I.

NOTICE OF A LARGE COPPER-LIKE OR BRASS ANVIL, STATED TO HAVE BEEN FOUND IN THE SOUTH OF SCOTLAND: ALSO OF A SMALL ANCIENT BRONZE ANVIL, FOUND IN SUTHERLAND.

By JOHN ALEXANDER SMITH, M.D., Sec. S.A. Scot.

Bronze anvils are of great rarity, comparatively few of them having been discovered anywhere, and these have been generally of a small size. In the "Catalogue of the Antiquities in the Museum of the Royal Irish Academy," Dublin, a very small bronze anvil is figured of the actual size (apparently between 2 and 3 inches in height, p. 523). It is not stated where it was found, and you are left to infer that it was found in Ireland. Mr. John Evans, in his important work, *The Ancient Bronze Implements and Ornaments of Great Britain and Ireland* (London, 1881, 8vo), gives details of various bronze anvils. He refers to this one in the Museum of the Royal Irish Academy, which, however, he thinks of more recent date than the Bronze period, as the only one yet found in the British Isles. Mr. Evans notices several small anvils found in different parts of the continent of Europe, and figures one in his own collection, found at Fresné la Mère, near Falaise, Calvados, France (pp. 182–3). He believes also that various bronze implements, which have been considered to be socketed hammers, may have been fixed on straight stakes, and served as anvils, and states that, though not now apparently used in this country, traces of their former employment remain, in the fact, that a small anvil to cut and punch upon, and on which to hammer cold work, is still termed a "stake" (p. 181). Mr. Evans also refers to those found in the Swiss lake dwellings, described and figured in Dr. Keller's well-known work. These anvils are all of small size, and are

considered to be of ancient bronze, containing a large percentage of tin, and have been found associated with other true bronzes. From their small size, and weight of a few ounces, they seem to suggest that they had been used by jewellers or workers in the more precious metals, and that the class of larger anvils which would be required for the workers in bronze, on which to fashion the more ordinary kinds of the larger bronze weapons and implements, &c., whether of bronze or, it may have been probably, of stone, have not as yet apparently been discovered. Bronze anvils of the form now in use, Mr. Evans says, are of extremely rare occurrence in any country.

Large Brass Anvil.—The copper-like anvil I have now the pleasure of exhibiting to the Society is very much larger in size, and greater in weight, than any of those already referred to (see woodcut). It measures along the top, to the point of its projecting horn, 10 inches, by $5\frac{1}{2}$ inches in greatest breadth across the top, and from the flat top to its pointed lower extremity is 11 inches in height, and weighs 40 lbs. avoirdupois. The anvil has a red copper-like appearance, and looks as if it were made nearly altogether of pure copper. I am not aware of anvils of copper being now used by any special workers in metal. It would seem to have been cast in a very rude mould of some kind, the whole under surface being rough and uneven, and the projecting lines left by the joining, apparently, of the halves of the mould, being very distinct, especially on the lower parts of its base. It shows considerable marks of use on its smooth upper surface. Its shape is much like that of the anvils now in use; it has, however, a small round hole pierced through at the junction of the horn with the flat top of the anvil, and not, as is generally the case now, a square hole on the opposite side from the projecting beak. Its flat upper surface, projecting beak or horn, and also its great weight taken together are characters probably not suggestive of any very great antiquity.

Mr. Alexander Curle, F.S.A. Scot., Melrose, called my attention to this anvil, he having heard of it as a great curiosity from Mr. Jardine, plumber and brassfounder, Melrose. The anvil belonged to

Messrs. Peter Ramage & Son, brassfounders, Edinburgh, and was then in the possession of his widow and her son. They informed me that the late Mr. Peter Ramage had purchased it some forty years ago at the death, and breaking up of the warehouse, of Mr. Henderson, long a dealer in old metal in the West Port of Edinburgh. The story told about it was, that it had been purchased by Mr. Henderson from a

Brass Anvil believed to have been found in Scotland (⅛ of size).

gipsy, who stated he had found it in some bog or waste place in the country in the south of Scotland, probably not very far from Edinburgh. From the rude character and great weight of the anvil there seemed little likelihood of its having been brought from any very great distance, in those days of little facility of transit from one part of the

country to another, to be sold simply as old metal, and therefore it may be assumed there was probably some truth in the story. The anvil has now been deposited in our Museum by Mrs. Ramage and her son Mr. David Ramage. They state that it was much valued by the late Mr. Peter Ramage, and was believed by him to be of great antiquity; neither he nor any of his brethren in the trade having ever seen or heard of any other anvil of the kind. Its excessive hardness also, probably prevented it from being broken up and melted; so that it was allowed to remain all those years untouched.

