value.

Figs. 14 and 16, Plate III, may be either of several things. Mr. John Evans* calls similarly shaped implements arrow-heads of the chisel-ended type. Elsewhere, he suggests that they may have been boring tools.† Mr. Squier‡ thinks they were used in constructing swords of the shark's-tooth pattern, like those made by the ancient Mexicans and recently in use by the Pacific-Islanders. Colonel Jones§ classes them as knives for the satisfactory reason that "they are brought all around to a cutting edge." Fitted into a suitable handle they would be far superior to many similarly shaped implements that are so used by the modern Indians.

Figs. 7 and 12 are "fleshers," or "skin-scrapers." At all events, they resemble implements, used for that purpose among the Esquimaux of to-day, which are described by Sir John Lubbock|| as "oblong stones, rounded at one end, which is brought to a bevelled edge by a series of small blows." They were probably intended to be fitted into a handle, and when fitted with a handle suitable for pushing, they may also have been used as planes. Sir Edward Belcher¶ describes a similar implement, somewhat larger and with the same bevelled edge, as being used in this way among the Esquimaux, in the manufacture of bows and other articles of wood.

Figs. 11 and 13, Plate III, are probably similar implements, and were used for the same purpose. Some of them were no doubt designed as arrow-heads, but, having been broken, were afterwards utilized in this manner. This is

* Ancient Stone Implements of Great Britain, p. 352. London, 1872.

† Ibid., p. 291. London, 1872.

‡ Ancient Monuments Mississippi Valley, p. 211. New York, 1848.

§ Antiquities Southern Indians, p. 291. New York, 1873.

|| Prehistoric Times, p. 95. London, 1872.

¶ Quoted in Ancient Stone Implements of Great Britain, p. 269. London, 1872.

not always the case, however, as specimens are found which are broader at the bevelled edge than elsewhere, showing that this form was deliberately chosen. The stem or tang was probably of use in fastening the tool in the handle. The Egyptians used an arrow-head of somewhat similar shape, but the edge differed, being chisel-shaped like a small gun-flint,* instead of rounded and bevelled. The common name of skin-scrapers probably describes them with sufficient accuracy.

Figs. 3, 16, 5, Plate II, the latter broken, are good specimens of a form of arrow-head that is somewhat rare. Possibly the ease with which it may be broken will account, in part, for its scarcity. The body of the arrow is long and thin or flat, which makes it very brittle. Neither Professor Nilsson† nor Mr. John Evans figures anything like these. They were probably intended for shooting fish, as they are entirely too delicate and fragile to withstand the rough usage incidental to the chase; and the very small amount of surface exposed to the resisting medium of the water is well adapted to this purpose.

Figs. 2, 6, 15, of Plate III, may have been used as javelin and arrow heads or as knives. Figs. 2 and 6 were found on the farm of Mr. H. J. Craycraft, sixteen miles below Louisville on the river, beneath the stump of a beech-tree two and one half feet in diameter, that had been burned down. There were forty-seven of them together, all piled up regularly.

Fig. 3, Plate IV, is a knife, and, being of chipped flint, it may properly come under this head. In form it is strikingly like the modern bowie-knife. This beautiful specimen is from the collection of Dr. James Knapp of Louisville, Kentucky, to whom we are under obligations for the privilege of figuring some of the most beautiful articles we have given.

Fig. 1, Plate IV, is a bone awl made from the tibia of a bird. It was found on the banks of the Ohio, at the mouth of Twelve Mile Creek, above Cincinnati, having been washed out by a rise in the river. The stratum in which it had been embedded was about two feet from the surface of the ground, and contained the usual articles found in and about an Indian encampment. Quantities of potsherds were lying around in the ploughed field, as were arrow-heads and a broken stone axe; and it is probable that this place was once used as a pottery, though the clay was not found *in situ*. Of course the river would furnish all the shells necessary for kneading with

* Ancient Stone Implements of Great Britain, p. 329. London, 1872.

† Primitive Inhabitants of Scandinavia. London, 1868.

the clay. It is proper to say that the depth of the deposit is not a safe measure of antiquity, especially when the field of observation was limited, as it was in the present instance. A hollow on the original surface of the ground, or a temporary check to the current of the river, such as is often produced by fallen timber, will frequently cause a deposit entirely disproportionate to the length of time it has been accumulating.

Fig. 2, Plate IV, belongs to a class of implements or ornaments sometimes called tablets or gorgets, and is supposed to have been worn as an ornament; or it may have been used in equalizing the size of the bow-strings made from sinew, just as twine is now made uniform by being drawn through a circular hole.* Similar implements slightly rounded in form are found in England, and it has been suggested that they were made so, in order to fit on the arm and guard it against the blow of the string in shooting, like those used by archers in modern days.† In this country they are usually made of a ribboned slate or of some variety of stone that will take on a high polish. The number of holes varies, but is generally two, and they are placed near the middle about an inch apart, as in the specimen figured. Many of these articles are very thin and fragile, too much so to be put to any practical use whatever, and these were doubtless worn suspended around the neck. There are others, made of coarser material and unpolished, and much thicker and stronger every way, which may have been used in preparing bow-strings. This specimen belongs to Dr. Knapp of Louisville, by whom it was kindly loaned.

Fig. 4, Plate IV, is a plummet-shaped implement, of "hematite," very highly polished and of graceful outline. It was found on Green River, and was given to Mr. Putnam of the Peabody Museum of Archaeology, Cambridge, Massachusetts, by Mr. Charles J. Adams of Bowling Green, Kentucky. Its weight is three and one half ounces, rather too heavy for an ear-bob, though it has been suggested that similar articles were so worn. Colonel Jones‡ with more reason thinks it may have been used, "after the fashion of the modern bobbin, in twisting bow-strings, plaiting belts, and weaving various articles for personal decoration." The two rings cut around the top would have been equally serviceable in the event of its being used

* Ancient Stone Implements of Great Britain. London, 1872.

† Ibid.

‡ Antiquities of the Southern Indians, p. 371. See also Dr. J. G. Henderson's article on "Plummetts" with note by F. W. Putnam in *American Naturalist*, Vol. VI. p. 241, *et seq.*

either as an ornament, or in weaving or preparing the thread for the loom.

