

I.

REMARKS ON A BRONZE IMPLEMENT, AND BONES OF THE OX AND DOG, FOUND IN A BED OF UNDISTURBED GRAVEL AT KINLEITH, NEAR CURRIE, MID-LOTHIAN. BY JOHN ALEX. SMITH, M.D., Sec. S.A. Scot.

Locality.—A little to the east of the village of Currie, and rather more than five miles to the west of Edinburgh, the Water of Leith receives on its right bank the streamlet of the Kinleith Burn, which flows in a rapid though short course from the Pentland Hills immediately to the south. Below the junction of the Kinleith Burn, the narrow valley of the Water of Leith gradually becomes wider, and opens into an oval-shaped haugh of tolerably level land, measuring altogether some 8 or

10 acres; and, at the lower extremity of this valley, where the banks on each side again approach the stream, the bed of the river, as the Ordnance Survey Map informs us, is 400 feet above the level of the sea.

The Water of Leith runs along the northern border of the haugh just referred to; and on the level part of the ground are situated the paper mills of Kinleith, about midway between the stream and the sloping bank, which bounds the valley on the south. The engine chimney rises at the south side of the works, and from its prominent position in the gorge of the little valley, it has on two different occasions been struck and partially injured by lightning; in consequence of which the proprietor, Mr Henry Bruce, determined last summer to build a new chimney, a little to the south and east of the old one. For this purpose, a circular space of ground, about 23 feet in diameter, was marked out on the green turf of the level haugh, at a distance of 293 feet from the present bed of the stream; and the process of excavation commenced. The superficial vegetable mould was first cut through and removed, when finely laminated beds of sand and clay were exposed; in some places the former, in others the latter being most abundant. [Specimens of the pure sand, and clay, were exhibited.]

Section of Beds.—These beds of sand and clay measured from 5 feet to 5 feet 8 inches in thickness or depth, and contained comparatively few small pebbles; indeed, on searching the cut sides of the excavation, scarcely one could be detected. Below the sand, however, a bed of rough gravel was reached, consisting of stones of various sizes, from the large boulders of more than a yard across, evidently derived from the neighbouring boulder-clay, to the smaller-sized pebbles of ordinary gravel, little or no sand being intermixed. This bed of gravel measured about 5 feet in thickness, and was found to overlie the solid rock, a stratum of hard limestone being exposed below; the stratum was broken and uneven on its surface, and dipped slightly towards the south, thus causing the bed of gravel to vary in thickness, in different parts, to the extent of nearly a foot. The whole gravel was then gradually cleared away, to allow the foundations of the chimney to be placed on the solid rock. It was when some large stones were being removed from the west side of this gravel bed, about 6 inches or so from the bottom, and nearly 11 feet from the surface of the ground, that the bronze implement (now ex-

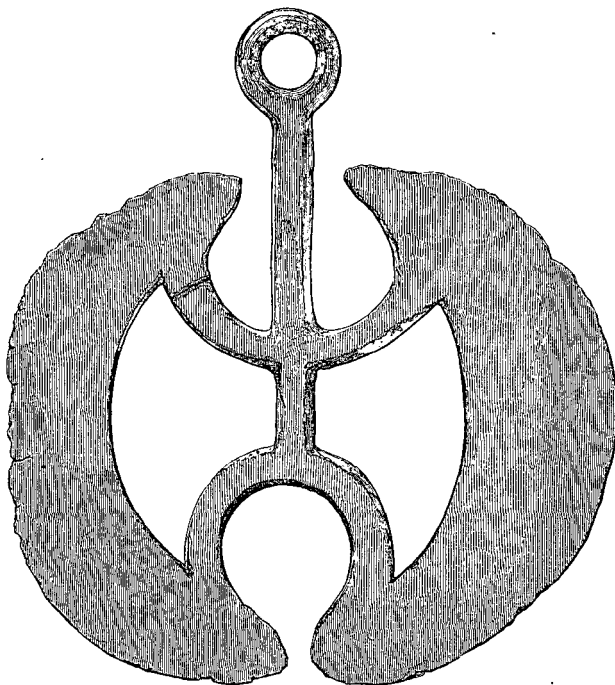
hibited) was discovered, on Friday, the 27th of June last. Mr Bruce kindly informed me of its discovery, and I visited the place shortly after, and had pointed out to me the exact spot where it was found. It was lying in the closely-packed gravel, behind several large stones, which lay to the west of it—up the course of the old current or stream.