To determine its true character Mr. W. Ivison Macadam, at my request, made a careful chemical examination of it, and the following is his interesting account of its composition:—

"ANALYTICAL LABORATORIES, SURGEONS' HALL,
"EDINBURGH, 12th *December* 1881.

"Analysis of BRONZE or BRASS ANVIL received from Dr. John Alexander Smith, Edinburgh.

Copper, ...	93·886
Iron, ...	0·973
Zinc, ...	1·121
Silica, ...	4·020
	100·000
Weight of the Mass, ...	40 lbs. avoirdupois.

"W. IVISON MACADAM, F.C.S., F.I.C.
Lecturer on Chemistry, Edinburgh."

"The zinc is very small in quantity, and can be accounted for by supposing that the brass intended for the casting was overheated, and the zinc volatilized as oxide. The heat, if long continued, would lead to a result very similar to the above figures. The silica is simply a portion of the sand in which the block was cast. The iron is probably due to the use of the anvil for fashioning articles made of that metal, and the consequent beating in of small particles of iron. The extreme roughness of the casting shows crude or unskilful workmanship, and, from the small proportion of zinc, it is very probable that the metal had been previously manufactured before being recast into its present form. The hardness of the metal is possibly due to long-continued hammering. W. I. M."

It is not therefore an ancient bronze containing tin, but from the presence of zinc even in so small a quantity, must be considered as brass, and therefore to belong to a much later or perhaps a recent period.

The amount of zinc present in this alloy seems very small indeed, smaller than in most of the published analyses of the zinc-bronze, or brass, of the early Iron age. Mr. Ivison Macadam's explanation of the presence of zinc in combination with the copper is at once ingenious and suggestive, shall I say, of a worker in metal who had apparently more facility in getting copper or brass than the usually more common iron; so that when he wanted a large anvil he apparently used up his accumulated old brass to cast a large and heavy anvil, rather than get an iron one fit for his purpose, and, from its size and weight, it must have been used in the manufacture of metal-work of considerable size. Still it is not very easy to understand how a metal like copper, generally of much greater value than iron, should have been used simply to supply a large heavy anvil, in no other degree better, as far as I am aware, for any ordinary use, than one made of the generally cheaper and much more common metal of iron. I learn, however, that the manufacture of a large iron anvil by an ordinary blacksmith, at least in outlying districts of the country, used to be formerly rather a formidable affair; the malleable iron, of which alone an anvil could be made, had to be rolled up, and the mass welded together and hammered into shape, by several forgemen with sledge-hammers working together, with considerable labour and difficulty. The steam hammers of more modern days manufacturing all such heavy articles, have now, however, made an end of all these difficulties, even in the remotest districts of the country.

I wrote Mr. John Evans, asking for any information on the subject, and he kindly writes me that he does not know of any instance of large anvils either of bronze or brass, but thinks they may have been in use by coppersmiths and brassfounders. I therefore wait for more information, especially as to the kind of anvils used by different workers in metals, as well among the gipsies as others, both at home and abroad.

Old Celtic Anvils.—In a former paper on the Massive Bronze Armlets of "late Celtic" character found in Scotland, I quoted from a published lecture by Cosmo Innes on "Scotch Surnames," his reference to the skill of the old Celtic workers in metal, and may here notice the fact, that on one of the characteristic Celtic "Sculptured Stones," of a still later period however, found principally in the north-eastern districts of Scotland, are represented what were probably the iron tools of the old Celtic smith—the anvil, the hammer, and the tongs. Here, of course, taken in connection with the undoubted pictorial and Christian character of the sculptures, at least on some of the subjects on these stones, as pointed out especially by Dr. Joseph Anderson, these tools were probably intended to bear a reference to the Passion of the Saviour. They are, however, interesting, as showing probably their ordinary shape and character at that comparatively early period.