Fig. 5 of the same plate is a turtle-shaped implement, of the size here given and an inch and three tenths in thickness. The faint groove that is seen across the back and sides does not extend any farther, — the lower or belly side of the animal being flat. This implement is of quartz, and it may have been used in weaving or in making thread for nets or bags. Both Adair* and Du Pratz† speak of the art of weaving as being practised among the Indians, and specimens of their cloth and work-bags, obtained from the caves of Kentucky by Mr. Putnam,‡ are now preserved in the Peabody Museum at Cambridge.

Fig. 7, Plate IV, is a perforated implement of diorite, belonging to the collection of Dr. James Knapp of Louisville. A side view shows it to be almost lozenge-shaped, or rather triangular; the base being a single line, slightly curved. The perforation extends lengthwise through the implement, and the bore is larger at one end than the other.§ Mr. Squier and Colonel Jones figure implements similar in shape, and suggest that they were worn as ornaments, assigning them to the class called gorgets.

Fig. 6, Plate IV, is a polished chisel of greenstone, called from its use a “flesher” or “scraper.” Schoolcraft|| speaks of it as a “species of hand chisel, blunt, that it may not cut the skin, and yet of sufficient edge and hardness to permit a stout jerking blow. It was grasped firmly by the top, . . . used for removing the flesh and integuments from the skin. It was often very rude, and presented nothing but an elongated stone, small and brought to a blunt edge. By this means the skin of the deer and other animals was completely rid of its adhering flesh, prior to the process of currying, braining, smoking, or such other processes as it required to fit it for the various

* History of the American Indians, p. 422. “I am assured that the Muskohge” or Creeks “passed the woof with a shuttle; and they have a couple of threddles, which they move with the hand so as to enable them to make good despatch, something after our manner of weaving.”

† History of Louisiana, Vol. II, p. 231. London, 1763. “They” (the Natchez Indians) “plant two stakes in the ground, about a yard and a half asunder, and having stretched a cord from the one to the other, they fasten their threads of bark double to this cord, and then interweave them in a curious manner into a cloak of about a yard square, with a wrought border round the edges.” Captain John Smith in the History of Virginia, says the Indians “make nets for fishing, for the quantitie as formally braded as ours.”

‡ Archaeological Researches in Kentucky and Indiana. 1874.

§ For the description of this implement I am indebted to Dr. Knapp, my own memorandum having been mislaid.

|| Indian Tribes of the United States, Vol. I, p. 91. Philadelphia, 1791.

uses to which it might be devoted." These implements vary in size and in the material of which they are made. Some are of chipped flint, as Figs. 7, 11, 12, 13, of Plate III; others are of greenstone, polished to the very highest degree, and one belonging to the Kentucky Survey measures $7\frac{2}{16}$ inches in length, and weighs 1 lb. $13\frac{1}{2}$ oz. There can be no doubt that the name "flesher" correctly describes the use to which many of these implements were put, but it is also evident, from the sharpened edge, the broken blade, and battered head, that not a few of them were used as axes and wedges. To this class may have belonged all of that very common form, in which the head or butt of the tool is drawn out to a point more or less obtuse, as if for the purpose of being fitted *into* a handle and so made available. Of the method by which this was sometimes done, Captain Bossu* gives the following account, which is confirmed by Lafitau.† "They choose a young tree for that purpose, in which they make an incision with a flint or pebble as sharp as a razor, and they put a stone cut in form of a hatchet, into the incision; therefore as the tree grew up, it enchased the stone, which by that means became inseparable from it, and they afterwards cut it off in order to make use of it; their lances and darts were made in the same manner."

Plate V represents a very handsome grooved axe of greenstone belonging to Dr. James Knapp of Louisville. It was found in making excavations within the limits of that city, and doubtless belongs to the class of tools thus described by Lafitau:‡ "They are made of a kind of very hard tough stone . . . by rubbing them on a sandstone and giving them, at the sacrifice of much time and labor, almost the shape of our axes, or of a wedge for splitting wood. The life of a savage is often insufficient for accomplishing the work, and hence such an implement, however rude and imperfect it may be, is considered a precious heirloom for the children." Many, perhaps a majority, of these axes have but a single groove,—the one around the head,—in which the withe or withes that form the handle are wound; those having two, as in the figure given, are not uncommon, and in the Peabody Museum there is a specimen with three,—one around the head, and one on each side lengthwise,—the two latter being used for wedging and tightening the axe in its handle. This form of tool, though common in this country, is rare in Europe, a few only having been found in Scandinavia;§ but hammer

* Travels through that part of North America formerly called Louisiana, Vol. II, p. 223. London, 1771.

† Mœurs des Sauvages Américains, Vol. III, p. 100. Paris, 1724.

‡ Ibid.

§ Ancient Stone Implements of Great Britain, p. 210.

stones, grooved in precisely the same way, and similar in every respect to those found in the copper-mines of Lake Superior, are not uncommon in the mining districts of Great Britain* and of other countries that are known to have passed through a stone age. Another point of dissimilarity not less marked is to be found in the material used in the manufacture of these implements. Here axes—and under this head are included scrapers of the chisel shape—are almost universally made of some variety of greenstone, scarcely ever of flint; whilst in Europe this latter material seems to have been a favorite for all forms that did not require perforation.† Out of quite a large collection of these tools belonging to the Kentucky Geological Survey, there is but one single specimen of flint, and that is so exceedingly rude that but for the notch on each side near the head, to hold the handle, instead of the usual groove around the head, it would pass very well for a representative of the palæolithic age. As might have been expected, these tools vary greatly in size. Of the method of hafting and using them, Adair‡ thus speaks: “The Indians formerly had stone axes, which in form commonly resembled a smith’s chisel. Each weighed from one to two or three pounds’ weight. They were made of a flinty kind of stone: I have seen several, which chanced to escape being buried with their owners, and were carefully preserved by the old people, as respectable remains of antiquity. They twisted two or three tough hiccory slips of about two feet long, round the notched head of the axe; and by means of this simple and obvious invention, they deadened the trees by cutting through the bark, and buried them, when they either fell by decay or became thoroughly dry. . . . By the aforesaid difficult method of deadening trees, and clearing the woods, the contented natives got convenient fields in process of time.” Du Pratz§ admits that it would have been an impracticable task to cut down trees with this kind of an axe, and says, “they were therefore obliged to light fires round the roots of them, and to cut away the charcoal as the fire eat into them.” These extracts not only show the very important part that fire played in all the Indians’ manufacturing operations, but even to-day they would be considered a very satisfactory account of the mode of “making a clearing,” as it

* Ancient Stone Implements of Great Britain, p. 209. Professor W. Boyd Dawkins on the Stone Mining Tools from Alderley Edge.