Bones of Ox and Dog found.—A few broken pieces of bone were also found; and Mr Bruce, at my request, had a strict watch kept, to see if anything else could be discovered, especially any teeth, which, from their hardness and density, are occasionally found well preserved in gravel; only a few more bones, however, were found as the excavation went on, lying in different parts of the gravel-bed, and especially towards the east side of the pit; these were principally fragments, broken probably from their friction in the gravel; and they split and crumbled so much when touched, from their age and absence of their gelatinous constituents, that it was necessary to steep them in glue before they could be handled. These pieces consist of various bones of the ox, part of the left hip-joint or acetabulum, with a portion of the pubic bone attached; lower portions of the tibia or leg-bone, and cannon or metatarsal bone of the same side; and the condyles or lower part of the femur or thigh-bone of the right side. All these bones belonged to an ox of moderate or rather small size. Another bone was, however, picked up, a radius from the right fore-leg of a moderate-sized dog. (The bones were exhibited.)

Bronze Implement found.—The bronze implement found is a very curious one. (See fig. 1, where it is drawn of the full size.) We have nothing like it in our Museum; and I have not been able to find a notice of any similar weapon having been discovered in Britain. It has been formed probably from a plate of bronze, cast in a mould, and afterwards finished with a tool, the edges being thin and sharp, and the thicker central part terminating in a circular loop or ring, which forms a handle, and this handle is further defined by openings left in the central part of the plate, the result being the regular figure which the whole forms, with its two pairs of bent branches passing outwards on each side from the central bar or handle, and each pair supporting a crescentic or semicircular blade, which becomes gradually thinner towards its outer and rounded margin. In cutting out or finishing these spaces from the centre of the plate, the tool seems to have been used in one direction

only, without moving the metal plate, the apertures being all cut from the same side, and the cut surfaces bevelled in the same direction. The metal of which it is composed seems to be very pure and fine. One of

Fig 1.



Bronze Implement found at Kinleith, Mid-Lothian. (Scale, size of original.)

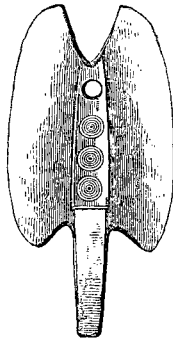
the blades, however, has become considerably corroded, the green carbonate of copper having formed over a great part of its surface.

The implement measures $3\frac{3}{4}$ inches in length, the handle being $2\frac{1}{2}$ inches long; each of the blades is $2\frac{1}{4}$ inches in length, by $\frac{3}{4}$ ths of an

inch across the middle; and the whole measures $3\frac{1}{2}$ inches across, from face to face of the rounded blades. The handle is $\frac{1}{8}$ th of an inch in thickness; and the metal is gradually thinned down from the centre, to a fine edge, on each side.

The shape and character of the instrument shows it to have been evidently intended for some cutting purpose, and reminded me at first of a saddler's or shoemaker's knife for cutting leather. The extreme delicacy and thinness of blade, however, would make it quite unfit for any such rough purpose.

Fig. 2.



Bronze Razor (as supposed), from Museum of Royal Irish Academy, Dublin.
(Scale, one-half of size.)

Irish Bronze Instrument.—In the Catalogue of the metallic materials in the Museum of the Royal Irish Academy, under the title of TOILET ARTICLES, a figure is given of the largest of three bronze implements, which appear to me to belong to at least the same Class of instruments as this one, though certainly not to exactly the same species or pattern. (See the annexed woodcut, fig. 2, where this Irish bronze is drawn to a scale of one-half its natural size.) The Irish specimen is described in the Catalogue referred to (p. 549) as follows:—“It is all of one piece, $3\frac{1}{2}$ inches long, $1\frac{1}{4}$ wide; has a stout, flat stem, decorated on the surface, with an aperture near the top; and has exceedingly hard, sharp side-

edges. The two other specimens are smaller. There is a large specimen in Trinity College Museum." "It is conjectured they were used as razors."

