

ADDITIONAL NOTES ON THE THREE MASSIVE BRONZE OR BRASS
ARMLETS FOUND NEAR ABOYNE, ABERDEENSHIRE. BY JOHN
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Since this paper was written (see page 335), Mr R. H. Soden-Smith, M.A., of the Science and Art Department, South Kensington, who exhibited these armlets to the Archæological Institute, London, in 1864, has kindly sent me the chemical analyses of two of them, made at the time by Professor A. H. Church. These analyses were published in the "Journal of the Chemical Society," London, August 1865, "Analyses of some Bronzes found in Great Britain." The first articles he examined were two bronze needles, found in 1866 at Southwark, believed to be of Romano-British manufacture, also placed in his hands for analysis by Mr Soden-Smith. These gave the result of a compound of copper with a large percentage of zinc and a very small proportion of tin, and Professor Church justly remarks these articles should, correctly speaking, "be termed brass." He then refers to the Celtic armlets, for comparison with these Romano-British articles, as follows:—

"At Aboyne, not long since, three massive bronze armlets were found. The workmanship and design seem to prove them to belong to the period anterior to the Roman possession of Britain. A very small fragment of the metal was taken from these rare and interesting specimens by permission of their owner, the Marchioness of Huntly, and handed to me for analysis by Mr Soden-Smith:—

	Armlet No. 1.	Armlet No. 2.
Copper,	86·49	88·19
Tin,	6·76	3·64
Zinc,	1·44	9·13
Lead,	4·41	...
Loss and oxygen, &c., . . .	·90	...
	<hr/>	<hr/>
	100·00	100·96

“The injurious effects of lead upon brass and bronze are well known. In the present case (of Armlet No. 1) there was marked evidence of a deterioration in the alloy, produced by the large proportion of lead present,—for the armlet, though very massive, had been broken (and mended) at the period of its use. The metal was cracked, the fissures presenting the appearance of some lead-containing bronzes after they have been worked when hot.” (See fig. 29, page 358.)

The analyses of these armlets are of the greatest possible interest, differing as they do from the analysis by Dr Stevenson Macadam of the bronze armlet found in Peeblesshire, the only other armlet of this class which has as yet been analysed. It, however, is a true ancient bronze of copper and tin alone; while these Aboyne armlets show the addition to the copper and tin of a varying percentage of zinc, and also one of them the presence of lead, which not only softens the bronze, but renders it less tough. This brings them thus nearer the character of the more modern brass, which consists of copper and zinc alone. Here, then, we have the same class of massive armlets, showing the analyses of both of these varieties (the bronze and the brass, of the alloys), and therefore indicating the age of some of these armlets as belonging to this transition period, or at least as coming down to this transition period of time.

Mr Joseph Anderson, in his paper “Notes on the Relics of the Viking Period,” vol. x. of our “Proceedings,” gives an excellent summary of what is known on this subject, and I shall quote part of it. He says:—“This change in the composition of the metal from tin-bronze to zinc-bronze is a useful distinction to be noted in considering the age of relics which are of bronze-like metal.” “Zinc,” says Morlot, “is never present

in the bronzes of the Bronze Age, even as an impurity." The researches of Göbel have also shown that zinc is absent even from the Greek bronzes, which are composed of copper, tin, and lead. Zinc only begins to appear as an ingredient in Roman alloys, and it is only towards the commencement of the Christian era that it begins to be present in them" (page 558.)¹

This peculiar class of massive bronze and brass armlets, as far as we can at present judge, belong, therefore, not to the true "Bronze Age," but to the so-called "Iron Age" in Britain, and this seems to agree very well with the probable period of time which I have already stated in my paper, as that to which they appeared, from other reasons, to belong.

The Dowager-Marchioness of Huntly has since been good enough to forward for my examination the three massive armlets in her possession. These three armlets all belong to what I have designated the "Folded or Spiral Pattern" or variety of bronze armlet, and I am now therefore able to describe them in detail, as well as to figure one of the pair of armlets, and also the other, the third armlet, which differs in its ornamentation.