† Ancient Stone Implements of Great Britain, p. 163.

‡ History of the American Indians, p. 405. London, 1775.

§ History of Louisiana, Vol. II, p. 223. London, 1763.

is still practised on the frontier. Except in the material of which the axe is made, there has been but little improvement on the Indians' method of reclaiming the forest. It must not be supposed, however, that all the uses to which the axe was put were of this peaceful character. In the hands of a brave and skilful warrior, the smaller sizes became formidable as weapons, whether used simply as clubs, or thrown from the hand with the rapid whirling motion that made the tomahawk so exceedingly dangerous at close quarters.

Fig. 2, Plate VI, is a crescent-shaped implement of sienite, the ends drawn to a point, and resembles a bill or pointed mace, for which it may have been intended. Captain John Smith* says the Virginia Indians used "for swords the horn of a Deere put through a peece of wood, in forme of a Pickaxe. Some a long stone sharpned at both ends, used in the same manner." On the inner side of the crescent is a very slight groove or depression like those found in the axes and probably intended for the purpose of wedging it in the handle. Mr. Squier† figures a similar implement with a hole in the middle for the reception of a handle, but as it is of "soft and easily worked stone," thinks it was intended "not for use but for ornament or display." No such objection can be raised to the implement we have selected for representation. It is composed of one of the hardest, toughest materials known, and is of such a size and shape that if fitted with a strong handle, as could have been done by boring or otherwise, it might have been used in dealing a blow that no human force could withstand. That such a hole could have been bored into it hardly admits of a doubt. Professor Rau's‡ experiments on this point are conclusive; and though perforated axes are not so plentiful in this country as in Europe, yet enough of them are found to show that the aborigines understood the art of drilling or boring into the hardest materials. The same patience and labor that gave to this weapon its exquisite polish, would have sufficed to bore a hole into it large enough to receive a handle. It is proper, however, to say that but few of the axes of this kind are made of such materials or in such a manner as to be of any practical use whatever. As Mr. Squier remarked, they are almost always of a soft material, and the blade is usually so thin as to preclude all idea of their being intended for anything but ornaments, possibly badges of office.

* History of Virginia, p. 31. London, 1632.

† Ancient Monuments of the Mississippi Valley, p. 214. New York, 1848.

‡ Smithsonian Report for 1868, p. 392 *et seq.* Washington, 1872.

Messrs. Schoolcraft* and Jones† also figure implements of this kind, some of them of beautiful material and graceful form, the “amazon” or double-edged axe of Professor Nilsson‡ being among them. This specimen was found in a cave in Illinois, on the banks of the Ohio, by Mr. Elijah Orr, and now belongs to the Peabody Museum at Cambridge, to which it was given by Dr. N. B. Shaler of Newport, Kentucky.

Fig. 1, Plate VI, is a carved pipe of the mound-builder pattern, and represents the head of some fanciful animal. It is made of a highly metamorphosed clayey slate of a yellowish color; and in places, as for instance on the ear of the animal, it has a series of parallel lines of a darker color, the whole resembling very much the graining in a piece of yellow pine. This pipe is unusually large, and is given here on a scale of one half, being the only figure that is at all reduced. It measures $16\frac{2}{3}$ inches in length, $3\frac{3}{4}$ inches in height, and its weight is five pounds seven and one half ounces. The bowl is $1\frac{3}{8}$ inches in width. It was found embedded in the roots of a tree, and may be some hundreds of years old. It belongs to Mr. R. S. Munford of Rowlett's Station, Hart County, Kentucky, by whom it was kindly loaned for representation. There is also in the collection of the State Geological Survey a broken pipe of steatite, about half the size of this one, having very much the same head. In this latter specimen, the bowl shows unmistakably the marks of the tool with which it was dug out, the striæ being perpendicular and not circular, as they would have been if it had been bored out. There is also a second pipe of steatite in the same collection, with the same marks of digging in the bowl. Both of the pipes last mentioned were ploughed up, one in the neighborhood of the Haunted Cave in Edmonson County and the other near the Cumberland Ford.

Fig 1, Plate VII, belongs also to the collection of Mr. Munford, and is made of Catlinite from the famous Red Pipe Stone quarry of Minnesota. Its weight is $6\frac{3}{4}$ oz. The other measurements are omitted, as the figure is full size. There is in the Peabody Museum at Cambridge a very similar specimen both as to form and material, that was obtained from a mound near Columbus, Ohio. The presence of this material in the Ohio Valley, where it is found in connection with obsidian believed to be from Mexico§ and

* Condition and Prospects of the Indian Tribes of the United States, Vol. I, p. 77. Washington, 1872.

† Antiquities of the Southern Indians, p. 282.

‡ Primitive Inhabitants of Scandinavia, p. 71. Edited by Sir John Lubbock. London, 1868.

§ Ancient Monuments of the Mississippi Valley, p. 212.

shells from the Gulf, shows a certain amount of intercourse between the people inhabiting these widely separated regions, and the value that was placed upon it in the manufacture of pipes. Marquette* says the calumet † given to him by the Illinois Indians was of "polished red stone like marble"; and Du Pratz, ‡ though widely astray in his location of this quarry immediately on the banks of the Missouri, and in the Indians' manner of working it, is evidently speaking of the same material in the account he gives of "a thing curious enough to be related, and which is found on the banks of the *Missouri*; and that is, a pretty high cliff, upright from the edge of the water. From the middle of this cliff juts out a mass of red stone with white spots, like porphyry, with this difference, that what we are speaking of is almost soft and tender like sandstone. . . . This stone is easily worked, and bears the most violent fire. The Indians of the country have contrived to strike off pieces thereof with their arrows, and after they fall in the water plunge for them. When they can procure pieces thereof large enough to make pipes, they fashion them with knives and awls. This pipe has a socket two or three inches long, and on the opposite side the figure of an hatchet; in the middle of all is the boot, or bowl of the pipe, to put the tobacco in. These sort of pipes are highly esteemed among them."