I may take the opportunity of saying here that the term "Late Celtic," used by Mr. A. Franks of the British Museum (to distinguish, I fancy, from this period and art, the still older or British true Bronze period), is rather a confusing term, as, in this instance, where I refer to a still later period and style of Celtic art. Perhaps the term of "Late Celtic" might be more correctly applied to this latter class of more recent sculpture and art, and that of "Early Celtic" to the so-called "Late Celtic" of Mr. Franks; "the Bronze Period" being confined to the still older time of the true ancient bronzes. Dr. Joseph Anderson, in his course of the "Rhind Lectures" delivered last autumn, which will be published before long, to avoid altogether these uncertain terms or periods of art, has divided these same antiquities into the "Celtic Art of the Early Christian Times," and the "Celtic Art of the Pagan Times," the latter corresponding to the "late Celtic Art" of Mr. Franks; a style of art distinct, as we have seen, from the Roman style, with which some of it may, however, have been contemporaneous in our islands.

The stone referred to above is a large and richly sculptured one, still standing at Dunfallandy, near Logierait, Perthshire. It is about 5 feet high by $2\frac{1}{2}$ feet in breadth, has a richly sculptured Celtic cross on one

side, covered with varieties of interlacing Celtic ornaments, and bordered with various emblematic figures of angels, animals, &c., along its sides. On the other side of the stone, enclosed by two large serpent-like creatures which form a border to the stone, we have two draped figures seated in chairs, one on each side of a small upright cross of Celtic form, and above them three of the still unexplained "symbols," as they have been called, the "spectacle ornament," the "crescent and double sceptre," and the "elephant." Below these there is a horseman riding, enveloped in a large cloak or mantle, and in front of him the "crescent and sceptre ornament" and also the "elephant" symbol are repeated; while below him you have, as I have already stated, the tools of the Celtic Smith—an upright hammer, a large square-like mass or anvil, which expands upwards from the flat-like bottom to a broader and also flat top—it however shows no beak or projection of any kind; on the other side of the anvil there is represented a pair of large interlacing tongs, laid horizontally. These tools, like all the other sculptures on the stone, are intended to be shown in relief, the figures being first cut in outline, and the general surface or field of the stone afterwards cut or sunk to a lower level. This, however, has only been partially finished at this part, as well as on other parts of the stone; but the sculptures are all evidently of one date. Dr. John Stuart, in his *Sculptured Stones*, probably from having only seen a drawing of the stone, considered these tools as simply incised on the stone, and probably of a much later date than the other sculptures. As we are now fortunate enough to have an excellent cast of the stone in our Museum, we are able to notice at once the correctness of the distinction I have now pointed out. Dr. Joseph Anderson, in the second series of his *Scotland in Early Christian Times* (the Rhind Lectures for 1880), states that the age of these sculptured stones may be considered to belong to "a period later than the commencement of the tenth century, and the incised monuments to the period immediately preceding"—the later period of the Celtic church in Scotland.

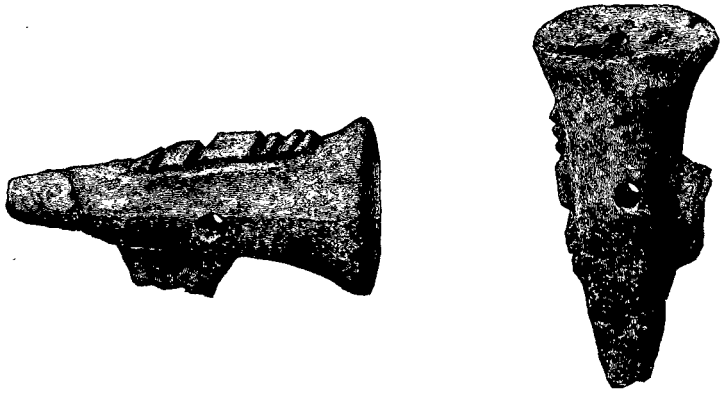
The only other Scottish example I remember, of an anvil sculptured on an early Christian tombstone, occurs in Iona, but is of still later date; where

you have represented a rather tapering square-like mass, with a small projection or horn above, displayed in a vacant space or panel in the foliage, below an interlacing cross; and in spaces left at each side of it, there is a large nail sculptured and inverted; both, doubtless, from their position, also refer to the Passion. This stone is figured in the fine collection of drawings of these later Celtic crosses in the *Sculptured Monuments of Iona and the West Highlands*, plate xxxi., by the late James Drummond, R.S.A., F.S.A. Scot., a volume recently issued to the Fellows by the Society. I know no other instance of the anvil or other tools of the important worker in metal being sculptured on any of these early stone monuments, and thought it might be worth referring to these instances here, when treating of ancient anvils.