Supposed Use of the Bronze Implement found at Kinleith.—The appearance of the whole of these bronzes, like that of the one now exhibited, is manifestly suggestive of some kind of delicate cutting or scraping process, not improbably the rather important one of shaving! The circular ring at the extremity of the handle of the one found at Kinleith

Fig. 3.



Bronze Implement from Kinleith, showing how it may have been held for use.
(Scale, one-half of size.)

may have been simply for its preservation by suspension, as a valuable and useful instrument, and perhaps ornament; and the Irish ancient "razor" has also a circular opening, pierced, however, at its upper extremity, probably for a similar purpose. It seemed at first rather difficult to account for the peculiar and regular openings cut in the plate of bronze, by which this Kinleith specimen differed in character from the

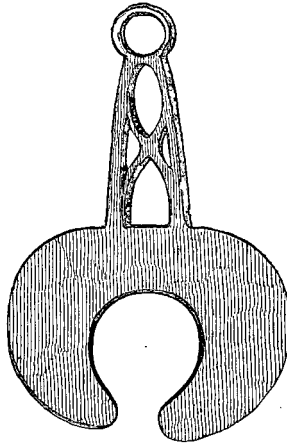
Irish one. I found, however, that by passing my first finger into the rounded opening left between the blades, which indeed it seemed quite to fit, and my thumb and third finger into the side openings (see sketch, fig. 3, where this instrument is figured to the same scale as the other bronzes, figs. 2 and 4), I could get a complete command of the instrument, for applying its sharp edges to the face, in the supposed act of shaving. It had in this way a steadiness and efficiency not only not possessed by the Irish specimens, but scarcely equalled by our own modern razors. I think it not impossible, therefore, this may have been the way in which it was used; and if the solid and straight double-bladed bronze implements of the Irish Museum were razors; this may probably have been one, and apparently even an improvement on them.

Swiss Bronze Implement.—In the valuable work of M. Frederic Troyon, on the “Lacustrine Habitations of Ancient and Modern Times,” figures are given of various bronze relics found in Switzerland; and in plate x. fig. 8, there is a drawing of an implement of bronze, which corresponds in character to the one found near Currie, the pattern being but slightly different; inasmuch as a straight and perforated handle, terminating also in an open ring, projects from the rounded side of a single crescent-shaped blade of bronze; the points of the crescent, however, approach one another so closely, that its general resemblance to that found at Kinleith, is quite apparent (see fig. 4, copied from M. Troyon’s work, pl. x. fig. 8; and, like the others, drawn to half its original size). Its size also closely corresponds to the others; the *blades* on each side measuring $2\frac{1}{4}$ inches, nearly about the same length as the blades of the other bronzes described, and the projecting handle $2\frac{1}{4}$ inches; its whole length being about $4\frac{1}{2}$ inches, by about 3 inches in breadth measured transversely across the crescentic blades. The Kinleith bronze being $3\frac{1}{4}$ inches in length by $2\frac{1}{2}$ inches across; and each *blade* measuring $2\frac{7}{8}$ inches in length; while the Irish bronze measures $3\frac{1}{2}$ inches long, by $1\frac{3}{4}$ inches across its solid double-edged blade.

I examined M. Troyon’s very valuable work, with a special interest, to learn what was his opinion of the supposed use of this blade, or crescent of bronze as he terms it, and found that he gives a very different explanation to the one here suggested, and having nothing whatever to do with the affairs of the toilet! It was discovered, M. Troyon informs us, at

Steinberg, near Nidau, which, he says, is one of the most important piled sites on the Lake of Biene. He describes it as belonging to the age of bronze; and refers it to a class of other crescent-shaped articles of pottery also found there, and considered by him as of particular interest, because that to them, he fancies, some mysterious or supernatural character had been attached.

Fig. 4.



Bronze Implement, found in the remains of a Lacustrine Habitation at Steinberg, near Nidau, Switzerland. (Scale, one-half of size.)