Fig. 2, Plate VII, is a handsomely carved pipe, in the likeness of an owl, and belongs unmistakably to the mound-builder pattern. It was obtained from Mrs. Leonard Dunn, in Butler County, near the mouth of Big Bull Creek, by whose husband it had been ploughed up. In some places it shows the effects of hard usage and exposure, but it is not sufficiently injured to hide its polish or destroy its form. It is made of green steatite, a mineral not known to exist, *in situ*, within the limits of the State or nearer than North Carolina.

There are other pipes in the collection of the State Geological Survey, among them, one that had been cut into shape, but not yet bored out; but it is not thought necessary to figure them. The specimens given are believed to represent the very highest development of aboriginal art, in a department upon which "the utmost skill had been expended." § In describing this class of

* Narrative published in *Discovery and Exploration of the Mississippi Valley*, p. 35. By John G. Shea. New York, 1852.

† Mr. John G. Shea says we are probably indebted to Father Marquette for the addition to our language of this word. Note to p. 21, *Discovery and Exploration of the Mississippi Valley*. New York, 1852.

‡ *History of Louisiana*, Vol. I, p. 298. London, 1763.

§ *Ancient Monuments of the Mississippi Valley*, p. 243.

sculptures Mr. Squièr,* with pardonable enthusiasm, holds the following language: "The carvings from the mounds, on the contrary, are remarkable for their truthfulness; they display not only the general form and features of the objects sought to be represented, but to a surprising degree their characteristic expression and attitude. In some instances their very habits are indicated; the otter is represented securing a fish, so also is that inveterate fisher, the heron, and the hawk holds a small bird in his talons and tears it with his beak. These representations are so exact as to leave no doubt as to the animals designed to be exhibited. Hardly a beast, bird, or reptile indigenous to the country is omitted from the list. We identify the beaver, the otter, elk, bear, wolf, panther, raccoon, opossum, and squirrel; the hawk, heron, owl, vulture, raven, swallow, paroquet, duck, goose, and numerous other varieties of land and water birds; the alligator, turtle, toad, frog, rattlesnake, etc., etc." Captain John Smith,† speaking of the pipes in use among the Virginia Indians, says "his Tobacco Pipe" was "three quarters of a yard long, prettily carved with a bird, a Deere or some such devise at the great end, sufficient to beat out ones braines."

Adair‡ thus describes the pipes manufactured by the modern Indians: "They make beautiful stone pipes; the Cheerake the best of any of the Indians: for their mountainous country contains many different sorts and colors of soils proper for such uses. They easily form them with their tomahawks, and afterwards finish them in any desired form with their knives; the pipes being of a very soft quality till they are smoked with and used to the fire, when they become quite hard. They are often a full span long, and the bowls are about half as large again as those of our English pipes. The fore part of each commonly runs out with a sharp peak, two or three fingers broad, and a quarter of an inch thick — on both sides of the bowl, lengthwise, they cut several pictures with a great deal of skill and labor; such as a buffalo and a panther on the opposite sides of the bowl; a rabbit and a fox; and, very often, a man and a woman *puris naturalibus*. Their sculpture cannot much be commended for its modesty. The savages work so slow, that one of their artists is two months at a pipe with his knife, before he finishes it. . . . The stems are commonly made of soft wood about two feet long,

* *Aboriginal Monuments of the Mississippi Valley*, p. 59. New York, 1847. From *Transactions Am. Ethn. Society*, Vol. II.

† *History of Virginia*, p. 24. London, 1632.

‡ *History of the North American Indians*, p. 423. London, 1775.

and an inch thick, cut into four squares, each scooped till they join very near the hollow of the stem: the beaus always hollow the squares, except a little at each corner to hold them together, to which they fasten a parcel of bell buttons, different sorts of fine feathers, and several small battered pieces of copper kettles hammered, round deerskin thongs, and a red painted scalp. . . . They so accurately carve or paint hieroglyphic characters on the stem, that all the war-actions, and the tribe of the owner, with a great many circumstances of things, are fully delineated." In the above extract it will be noticed that the figures of animals are said to be cut *on* the sides of the bowl, and this would seem to confirm the somewhat arbitrary distinction claimed as existing between the sculptured pipes of the Mound-builders and those of the modern Indians. It is proper to say, however, that if this method of carving the figures *on* the pipe, was and is the rule among modern Indians, it is a rule that has had many exceptions; for specimens are by no means rare among their sculptures, in which the form of the animal is itself the pipe, and especially is this the case in all instances in which the human figure, either in whole or in part, is represented.

Of the value placed upon these articles, some idea can be formed from the following statement of Du Pratz,* who lived among the Natchez Indians just before their destruction by the French, about the year 1730: "The natives put as great a value upon a *Pipe of Peace*, as on a gun. Mine was adorned with tinsel and silver wire, so that in their estimation my pipe was worth two guns." Of the Indians' fondness for tobacco, Catlin † says: "There is no custom more uniformly in constant use among the poor Indians than that of smoking, nor any other more highly valued. His pipe is his constant companion through life,—his messenger of peace; he pledges his friends through its stem and its bowl, and when its care-drowning fumes cease to flow, it takes a place with him in his solitary grave, with his tomahawk and war-club, companions to his long-fancied, mild and beautiful hunting-grounds." Father Marquette,‡ speaking of the mysterious influence of the calumet, says: "Men do not pay to the crowns and sceptres of kings the honor they pay to it; it seems to be the god of peace and war, the arbiter of life and death. Carry it about you and show it, and you can march fearlessly amid

* History of Louisiana, Vol. I, p. 76. London, 1763.

† North American Indians, Vol. I, p. 235. London, 1848.

