IV.

NOTICE OF A COLLECTION OF ARROW AND SPEAR HEADS, &c., FROM ALABAMA, UNITED STATES, RECENTLY PRESENTED TO THE MUSEUM. By GEO. F. BLACK, Assistant in the Museum.

Through the kindness of Mr James Brodie, of Huntsville, Alabama, the National Collection has recently been enriched with a large and valuable collection of chipped stone implements of various types, but mostly Arrow and Spear Heads. These implements were all collected on the site of an old Cherokee encampment in North Alabama, and were probably made by the Cherokees before their migration to the west of the Mississippi in the early years of the present century.[1]

The collection, which numbers about 600 specimens, includes nearly all the types of Arrow and Spear Heads, Perforators, Scrapers, Leaf-shaped Implements, &c., figured by the late Dr Charles Rau in his memoir on *The Archæological Collection in the United States National Museum*.[2]

The materials of which the chipped stone implements found in North America are formed are chiefly chert, hornstone, quartz, jasper, chalcedony, and one or two other kindred materials—pure flint seldom, if ever, being found.[3] In Mexico the commonest material used was obsidian or volcanic glass,[4] a material which was also used by the Indians inhabiting the region north of Mexico, and which has also

[1] The implements were collected within a small area of the tract of land ceded by the Cherokees to the United States in 1806. See memoir on "The Cherokee Nation of Indians" by C. C. Royce, in the *Fifth Annual Report of the Bureau of Ethnology*, pp. 129–378.

[2] Published by the Smithsonian Institution, Washington, D.C., 1876.

[3] Schoolcraft, *Indian Tribes*, vol. i. p. 78; Rau, *l.c.*, p. 3; Stevens, *Flint Chips*, p. 565.

[4] In the Edinburgh Museum of Science and Art there is a very fine arrow head of translucent chalcedony, which was found on Brown's Ranche, Duval County, Mexico. It is of the type with straight sides, deep side-notches, and in-curving base with straight extremities. It measures $1\frac{1}{4}$ inch in length by $\frac{11}{16}$ inch across the widest part of the base, and is very finely chipped.

been found in a worked state in a number of the ancient mounds in Ohio and elsewhere in the Mississippi valley.[1] In South America the materials used were chiefly chalcedony, agate, quartz, and jasper.[2] In Terra del Fuego again, obsidian was the most commonly used material,

[1] Rau, *Smithsonian Report*, 1872, p. 357; Peschel, *Races of Man*, p. 430. Implements of obsidian have been found in several other countries besides those mentioned in the text. Many of the arrow-heads found in California are of obsidian, as are also the curious semicircular spear-heads from Easter Island (fig. 5), the spear-heads of the Admiralty Islanders (*Narrative Chall. Exped.*, vol. i. pt. ii. p. 717), and the small knives lately used by the New Zealanders (specimens in the National Museum of Antiquities). Flakes and chips of obsidian have been found in burial caves in the Canary Islands (specimens in the Edinburgh Museum of Science and Art). Many of the arrow-heads found in Japan are also of obsidian (specimens in the Museum of Science and Art and in the National Museum). Flakes and cores of the same material have been found in Greece and the adjacent islands (specimens of flakes from Marathon in the National Museum; see also *Congrès International d'Archéologie*, Brussels volume, pp. 336, 337). Dr Schliemann also found implements of obsidian on the different sites excavated by him. In the fourth sepulchre at Mycenæ he found thirty-five beautifully formed arrow-heads of this material, fifteen of which he figures (*Mycenæ and Tiryns*, p. 272). They bear a close resemblance to the Irish leaf-shaped form with hollow base, and also to the common Danish and Scandinavian forms. At Tiryns chips and flakes of obsidian were found, eight of which are figured by Schliemann as arrow-heads and two-edged knives, but, judging from the illustrations, they show no secondary working (*Tiryns*, p. 174). Flakes and chips were also found at Hissarlik (*Ilios*, pp. 247, 445). In Hungary obsidian flakes, cores, and arrow-heads are said to have been found (*Cat. de l'Exposition prehist.*, Budapest, par le Dr Hampel, pp. 19, 24, 28, 34, &c.; also *Congr. Int. d'Arch.*, Budapest, vol. ii. pp. 6–17). A knife of obsidian, found on the site of a lake dwelling at Seewalchen, in the Atter See, Upper Austria, is described by Keller (*Lake Dwellings*, vol. i. p. 621). Dr Munro, in his *Lake Dwellings of Europe* (pp. 163, 167, 168, 193), also refers to the finding of chips and flakes of obsidian on the sites of lake dwellings; and he figures a flake which was found with twenty-nine others on the site of a lake dwelling in the Lake of Varese, North Italy (fig. 48, No. 4, p. 191). Flakes of obsidian have also been found in the Terramaras of Italy. The Rev. G. R. Buick, M.A., of Cullybackey, Antrim, informs me that flakes and cores of obsidian have been found in Ireland, but they may probably be of pitch-stone. Several small cores, flakes, and chips of this latter material have been found in the sands at Glenluce, Wigtownshire, and might readily be mistaken for obsidian.