Swiss Crescents of Pottery and Bronze.—Colonel Schwab, M. Troyon informs us, discovered at Steinberg more than a score of these crescents, formed of a coarse white pottery, ornamented with various lines, and having broken particles of quartz kneaded into the clay of which they were formed. They vary in size, measuring from 8 to 12 (French) inches, from point to point of the horns of the crescent; and at the horns they are from 6 to 8 inches in height. (I exhibit sketches of these articles, copied from M. Troyon's work, which will show their character better than any description.)¹ The lake town of Steinberg, M. Troyon believes, was occupied

¹ M. Troyon's *Habit. Lacust.*, pl. xvi. p. 184. Lausanne (1860).

from a very ancient period; he considers, however, that this symbol of the crescent had not been in use in the very earliest times, or it would have been found in other places along with the most ancient class of remains, which appears not to be the case, as far at least as present discoveries have shown. In 1851, however, at Ebersberg, not far from Berg, in the Canton of Zurich, several fragments of similar crescents, formed of stone, were found along with very ancient remains, M. Troyon, therefore, concludes that the use of the crescent also belonged to the age of bronze. M. Troyon quotes from the Report of our Honorary Member, Dr Ferdinand Keller, in 1858, various explanations of the use or meaning of this religious symbol as he terms it, of the crescent. He supposes these crescent-shaped bodies had no practical use, but were placed either as ornaments on or in their houses, or were used as objects of worship. He refers to the worship of the moon by the Germans, and the use of the crescent and the moon in the worship of the Druids, the moon being considered by them as "that which heals all things." These mysterious healing virtues, which the Gauls also attributed to the moon as the "all healer," sufficiently explain, he thinks, the signification of the images of the crescent discovered at the lake towns of Steinberg and Ebersberg, and he accordingly comes to the conclusion, that these various crescent-shaped bodies had been panaceas, or important healing amulets. Dr Keller also mentions, that Colonel Schwab has in his collection an article of bronze, in the form of a crescent, furnished on its convex side with a projecting handle, being the implement to which I have already referred, and figured; it is described as being very thin or slender, and incapable of resisting much pressure. Dr Keller says, it would be difficult to say whether it has served for a cutting instrument; but it may, like the figures in pottery, &c., of the crescent, have been employed as a sort of amulet, or as an instrument of healing.¹

After the references by these learned authorities to the mysterious symbol of the crescent, it may seem rather presumptuous in me, who have only seen the drawings, and read the descriptions of these peculiar crescent-shaped pieces of pottery and stone, to suggest at least the possibility of their having had a more practical use. From the great resemblance in the character of the coarse pottery of which they are formed,

¹ M. Troyon's *Habit. Lacust.*, p. 188.

with its *imbedded fragments of quartz*, to the same arrangement—of broken pieces of quartz imbedded in the clay of which the Roman mortaria were formed—manifestly to increase their grinding power; as shown, indeed, in some of the portions of Roman mortars, presented by me to the Museum, which were found at Newstead, Roxburghshire. I am much inclined to assume, that these crescent-shaped bodies, may have been simply rubbers, pestles, or grinding instruments, to be used by one or both hands according to their size, with or without a mortarium, for crushing or rubbing down the various grains, or harder articles of human food, which, from the remains found in these lake dwellings, are known to have been in use at the period of their occupation by man. The short projecting horns of the crescents, would assist in giving a more fixed, or firmer hold to the hands, while using them in the act of trituration or grinding.¹

However this may have been, there seems to me at least, little doubt, that the bronze crescent, from its great resemblance in character to the implement found at Kinleith, and also those found in Ireland, might have had a practical use, and may be simply a variety in the pattern of this ancient form of bronze knife or razor. The hollow between the horns of this Swiss crescent, where the metal appears to be thicker, and not thinned down to a fine edge, as it is on its *outer* margins, might, by the finger being occasionally hooked over it, also assist in steadying the blade, held by its projecting handle between the other fingers; and in this way it would somewhat correspond to the one found near Currie.