‡ Narrative of Father Marquette in the Discovery and Exploration of the Mississippi, p. 34, by John G. Shea. New York, 1852.

enemies, who even in the heat of battle lay down their arms when it is shown. . . . There is a calumet for peace, and one for war, distinguished only by the color of the feathers with which they are adorned, red being the sign of war. They use them also for settling disputes, strengthening alliances, and speaking to strangers." Father Charlevoix,* on the same subject, says: "Calumet is a Norman word, and means reed; and the Calumet of the Indians is properly speaking the stem of a Pipe; but the Pipe itself, as well as the stem, is usually included under this title. . . . It is the custom to smoke the Calumet when it is accepted, and perhaps there is no instance where an agreement made by such an acceptance has been violated. The Indians believe that the Great Spirit would not leave such a breach of faith unpunished. . . . In Trade, when an exchange has been agreed upon, a calumet is smoked in order to bind the bargain; and this makes it, in some manner, sacred. . . . There is no reason to doubt that the Indians, in making those smoke the Calumet with whom they wish to trade or treat, intend to call upon the Sun as a witness to, and in some fashion, as a guaranty for their Treaties; for they never fail to blow the smoke towards that Star. . . . To smoke then the same Pipe in token of friendship, is the same thing as to drink from the same Cup, as has been the custom among many Nations at all times."

ON THE SOURCE AND DISTRIBUTION OF THE STONE IMPLEMENTS OF KENTUCKY.

THE implements of stone or metal, belonging to an extinct people, have a considerable value as a basis on which to determine the traffic or migrations of their makers, and the relative mineral distribution in different regions. Many of the mineral species, represented in these tools, can usually be traced back to their sources, and so the extent of intercommunication ascertained; in all cases, the relative number of the stone remains in each district can be fixed with an approximation to accuracy, thus determining the numbers of people who have lived upon the soil. The truth of these propositions is, in a general way, clear; their value will be seen after our examination of the Kentucky stone implements. In Kentucky, as in most if not all other regions, the stone implements of the most general use — such as spears, arrows, etc.—

* Voyage dans l'Amerique, Vol. V, pp. 311, 312. Paris, 1764.

are derived from the country itself; the articles of rarer utilization—well-shaped axes, utensils of sacred office, articles of ornament, etc.—are oftener of exotic origin. In this district, as in all North America and Europe, the tips of arrows and spears, or the fragments made in their production, constitute quite ninety-nine per cent of the total implement remains of the ancient people. The reasons for this are obvious: these tools must form a large part of the art work of a people living by the chase; while a savage will have some score of arrows, his other implements will be very limited in number; moreover, these tips of projectile weapons run a thousand times the risk of breakage and loss that is incurred by the other class of tools. Any one can readily form an idea of the risk of breaking that limits the endurance of a flint arrow-head by remounting it and putting it to its rough use. In stony ground almost every flight will cause it some damage. It is this rapid wear of flint-points that makes it necessary that they be derived from some locality near at hand. In Kentucky the sources of supply of workable flints are few and poor, poorer perhaps than in any other State in the Ohio Valley. The impossibility of obtaining flints, thoroughly well adapted to the varied needs of the implement-makers of the ancient Ohio Valley people, is sufficient to account for any inferiority of workmanship which may be observed in their work, when compared with that of the races on other continents. The flints of the Ohio Valley, and of America as a whole, are far inferior to those of Europe in their fitness for tool-making. The sources of supply are fewer, and the masses generally of small size, poor grain, and much cut by joints.

The rocks of Kentucky afford but two distinct flint horizons. The lowest of these is in the beds supposed to be equivalent to the Niagara series. In Kentucky these beds held a large amount of cherty matter, rarely with a good fracture for working, and never found in large undivided masses. East of Lexington, this horizon was the sole source of flints, and it was a good deal worked about Mount Sterling, where a very fertile soil comes close to this poorer soil, giving beds of the Silurian. The ancient pits, where the aborigines dug these stones, form a prominent feature in the antiquities of the country, and are liable to great misinterpretation. The imaginative Raffinesque has described one of these sets of flint pits as the ruins of an ancient city. The rather regularly arranged depressions were taken for foundations; and the masses of stone heaped up in the selection of the flints, for the ruins of walls. Generally, however, the flints were found among the detritus of the rocks of the Silurian age (Niagara), which abounds on the top of several of the higher hills

in the district between Montgomery, Garrard, and Shelby Counties, enduring long after the deposit whence they were derived has become completely disorganized by erosion. It is interesting to note how little of this material, now found in this district, seems fit for working. One may often search over the surface of an exposure without finding a piece fit for a large arrow or spear head. It is not easy to say whether this exhaustion of good flint is, to any extent, the result of the continued search of the ancient peoples; but it is clear, that they were driven to what must have been to them very difficult excavations to get suitable materials for their work. The outcrop of these beds makes a great circuit from the Ohio River in Lewis County, through the counties of Lewis, Fleming, Rowan, Bath, Montgomery, Estill, Madison, Garrard, Boyle, Lincoln, Marion, Nelson, and Breathitt, to the Ohio again below Louisville. It also is found, as remnants, in many other counties nearer Lexington.

From this level it is likely that the flint, for the smaller points alone,—those from three inches in length downwards,—was gathered. All of the tips, made from this material, must have been of rather poor quality.

The next and last productive flint horizon in the State is that belonging to the Subcarboniferous series, near the base of, what is probably, the St. Louis group of rocks. Here the flint occurs in larger masses, and can often be had with little digging. The erosion of caverns and furrows has left much of it exposed upon their floors and sides, and the amazingly extensive explorations made by the ancient tribes in all the caves was probably, in part at least, due to their search for workable flints. In Breckinridge and other counties it is common to find patches of flints, every piece shattered by the testing blows of the old workers, and the neighborhood littered over with these abortive results. The whole of this Subcarboniferous district abounds with evidences of Indian occupation, and is particularly rich in arrow-heads of the best patterns.