[2] A paper on arrow-heads and other implements from Patagonia by Col. Lane-Fox (now Gen. Pitt-Rivers) is printed in the *Journal of the Anthropological Institute*, vol. iv. pp. 311–323, plates xxiii. and xxiv.; see also *Proc. Soc. Ant. Scot.*, vol. i., N.S., pp. 105–107. Nadaillac, *Prehistoric America*, pp. 27, 28, 55, figures two wretched specimens and three chips as types of arrow-heads from Patagonia. On

though recently the natives have made considerable use of fragments of common bottle glass.

Although no great distinction can be drawn between the different varieties of implements, yet for convenience of description we may divide the collection as follows:—

1. Arrow Heads.
2. Spear Heads.
3. Perforators.
4. Dagger-like Implements.
5. Leaf-shaped Implements.
6. Knives and Scrapers.
7. Miscellaneous.

In discussing the classification adopted in the United States National Museum, the late Dr Rau says: "Collectors, for instance, are very ready to class chipped stone articles of certain forms occurring throughout the United States as arrow and lance heads, without thinking that many of these specimens may have been quite differently employed by the aborigines. Thus the Pai-Utes of Southern Utah use to this day chipped flint blades identical in shape with those that are usually called arrow and spear points, as knives, fastening them in short wooden handles by means of a black resinous substance.[1] . . . . On the other hand, the stone-tipped arrows still made by various Indian tribes are mostly provided with small slender points, generally less than an inch in length, and seldom exceeding an inch and a half,[2] as exemplified by

arrow-heads from Chili, see *Proc. Soc. Ant. Scot.*, vol. x., N. S., pp. 109, 110; from Peru, *ibid.*, pp. 164–166; and *Matériaux pour l'Histoire de l'Homme*, vol. xiv. pp. 382, 383. On arrow-heads and other implements from the Argentine Republic, see *Congrès International d'Archéologie*, &c., Stockholm volume, pp. 277–283; and for arrow-heads and stone axes from Chiriqui, Central America, see *Sixth Annual Report of the Bureau of Ethnology*, pp. 29–34, and *Matériaux*, vol. iii. pp. 101, 102.

[1] An implement of the kind here mentioned, from the same locality, is in the Collection of the Earl of Northesk, and was exhibited with his Collection in the Edinburgh Museum of Science and Art some years ago. The stone head is of oval pointed shape, 3¼ inches in length by nearly 1½ inch in greatest breadth, and is mounted in a wooden handle 4½ inches in length.