Before concluding, I shall make a few remarks on the supposed *Age of this instrument of bronze*.—Shortly after its discovery, various antiquarian and geological friends, Mr John Stuart, Dr M'Bain, Mr Alexander Bryson, Mr William Turner, and others, went with me, at different times, and made careful examinations of the excavation, as the

¹ In a letter with which I have since been favoured by Mr Albert Way, he states, that from his own examination of the Swiss crescents of clay and stone, he does not consider them adapted for any purpose of trituration, as suggested by me, and he agrees with Dr Keller in the conjecture of their having borne some relation to the religion, or worship, in these old lake homesteads; Mr Way does not believe, however, in there being any connection between them and the crescent-shaped implement of bronze.

process of digging went on, and especial attention was paid to the beds cut through above the gravel; there was not the slightest appearance of any pit or digging of any kind having ever been previously made, the beds of sand being quite undisturbed since their first deposition. My friends all agreed with me in thinking there was also no indication of any of the depth of these beds of sand being due to a landslip from the distant sloping banks at the sides of the valley, or any sudden occurrence of that kind. The upper beds being uniform in character, and comparatively free from stones, and so different from the rough gravel below; they were suggestive simply of a gradual deposit of silt from a nearly still pool or lake.

The geologic history of the site being, apparently, that the bed of rough, clean, and large gravel at the bottom, proved the previous existence of the stream of a rapid river, over which man may have steered his rude canoe, and dropt his bronze knife in the stream; or if you connect together the whole relics found in the same portion of the bed, that of man who had dwelt on the river banks at that early time, when the stream ran over this ancient channel, with cattle, and his dog, in pursuit of which he may have waded in the rough bed of the river. You have next a sudden stop put to the rapid current of the river, at the lower extremity of this valley, probably by an extensive landslip, following long-continued rains, or winter's frost and snow, which might easily have occurred, there, from the right bank on the south, a little farther down the stream, where the steep bank still exposes its broken strata of shales and limestones, all sloping down towards the river bed. The result of this supposed landslip would be the formation in the Kinleith valley of a large still pool or lake, from which the gradual deposit of silt and sand would take place, as it has done to a depth of nearly five feet. The river, however, would at last cut through the barriers by which it had been for some considerable time pent up; but its course has now been somewhat changed; for, instead of spreading over the valley, or running, as it may have done, towards its southern side, the river now finds its way along the northern margin, partly directed, it may have been, by the freshets of the Kinleith burn bringing down abundance of *debris* from its deeply-cut bed, which, becoming arranged principally along the right or south bank of the Water of Leith, especially at the upper end of the valley,

would assist in forming the present haugh, and turning the stream towards the northern side of the valley, to occupy its present bed.

Mr Bruce, at my desire, compared the level of the strata exposed at the bottom of this excavation, with that of the same strata in the bed of the stream immediately to the north of his works; in both places the strata were irregularly broken up in a similar manner, and there seemed not much difference between them, the old bed in the excavation being perhaps about a foot or so above the present bed of the river. Over the old river-course, with its accumulation of gravel, a bed of sand had next been formed, to a depth altogether, of 11 or 12 feet, and the river had apparently never again returned to its older bed, the *debris* over which now forms a continuous bank, sloping down to its present channel, at a distance of 293 feet from this excavation. The absence of any upper or secondary beds of gravel among the sand and silt of the excavation, shows that the river had never returned to this spot, as these would necessarily have been formed here, had it ever again, in full stream, flowed over its ancient bed.

This district of country, we know, was the abode of man at a very early period; for, passing by our historical records of its ancient occupation as comparatively recent, the short stone cists or graves of its early inhabitants have been discovered in the immediate vicinity; and in our Museum we have the well-formed skull and ornamented clay urn or drinking-cup taken from a grave of this early character at Juniper Green, on the opposite side of the river. Mr Bruce also informed me that various short cists of a similar character, the stone slabs of which I saw, were exposed when his water-supply ponds were being made, on the slope of the south bank towards the upper extremity of this little valley, immediately above and overlooking this old river bed; and it is to this rather indefinite, but undoubtedly early period, or to one not much later, I am inclined to consider this implement or razor of bronze to have belonged. Similar interments in these short cists have been discovered over an extended range of our country, from the northern counties of Scotland, even towards the south of England, showing, apparently, in this respect, a close resemblance in the customs of these early inhabitants. And from historic record we learn, that at least about half a century before the Christian era, the fashion of partial shaving of the person prevailed in Britain, as

Cæsar, in the fourth chapter of his second book "De Bello Gallico," informs us—"the Britons shaved the whole body, with the exception of the head and the upper lip," so that razors of some kind must have been generally used, at that early period.