The second class of stone implements, those other than the tips of projectiles and stone knives, is composed of materials of a very diverse description and of a wide range of derivation. In this great variety we may trace the following important and often-recurring rocks which clearly were derived in some continuous manner from the same districts: (*a*) a dense milky white or yellowish quartz, used for making discs and various other curious objects; (*b*) a close-grained diorite, always carefully worked, used for making chisels and axes; (*c*) a steatite or soapstone, quite rare, used

for pipes and vases; (*d*) a dense banded claystone, used also for pipes (see Plate VI, Fig. 1); large flakes of mica, most abundant near Cumberland Gap, used solely for ornament; copper discs, bracelets, etc. None of these substances are found within the State, and all of them are to be sought in either of two regions,—the district of ancient rocks north of the great lakes, or in the old rocks of the Carolinian division of the Appalachian mountain-system. A large part of these stones, especially the harder jaspery materials, has doubtless been derived, at second-hand, from the drift deposits found along the banks of the Ohio River and in the district to the north. The finer diorites, the steatites, mica and some other substances have probably been derived from the mountain district of the Carolinas. The stone implements generally, properly speaking, do not require a wider range than this, for the localities whence they may have been derived. The Catlinite, or “red clay,” pipes are very rare in Kentucky, and are not found under circumstances indicating, with certainty, any great antiquity. It is likely that the more ancient tribes knew nothing of it, and that it was only brought here by comparatively recent migrations. In very many cases the stones, whence the commoner axes were made, were doubtless taken from the drift deposits along or north of the Ohio River. The larger part of the dioritic rocks, the milky quartz, and other similar substances probably had this origin. The implement-maker would soon find that these stones are a careful natural selection of the most even-grained and tough fragments of rock. In all or nearly all cases a pebble was doubtless the shape in which the stone was taken by the savage for his work. The rough usage that it had been subjected to in being made a pebble, is the best possible test of its fitness for the purposes of the tool-maker. Most of the stone hatchets, scrapers, etc., are doubtless from these glacial pebbles.

The pipe clays and stones are even more generally exotic than the hammers and other useful tools,—following the general rule that the more ornamental and least used articles are most apt to be derived from foreign parts. There are many substances in the State fairly well fitted for making pipes, but all that I have seen have clearly proved distant origins. The following is something like the order of abundance and probable origin of the several stone implements: Flint arrow and spear heads, nearly all from native rocks, at least ninety per cent of the whole number; working hatchets, scrapers, etc., nearly all native glacial pebbles, at least five per cent; pipes and pots (generally steatite), discs and ornamental axes, generally

derived from a distance, not more than one per cent and possibly not more than one tenth of one per cent of the whole number of perfect stone tools.

The distribution of the remains throughout the State is presumably a fair criterion of the extent to which the several regions were occupied by the ancient tribes. Data for the accurate determination of this point do not exist, but during some years of journeying within the State, with this point kept in mind, the following conclusions have been reached :—

The eastern Carboniferous district, including nearly eleven thousand square miles, — one fourth of the State, — is comparatively destitute of stone implements; a strip along the Ohio, and the old path to Cumberland Gap, are moderately rich in such remains; but the rest of that area may be said not to have one flint where other regions have a hundred. The western coal-field, on the other hand, is, though not rich, much more abundantly furnished with such relics. The regions in which these remains are most abundant are the limestone districts of the State, — the blue or Cambrian limestone, and the subcarboniferous limestone of Central and Western Kentucky. It will be readily noticed by the traveller that abundant remains are always associated with good lands or good permanent streams. Thus along the banks of all our large rivers, especially the Ohio, such remains are found in great numbers; and the district about Lexington, though remote from permanent streams of any size, is very fertile, and abounds in evidences of long-continued occupation. Although not conclusive, these circumstances of distribution suggest a people dependent in part, at least, on agriculture, and in part on fishing.

ON THE ANTIQUITY OF THE STONE IMPLEMENTS OF THE KENTUCKY DISTRICT.

This investigation has been but begun, and little can be done besides indicating the line in which investigation should be carried on. The only deeply buried remains yet found have been in recent mud alluvium along the banks of our larger rivers. Years of search, on the part of the director of the Survey among the river gravels, have failed to show a single indication of great antiquity. In our caverns the search has been but begun, yet there have been a good many sections made through their floors, so far with a negative result. At Big Bone Lick the excavations have failed, as yet, to

show a trace of man along with the extinct mammalia of the country. Altogether the indications are not in favor of a great antiquity of man in this district, but it is not yet time to form a final opinion on this point.

The following line of research is proposed as a basis for a further inquiry into the data on which this question is to be settled, namely:—

1st. The search into our river gravels, especially the higher terraces of the valley.

2d. The search into our caverns, especially the higher levels of caves, with the view of determining the association with extinct species.

If after some years of exploration on these two lines, no evidence, other than negative, is obtained, it will then be time to accept the theory of the recent coming of man into this district. With the Californian discoveries in view, however, this opinion would, even then, be much in doubt.



PLATE I.

Figs. 1, 2, 4, 5. Arrow-heads of chert.

Figs. 3, 6, 7. Spear-points.