[2] Schoolcraft (*Indian Tribes*, vol. i. p. 77) says the smallest or boys' arrows do not exceed, but often fall below, one inch in length, and that the ordinary arrow-heads range from this to 3¼ inches. Col. Long (quoted in *Smithsonian Report*, 1885, p. 884) states that "two inches was the greatest length of stone arrow-heads that he found in use among the Indians; that all longer not used for javelin and spear-heads were strongly mounted and used as cutting implements."

many specimens of modern arrows in the Smithsonian Collection. If these facts be deemed conclusive, it would follow that the real Indian arrow-head was comparatively small, and that the larger specimens classed as arrow-heads, and not a few of the so-called spear-points, were originally set in handles, and were used as knives and daggers. In many cases, further, it is impossible to determine the real character of small leaf-shaped or triangular objects of chipped flint, which may have served as arrow-heads or either as scrapers or cutting tools in which the convex or straight base formed the working edge. Certain chipped spear-head-shaped specimens, with a sharp straight or slightly convex base, may have been cutting implements or chisels. Arrow-heads of a slender elongated form pass over almost imperceptibly into perforators, insomuch that it is often impossible to make a distinction between them."[1]

Arrow and Spear Heads.

The Arrow and Spear heads found in the United States are divided into several varieties according to their most prominent peculiarities, but, as has been pointed out by the late Dr Rau,[2] any such arrangement must be arbitrary, to a great extent, owing to the many intermediate forms in which the distinguishing peculiarities are wanting. Under these circumstances it has been thought best in the present paper to unite the two types.

1. Arrow heads of triangular form, mostly with concave sides and straight or slightly hollowed base. Of this class—without doubt, true arrow heads—there are twelve specimens, all imperfect at the points, and ranging from $\frac{3}{16}$ inch to $1\frac{5}{16}$ inch in length. In one or two specimens the sides are straight, giving the specimen almost the form of an isosceles triangle. Arrow heads of the same size and form, differing only in material, have been found in Great Britain, Ireland, Switzerland, Italy, and Japan.

2. Arrow heads of triangular form, with straight or slightly convex sides, and straight or hollow base. Of this type there are fourteen specimens of a slightly larger size than those already mentioned, and

[1] *Cat. Arch. Coll.*, p. 2. [2] *Ibid.*, p. 9.

likewise mostly imperfect. The finest is of milk-white agate, streaked with pale blue and pink.

3. Arrow heads with slightly convex sides, notched on each side near the base, which is straight. Nine specimens.

4. Arrow heads with straight or slightly convex sides, notched on either side near the base, which is mostly hollow or excavated. In a few specimens the base is straight and broad in proportion to its length. The specimens of this type so gradually merge into several of the types described below that it is sometimes difficult to distinguish them. Forty-five specimens may, however, be classed as of this form.

5. Arrow heads with slightly convex sides and expanding stem, with straight base. In size the specimens of this type range from $1\frac{1}{16}$ inch to $2\frac{1}{8}$ inches in length, but the majority average $1\frac{1}{2}$ inch. The stems are broad and thick, and the bodies narrow in proportion to their length, so much so, in some cases, as to almost approach the borers in form. Many of the smaller specimens are roughly serrated on the sides. Eighty specimens of this type.

6. Arrow heads with convex sides and expanding stem, with concave or hollowed base. The specimens of this class so gradually merge into the two types just described (Nos. 4, 5), and into the class with bifurcate stem, described below (No. 9), that it is often difficult to divide them. Eleven specimens.

7. Arrow heads or Spear heads with slightly convex or straight sides, and stem with straight or convex base. The average size of the specimens of this class is about $2\frac{1}{4}$ or $2\frac{1}{2}$ inches in length by $1\frac{3}{4}$ inch in breadth. A good number are well made, but the majority are roughly chipped, due to the splintery nature of the material used. Two or three are also serrated on the sides. A few of the specimens are also remarkable for the great width of the stem, which, in two or three instances, is as much as 1 inch. One very fine specimen of flint-like material, $2\frac{1}{4}$ inches in length, has a stem $1\frac{1}{16}$ inch in width. In a number of the specimens, again, the points are so rounded that the implements might have been classed with those described in section 15. The only difference is, that the specimens in section 15 are bevelled from one face only to a sharp cutting edge at the point, whereas the

specimens included here are worked to an edge from both faces. Although classed as Arrow-heads and Spear-heads, it is very probable that a considerable number, if not all, of the specimens included here, were intended for mounting in short handles to be used as knives, as already mentioned. This conjecture is in part confirmed by the explorations in Ohio, carried out by the Peabody Museum of American Archæology, under the superintendence of the Curator, Professor F. W. Putnam. In a mound on the Little Miami River, along with numerous objects in stone, bone, and copper, there was found a handle made from the point of an antler of a deer, with a groove cut across its widest end, in which was fastened a roughly triangular-shaped "arrow-head" of chert, $1\frac{1}{2}$ inch in length.[1] This class is the most numerous in the collection, and numbers one hundred and ninety-four specimens.