It is interesting to notice the analogy in character with the bronze implement found in Switzerland, of this one, found among the undisturbed gravel, with its overlying beds of silt, in the valley of a Scottish river, some 400 feet above the level of the sea, implying, no doubt, changes in the district which, as well as the type of the weapon itself, all speak of a great antiquity. We can at present glean but little information as to the exact period of the early occupation of the piled lake dwellings of Switzerland; there seems no reason, however, to assume anything like what may be called geologic periods of time, as necessary to account for the antiquity of their remains. Antiquaries, arranging the various relics found, speak of them as belonging to the so-called ages of stone, of bronze, or of iron; but we know comparatively little importance can be assigned to any such artificial and merely assumed periods of unmeasured time, and we find in our own country various kinds of exactly similar remains, in such frequently occurring relations to one another, as leaves little doubt of many of them having been contemporaneous in their use; metallic substances being of course rarer and more valuable in those early days, as well as more perishable, and necessitating in most localities at the same time, the frequent use of the more common articles of stone and bone. The piled sites in this country appear, however, to have been in use down even to a comparatively very recent period, and our Vice-President, Mr Joseph Robertson, considers, as the result of his inquiries, that some of them had been occupied even in mediæval times.

We are told that habitations of a similar character still exist in some parts of the world, as among the Papoos of New Guinea; and historical record tells us of their existence at least as far back as the fifth century before Christ. Herodotus, in chap. 16 and lib. v. of his *Life*,¹ states that when at the port of Eion on the river Strymon, in Thrace (b.c. 459), he paid a visit to a people who lived in houses built on piled platforms

¹ *Life and Travels of Herodotus* by J. T. Wheeler, vol. i. p. 359, 1855; and Rawlinson's *Herodotus*, vol. iii. p. 227, 1859.

in the lake of Praseas—the Strymonic Lake—according to Colonel Leake the *Takhimos* of the present day. This site has, it seems, been lately rediscovered by M. Delville,¹ and antiquaries, I am sure, will wait with much interest for a careful examination of these ancient lake dwellings with their buried remains, for comparison with those of the Swiss lakes; we would then be better able to judge whether, or how much, it might be necessary to add to an antiquity like this, of nearly 500 years before Christ, when attempting to calculate the age of the corresponding remains that have been found in Western Europe.

Chemical Analysis of the Bronze Implement found at Kinleith.—Being anxious to add another analysis of an ancient bronze to those already given in our Proceedings,² I placed the bronze implement, found at Kinleith, in the hands of our well-known practical chemist and lecturer on chemistry, Dr Stevenson Macadam, asking him, at the same time, if he could give me any information of the cause of the different appearance and colour of the ærugo or patina which was shown on bronzes of different ages; whether the particular appearance of the patina might give any information as to differences in their composition, and perhaps, therefore, of their antiquity. I also wished information as to the hardness of the metal of which this instrument was composed, and its capability of having once had a fine and sharp edge.

Dr Macadam filed a portion of the metal from the back of the straight stalk or handle, where it has since unfortunately been broken; and has kindly favoured me with the following notes, giving the result of his examination:—

“I have examined the bronze implement found at Kinleith, near Currie, and find its composition to be:—

Copper (with trace of lead),	92·97
Tin,	7·03
	100·00

It is therefore a true bronze, with less than the average proportion of tin.

“The metal was *hard* under the file, and it might have had an edge when new. I have no doubt the rust is a double carbonate and oxide of

¹ Nat. Hist. Review, vol. ii. p. 486, 1862.

² Proc. Ant. Scot., vol. iv. p. 600.

copper, but I do not know if we can connect the characteristic appearance of this rust with any peculiarity in the composition of the alloy. I would be more inclined to consider that the circumstances in which the implement was placed in regard to moisture and atmospheric action, would play an important part in the formation of the various coloured tints."