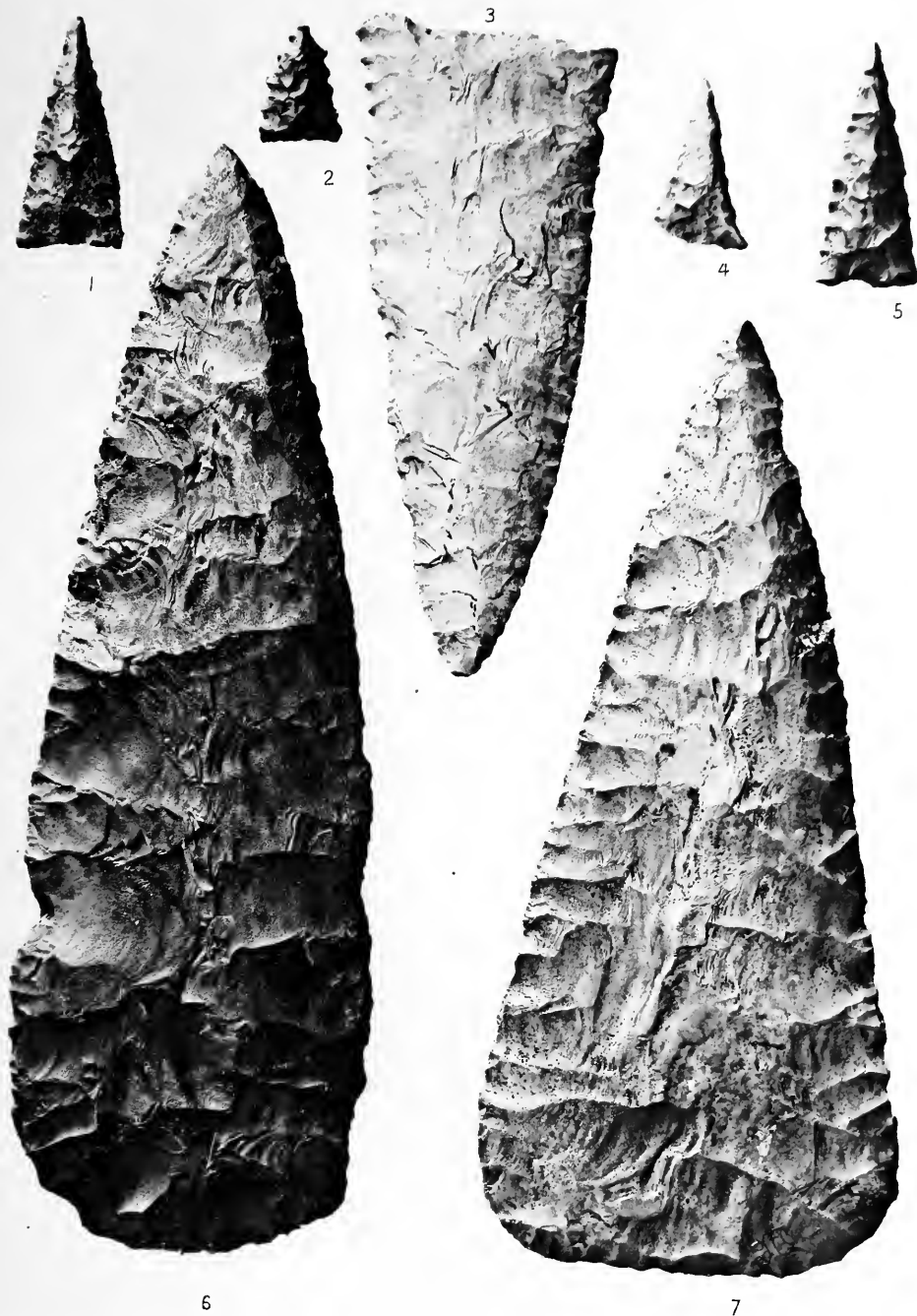
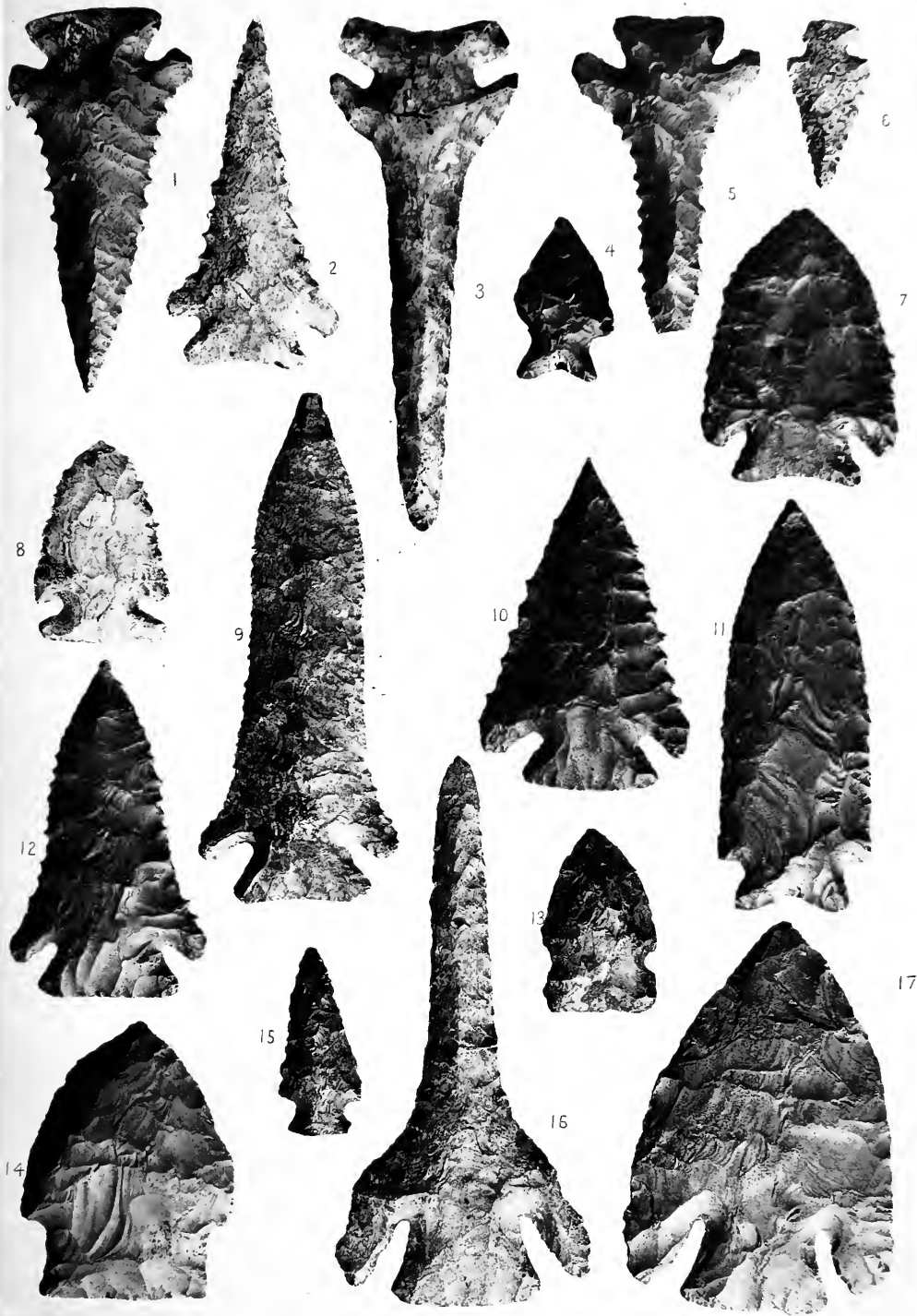


PLATE II.