8. Arrow-heads and Spear-heads with slightly convex sides, large, strong, down-pointing barbs, and slightly expanding stem, with straight or convex base. In two or three specimens, however, the base is concave. In length these implements range from $1\frac{7}{8}$ inch to $3\frac{1}{4}$ inches, the majority being between $2\frac{1}{2}$ and 3 inches in length. Thirty specimens. A very fine but unfortunately imperfect specimen of this type, found in Franklin County, Missouri, is also in Mr Brodie's Collection, and is the only one not from Alabama. It measures $3\frac{9}{16}$ inches in length by $1\frac{1}{4}$ inch across the barbs (one of which is broken off), and is slightly curved longitudinally. The secondary working is so minute and regular that the implement may rank as the finest in the collection.

Fig. 1. Arrow-head with Bifurcate Stem ($\frac{2}{3}$).

9. Arrow-heads with bifurcated stems and more or less prominent barbs. Of this not very common type there are ten specimens, two only of which are in any degree perfect. The finest is shown on a scale of two-thirds in fig. 1. An additional specimen, $1\frac{1}{4}$ inch in length, with two barbs, is the only specimen in the collection which approaches to the common British type with barbs and stem. The

[1] *Reports Peabody Museum*, vol. iii. p. 457.

only difference is a small notch in the base of the stem, which gives it the appearance of being very slightly bifurcate.

10. Arrow-heads or Spear-heads of leaf-shaped form, some with almost straight base. In a few the sides sink in a little near the base. Twenty specimens. A curious specimen, which may also be included here, resembles an inverted Y. The point is unfortunately broken.

11. Arrow-heads with convex sides and rounded tapering stem. Two specimens. Another specimen has straight sides and converging stem.

12. Spear-heads with ogival sides and concave base. This type, which is apparently not very common in America, is not mentioned by Rau. There are, however, four specimens in the collection from Alabama, the largest of which is $3\frac{5}{8}$ inches in length and has the barbs pointing outwards.

13. A very fine, though imperfect, specimen of a spear-head, 3 inches in length, has fine crimping along each side very similar to that on the Danish and Scandinavian flint daggers. In an interesting paper on "Stone Chipping among the North American Aborigines,"[1] Mr G. E. Sellers attempts to confute the opinion of European archæologists who hold that the crimping on the Danish and Scandinavian flint daggers is intentional. Mr Sellers, however, has been misled by the irregular working observable on the larger specimens of American chipped implements, between which and the fine crimp-work on the Danish and Scandinavian specimens there is no comparison. The specimen here described from Alabama is the first American example that has come under my observation.

14. In addition to the ordinary varieties of American Arrow-heads and Spear-heads which are worked on both sides on each face, there is another type which is bevelled along both sides on opposite faces, so as to form in the cross-section a figure resembling a long-stretched rhomboid, presenting sharp cutting edges at the acute angles. The significance of the bevelled sides is not known, and it has given rise to a good deal of discussion among American archæologists. Dr J. W. Foster[2] and others have suggested

[1] *Smithsonian Annual Report*, 1885, p. 880.