Small Ancient Bronze Anvil found in Sutherland.—Quite recently the Rev. J. M. Joass, LL.D., Golspie, has sent for exhibition to our Society a small bronze anvil found in Sutherland. It is tapering or conical and rounded in shape, with a flat and rather expanded oval top; which shows considerable marks of wear from frequent use, and it terminates below in a blunt point. Four small rounded holes of different sizes on the flat top may have simply been defects in the casting. A second and smaller point or beak also projects outwards on one of its sides, but appears to have been broken across at a little distance from the body of the anvil. On the opposite side of the body to this beak there is a projecting band, which is cut across, towards the top of the anvil, by three small rather angular notches close together, then a wider groove curved or rounded in section at a little distance, and beyond this there is another narrow angular groove. The anvil could therefore be used with either of its extremities fixed in the workman's bench; the first when the flat top was used, and the second or lateral one when it was needed to draw or shape small rods of metal through these side grooves in the projecting band, or "swages," as they are styled by workers in metal. The body of the anvil is pierced by a round hole nearly opposite to the upper part of the broken side beak, or lateral extremity, and, like the rest of it,

shows signs of having been much used. The principal pointed extremity has also been broken across, but the point has fortunately been preserved.

This anvil measures $3\frac{3}{4}$ inches in length, the pointed or terminal extremity being slightly broken, and 2 inches along the oval-shaped top, by $1\frac{1}{2}$ in greatest breadth. The second or lateral extremity, projecting from the side, measures about an inch across at its base, and the raised belt or fillet on the opposite side, with its various crossing notches, measures altogether $1\frac{3}{4}$ inch in length; the grooves varying from a very narrow line to a quarter of an inch in breadth. The anvil weighs $10\frac{1}{2}$ oz. avoirdupois. From its small size, like the other bronze anvils already



Bronze Anvil found in Sutherland ($\frac{2}{3}$ of size).

referred to, it may be supposed to have belonged to a worker in the precious metals. In its general character it resembles the anvil found in France described and figured by Mr. John Evans, which measures apparently about $3\frac{1}{2}$ inches in greatest length, has the lateral and shorter beak much larger, and the top of the anvil is divided into two sloping portions; there are also "swages" on both of its sides.

This anvil is therefore a smaller and simpler tool. Its character is well shown in the annexed careful drawings.

The Rev. J. M. Joass, LL.D., of Golspie, writes me, that the locality where the anvil was discovered is rather indefinite. "It was found, I understand, about ten years ago in a cairn near the Kyle of Oykel, a little farther up than the place where the blade occurred which you have described and figured in the *Proceedings*, vol. viii. p. 476."

The blade here referred to, was a small thin leaf-shaped and ornamented blade found in a cinerary urn in a cairn of stones at Balblair, Sutherland.

Mr. Ivison Macadam has since favoured me with the following careful chemical analysis of this anvil, showing it to be a true ancient bronze with a large proportion of tin, probably to add to its hardness, and fit it better for the purposes of an anvil:—

"Analytical Laboratory, Surgeons' Hall,
"Edinburgh, 25*th May* 1882.

"Analysis of Bronze Anvil, received from Dr. John Alexander Smith, Society of Antiquaries.

Copper,	70·410
Tin,	26·424
Iron,	1·601
Sand,	1·321
Loss (oxygen, &c.),	0·244
	100·000

"The tin present is very large in amount, and has rendered the alloy brittle, and at the same time crystalline.

"W. Ivison Macadam, F.C.S., F.I.C.
Lecturer on Chemistry and Analytical Chemist."

The small bronze anvil in the Museum of the Royal Irish Academy was believed to have been found in Ireland.

[Another bronze described as an anvil by Mr. Franks, since this paper was read, was also found in Ireland. I learn from the *Athenæum*, No. 2838, London, March 18th, 1882, Mr. A. Franks of the British Museum has exhibited to the Society of Antiquaries of London a number of ancient bronze implements found in Lusmagh, Ireland, in 1839, and among these what he considered a small anvil; "an object," Mr. Franks says, "never yet found in England." The other articles were

two bronze hammers, two gouges, two chisels, a ferrule, and a rubber. "Mr Franks conjectured they may have belonged to a native goldsmith."]

This anvil found in Sutherland, now in the Dunrobin collection, would appear therefore to be the first instance of a true ancient bronze anvil being found in Scotland, or indeed in Great Britain.