Arrow-heads and spear-points of chert.



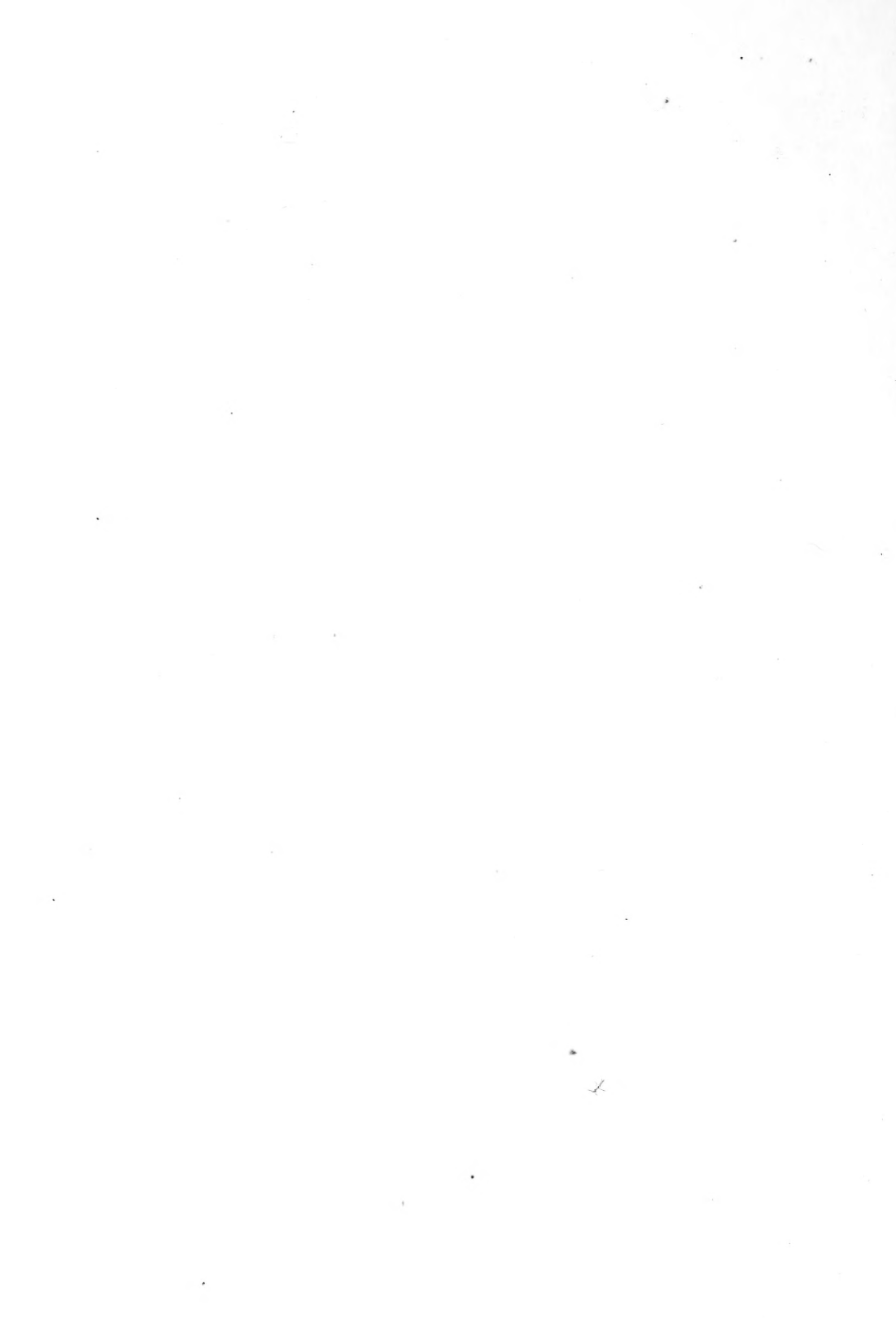


PLATE III.

Figs. 1, 3, 4, 5. Arrow-heads.

Figs. 2, 6. Knives or spear-points.

Figs. 7, 12. Scrapers.

Figs. 11, 13. Scrapers.

Figs. 8, 9, 10. Rotary arrow-heads.

Figs. 14, 16. Knives.

Fig. 15. Knife or arrow-head.



PLATE IV.

- Fig. 1. Bone awl.
- Fig. 2. Ornament of "ribbed" slate.
- Fig. 3. Knife.
- Fig. 4. Implement of hematite.
- Fig. 5. Implement of quartz.
- Fig. 6. Scraper of greenstone.
- Fig. 7. Ornament of diorite.



1



2



3



4



5



6



7

PLATE V.

Grooved axe of greenstone.



PLATE VI.

Fig. 1. Pipe of indurated clay slate.

Fig. 2. Implement of sienite.

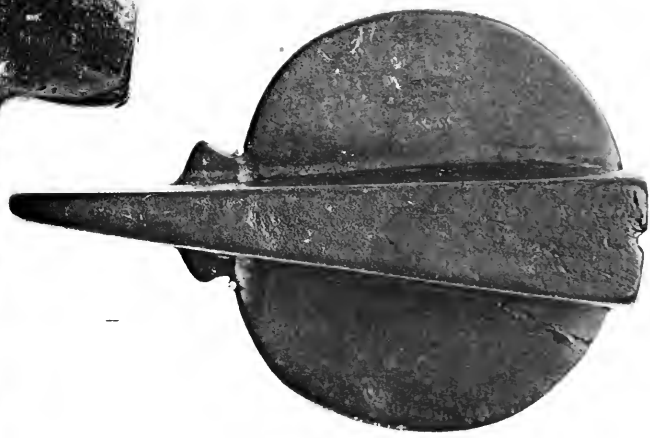




PLATE VII.

Fig. 1. Pipe of catlinite.

Fig. 2. Pipe of steatite.



1



2

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