[2] *Prehistoric Races of the United States*, p. 206; Abbott, *Primitive Industry*, p. 265; *Proc. Soc. Ant. Scot.*, vol. i. (1852), p. 85, &c.

that the bevelling may have given the arrow a rotary motion when discharged. On this point Mr Sellers, in his paper already quoted, says:[1] "I have met many that accept this idea, unmindful of the fact that a ship is not steered at its stem, but by the rudder at its stern, and an arrow is not directed or held to its course by its point, but by the feathers at the butt end of its shaft; and if a rotary motion was required it would naturally be given by placing the feathers spirally round the shaft. The broad flat sides of these bevelled points would neutralise any effect from the short bevels in passing through the air." Mr Sellers thinks the bevelling is merely due to the ease with which the implements can be manufactured. Among all the points, he says, "we find they are the simplest and easiest to form when laid on their flat." Professor M. C. Read[2] suggests that the type "may be the result of the peculiar character of the material, the symmetrical bevelling being determined by the position in which the object was held when chipped. Or, if designed, the object may have been to get a stronger cutting or scraping edge that would result from a flatter chipping." This latter suggestion seems to me the most likely explanation. The bevelled type includes a number of different forms, but the commonest is that with expanding stem, with truncated or slightly hollowed base. They are mostly of a large size. Twenty-nine specimens.

Fig. 2. Round-pointed Implement ($\frac{1}{2}$ inch scale).

15. There are eight implements in the collection which may be looked upon as holding an intermediate position between the stemmed arrow and spear-heads and the tanged scrapers (see fig. 2, which is the finest and is half size). These implements, of which three are imperfect, range in length from $1\frac{1}{2}$ to $3\frac{1}{4}$ inches in length. As already mentioned, these implements are bevelled from one face only to a sharp cutting edge at the point and sides. If not scrapers or chisels, they may

[1] *Loc. cit.*, p. 884. It should be mentioned, however, as lending some support to the theory, that the iron heads of the arrows used by some modern savage tribes have the barbs bent to the right and left. See also the Norwich volume of the *International Congress of Prehistoric Archæology*, p. 77, for some additional remarks on this subject by Col. Lane Fox (now General Pitt-Rivers).

[2] *Archæology of Ohio*, p. 17.

be analogous to the semicircular arrow-heads made by the Blackfeet Indians out of hoop-iron, and with which it is said a skilful marksman will behead a bird on the wing.[1] The Rev. J. P. MacLean[2] states that rounded arrow-heads similar to those here described are used by the Indian boys of Canada when they are beginning to learn the use of the bow.

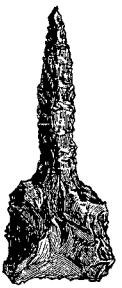

Fig. 3. Perforator ($\frac{1}{2}$ inch scale).

Perforators or Borers.

Of the implements known as perforators or borers there are forty-seven specimens in the collection from Alabama, only about a dozen of which are perfect. In many instances it is difficult to distinguish between perforators and slender arrow or spear-heads, so that in all probability a few perforators may have been included among the latter. One of the finest of the perforators, the stem of which expands into a disc shape, is well adapted for holding between the fingers. Some of the others would appear to require a handle or socket before they could be of service. Two or three show slight traces of bevelling. A typical specimen, capable of being held between the fingers, is shown half size in fig. 3.

Dagger-like Implements.

There are three specimens in the Collection to which the name of dagger-like implements may be applied. One of these is of chert, in the form of an isosceles triangle, with slightly rounded base and bevelled sides. It measures $5\frac{7}{16}$ inches in length by 2 inches in breadth across the base, and shows very fine working on each face. The butt of another implement of the same form, but of a slightly larger size, is also in the collection. It is not bevelled on the sides like the perfect specimen.

The second perfect specimen is of blackish chert, and measures $4\frac{3}{4}$ inches in length by 2 inches across the base, which is slightly convex.

[1] *Prehistoric Man*, vol. i. p. 86.

[2] *The Mound Builders*, p. 160.

The chipping is rough, but this is due more to the nature of the material than to the workmanship. An almost identical specimen, 5 inches in length, found in New Jersey, is figured by Dr C. C. Abbott as a knife.[1]

The third specimen is of dark brown hornstone, bevelled on the sides, $5\frac{1}{8}$ inches in length by $1\frac{3}{16}$ inch across the base, which is truncated and has a small notch in the middle. The chipping is very regular, and the point is slightly imperfect.[2]

Attention may here be drawn to a very rare type of implement found in the United States, approaching in form the daggers of chipped flint found in Denmark and Scandinavia. Only three specimens are known to me. The finest of the three was found in a mound on Warrior River, in Alabama, and is now preserved in the United States National Museum.[3] It is of grey flint-like stone, $7\frac{1}{4}$ inches in length, of which the blade is $3\frac{3}{8}$ by $2\frac{1}{8}$ in greatest breadth. The

[1] *Primitive Industry*, p. 83.

[2] In the seventh volume of the *United States Geographical Survey West of the 100th Meridian*, several very fine dagger-like implements from California are figured on plates i. and ii. Four specimens are given on plate i., the largest of which is $9\frac{1}{2}$ inches in length, pointed at one end and rounded at the other, to which a quantity of the asphaltum by which the handle was attached still adheres; on plate ii. are three specimens, which are slightly broader than the others—one is $7\frac{1}{2}$ inches in length, and the other two $8\frac{1}{2}$ inches respectively, and all three are hollowed in the base and have the sides curving slightly inwards. Some of the type of the first four have been found in shell-mounds in Oregon, and measure from 8 to 15 inches in length, the largest of which are pointed at each end (*ibid.*, p. 50). The Rev. Stephen Powers, in his *Indian Tribes of California*, p. 79, says:—"I have seen several [of these knives] which were 15 inches or more in length, and about $2\frac{1}{2}$ inches wide at the widest part. Pieces as large as these are carried aloft in the hand in the dance, wrapped with skin or cloth to prevent the rough edges from lacerating the hand, but the smaller ones are mounted on wooden handles and glued fast. The large ones cannot be purchased at any price, but I procured some, about 6 inches long, at two dollars and a half a-piece. These are not properly 'knives,' but jewelry for sacred purposes, passing current also as money." Mr Powers figures several of these implements on a small scale on p. 53.

[3] *Cat. Arch. Coll.*, p. 15. Worsaae reproduces the illustration in his memoir, "Des âges de pierre et de bronze dans l'ancien et le nouveau monde" in the *Memoires de la Société Royale des Antiquaires du Nord*, 1878–83, p. 172; also in *Matériaux pour l'Histoire primitive de l'Homme*, vol. xvii. p. 126.

handle is 1 inch in breadth, expanding to 2 inches at the free end.

The other two specimens were found in Missouri, but I do not know where they are preserved. One of these is of the same form as the Alabama specimen, but measures only $5\frac{1}{2}$ inches in length. The other is $7\frac{1}{2}$ inches in length, of which the leaf-shaped blade is $4\frac{3}{4}$ inches by $1\frac{3}{4}$ inch in greatest breadth, and the handle of an even width of three-quarters of an inch.[1]

Leaf-shaped and other Implements.

Of implements of leaf-shape, of triangular with rounded angles, and oval-roundish forms, there are thirty-nine specimens. A few of these are finely formed, but the majority are roughly finished. The use of the most of these implements is explained by a discovery made some years ago in the burial-caves of Coahuila, in the north-east of Mexico. In the course of the explorations, Dr Edward Palmer[2] discovered a number of mummies, in the wrappings of which were several large thin and well-made blades of flint fastened to short wooden handles by means of a tenacious substance supposed to have been obtained from the cactus. The stone heads range in size from $3\frac{1}{2}$ by $2\frac{1}{2}$ inches to 7 by $3\frac{1}{2}$ inches, and the handles from $5\frac{1}{2}$ to 8 inches in length. In a number of the ancient Indian graves near Santa Barbara, California,[3] similar hafted specimens have been found. Prof. Putnam of the Peabody Museum, in a memoir on "Chipped Stone Implements,"[4] figures several of the hafted implements from Coahuila and Santa Barbara on a scale of one-half, and describes them as forming "a very interesting addition to our knowledge of at least one of the methods of mounting the large chipped points, and they also show that not all such points were spear-heads." Several of the specimens from Alabama are so thick that they could almost serve for axes if mounted in suitable handles.

[1] Read, *Archæology of Ohio*, pp. 14, 15.

[2] *Reports Peabody Museum*, vol. iii. p. 233.

[3] The specimens from this place are figured the full size on plate iv. of vol. vii. of *U.S. Geographical Survey West of the* 100*th Meridian*.

[4] *Bulletin of the Essex Institute*, vol. xv. p. 140.

Scrapers and Knives.

Of scrapers there are only four specimens in the Collection. One of these (fig. 4), however, is interesting as being identical in form with the semicircular spear-heads of obsidian found in Easter Island,[1] one of which, in the National Museum, is here shown half size for comparison (fig. 5). This specimen is formed from a large flake of quartzite, and is roughly worked round the scraping edge on one face. It measures $2\frac{1}{4}$ inches in length by $2\frac{7}{16}$ in greatest breadth. Of the other three

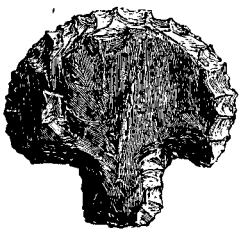

Fig. 4. Semicircular Scraper ($\frac{1}{2}$ inch scale).

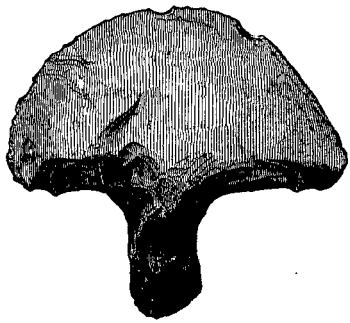

Fig. 5. Semicircular spear-head, Easter Island ($\frac{1}{2}$ inch scale).

scrapers, which are of chert, two are of oblong form, with rounded angles, similar to many found in Great Britain and Ireland. The third specimen, which is of a type peculiar to America, is furnished with a projecting ear on each side at the scraping end. American archæologists consider this type to be made of the lower portions of broken arrow and spear-heads. Specimens are figured by Abbott,[2] Wilson,[3] and Rau.[4]

[1] These spear-heads appear to be of a class with the chisel-ended arrow-heads described by Dr John Evans in his *Ancient Stone Implements*, p. 352. In the *Proc. Soc. Ant. Scot.*, vol. viii. p. 320, Lieut. C. M. Dundas, who visited Easter Island, states that the spears with these heads "were only used for wounding, as a rule, and the enemy was despatched with a club."

[2] *Primitive Industry*, pp. 129–134.

[3] *Prehistoric Man*, vol. i. p. 86.

[4] *Cat. Arch. Coll.*, p. 13.

Of knives there is only one specimen (shown, half size, in fig. 6) in the collection which can with certainty be so called; but, as already mentioned, many of the implements described as arrow and spear-heads may also have been intended for, or even used as, knives. The specimen here referred to is formed from a crescent-shaped flake of greyish chert, $3\frac{3}{8}$ inches in length. The secondary working is confined to the inner or cutting edge, on the upper face, while the under side is unworked, and shows the natural surface of the fracture.

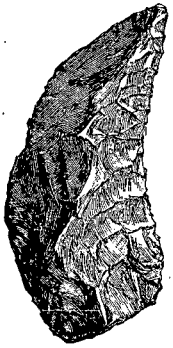

Fig. 6. Knife ($\frac{1}{2}$ inch scale).

Miscellaneous.

Axe of greenish claystone, $4\frac{1}{2}$ inches in length by $2\frac{1}{4}$ inches across the widest part at the cutting edge, and $1\frac{3}{8}$ inch in greatest thickness; polished at the cutting edge on each face, with rounded sides and tapering butt.

Axe of hard gneissic stone, $5\frac{1}{4}$ inches in length by $2\frac{3}{8}$ inches across the widest part at the cutting edge, with flattish sides and thick rounded butt. Polished on both faces.

Axe of greenstone, $8\frac{1}{4}$ inches in length by 3 inches in breadth, with rounded sides and thick butt, polished on each face at the cutting end, and having the remaining parts roughly pecked.

Implement of kaolin, $4\frac{3}{4}$ inches in length by $2\frac{5}{16}$ inches in greatest breadth at one end, and tapering to one inch at the other, and one inch in greatest thickness. The implement is roughly chipped into shape, and has the broad end much fractured as if by use.

Implement of white chert, $3\frac{1}{4}$ inches in length by $1\frac{9}{16}$ inch in greatest breadth and $\frac{7}{8}$ inch in thickness, roughly chipped into shape, but showing finer secondary working at the narrow end on one face, and at the broad end on both faces.

Implement of hornstone, of oval, double-pointed form, $4\frac{3}{4}$ inches in length by $2\frac{1}{4}$ inches in breadth, and $1\frac{1}{8}$ inch in greatest thickness, and having the sides worked to a sharp cutting edge all round.

Implement of hornstone, of irregular oval shape, and pointed at one end, $3\frac{3}{4}$ inches in length by $2\frac{1}{4}$ inches in breadth, and $1\frac{1}{8}$ inch in greatest

thickness. The round unpointed end or base shows the natural surface of the nodule from which the implement has been made.

The two implements of hornstone just described closely resemble well-known palæolithic types in flint found in considerable numbers in the river gravels of England and France. English specimens resembling those from Alabama have been figured.[1]

Implement of quartzite sandstone, of oblong shape, with rounded angles, $3\frac{7}{8}$ inches in length by $2\frac{7}{8}$ inches in breadth and $1\frac{3}{8}$ inch in thickness, ground flat on both faces, and having a shallow circular depression in the centre of each. The two ends of the implement are much worn, as if by use as a hammer-stone. An implement of exactly the same form, $3\frac{1}{4}$ by $2\frac{1}{2}$ by $1\frac{1}{4}$ inches, found at Falkland, Fifeshire, was recently added to the National Collection.

An oval-shaped water-worn pebble of quartzite, one face of which has been roughly smoothed by "pecking." Another of the same form and material has a small circular depression, $1\frac{3}{8}$ inch in diameter and $\frac{1}{4}$ inch in depth, in the centre of the flat face.

Three water-worn pebbles of quartzite, abraded by use as hammer-stones, one with a smoothed polished surface on one side.

Pestle of quartzite sandstone in the form of a cone, $3\frac{3}{4}$ inches in height by $2\frac{3}{4}$ inches in widest diameter across the grinding-face, which is irregularly circular in outline, and has a slight depression in the centre. A pestle of exactly the same form and size has also been recently added to the National Collection. It was found during the construction of the Minas and Rio Railroad, in the province of Minas Geras, Brazil,

[1] Evans, *Ancient Stone Implements*, figs. 421, 422 (Icklingham), and 452 (Hackney Down). Numerous roughly chipped implements of argillite and quartzite have been discovered in the United States under circumstances similar to those under which the palæolithic implements of Europe have been found. The following references may be useful to those who wish to pursue the subject further:—Wilson, *Prehistoric Man*, vol. i. pp. 58, 59; Nadaillac, *Prehistoric America*, pp. 20–23, specimens from Mexico; *Congrès International des Américanistes, Copenhague*, pp. 283–286; *Reports Peabody Museum*, vol. ii. pp. 30–47; *Proceedings Boston Society of Natural History*, vol. xxiii. pp. 421–449, "Palæolithic Man in Eastern and Central North America;" Abbott, *Primitive Industry*, pp. 471–551; *Smithsonian Annual Report*, 1875, pp. 246–253, "Stone Age in New Jersey;" *American Anthropologist*, vol. ii. pp. 225–268, and *ibid.*, vol. iii. pp. 1–26; *Proc. U.S. National Museum*, vol. xii. pp. 367–376.

along with two others, at a depth of 18 inches below the surface, "which was covered with grass, and had no appearance of having been ever disturbed."[1]

Another very fine pestle, from Vancouver's Island, is also in the National Collection.

There are also a few broken implements, which it is needless to describe in detail.

*** Since this paper was written a few additional specimens have been added to the Collection by Mr Brodie, but are not included here.