Two of these armlets may be considered a pair, their ornamentation being alike in both, though the one is a little smaller than the other. The pattern resembles closely that of the large armlet found at Auchenbadie, Banffshire, except that both the transverse and oblique projecting ornaments are in comparatively low relief in these armlets, and the transverse ornaments between the oval opening and the front edge of the armlet is single in these, and not double, as in the Auchenbadie armlet, and there are no cord-like ornaments cut between the different bands, of which these armlets are composed (see figs. 29, and plan, fig. 9). I have said that these ornaments on the bars are in lower relief, they are also a little more numerous, there being five ornamented spaces between the

¹ See Morlot's observations entitled "Les Metaux employes dans l'age du Bronze," in the "Mémoires de la Société des Antiquaires du Nord" for 1866, p. 29. Also, for analyses of bronze and brass, see "Kelternes Germanernes og Slavernes Bronzer." By J. E. Wogel, "Antiquarisk Tidsskrift," 1852-1854, Kjobenhaven, 1854; and Professor D. F. Kruse's "Necro-Livonica," Leipzig, 1859.

rounded openings of the armlets, and only four in the Auchenbadie one. There is also no appearance of any moulding or nails near the rounded openings for the attachment of enamelled plates. On the inside of this armlet, however, there is a small nail-like projection between the oval opening and the front edge of the armlet, on one side; while the other shows some slight inequalities, perhaps due to the casting of the armlet.

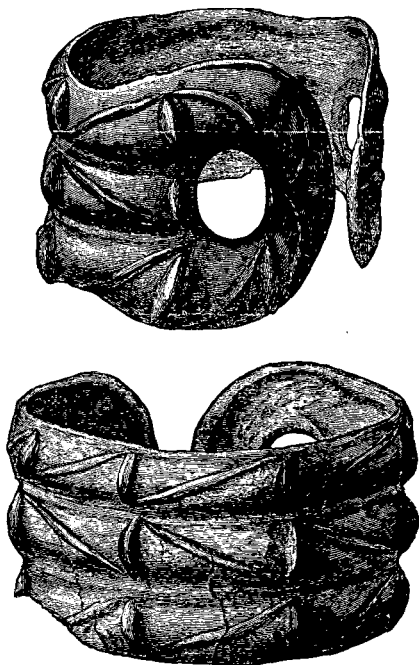


Fig. 29. Brass Armlet found near Aboyne.

This is the armlet (No. 1) which has been analysed by Professor Church, and the analysis is given by me on page 356. It shows a large percentage of tin, a very small percentage of zinc, and a larger percentage of lead. It is not very regular in shape, and appears to have been cracked across the back, probably when cast, and this part has been

strengthened by a large patch of similar metal, which has been apparently run into the grooved inside of the armlet, opposite to the cracked portion, and makes it strong again. (See fig. 29.) This armlet measures about $4\frac{1}{4}$ inches in greatest diameter inside, by about $3\frac{1}{4}$ inches across, $2\frac{1}{4}$ inches across the middle of the back, and 3 inches across each extremity. The edges of this armlet are a good deal worn towards its rounded extremities; one of the rounded openings measures about $\frac{3}{4}$ of an inch across, the other being very slightly larger. It weighs 20 oz. avoirdupois.

The second armlet has unfortunately had one of its extremities torn across and separated from the rest of the armlet, at about $1\frac{1}{2}$ inches distance from the inner margin of the rounded opening. It measures about 4 inches in greatest diameter, by about 3 inches across, $2\frac{1}{4}$ inches across the middle of the back, and nearly 3 inches across its rounded extremities; the rounded openings are a little irregular—one measures about 1 inch across, the other being a very little less. It weighs $14\frac{1}{4}$ oz. avoirdupois. This armlet was also analysed by Professor Church (No. 2, of p. 326), and contains a smaller percentage of tin, a very large percentage of zinc, but no lead. It is also a good deal worn on its edges, and, like the other, the brown colour of the metal is partially covered with a greenish patina.

The third armlet is also covered with a greenish patina over a much more distinctly yellow-coloured metal. Unfortunately, the rounded portion of one extremity of the armlet has been broken off at the commencement of the rounded opening, and this terminal portion is wanting. From the appearance of the fracture this has not been done recently. (See fig. 30.) The pattern of this armlet is much simpler than any of the other armlets described. There is one transverse ornament projecting very slightly from its surface, between the oval opening towards the extremity of the armlet, and its front edge; from this two oblique or curved projections turn round towards the next two transverse ornaments, which are at the other extremity of the rounded opening, and beyond this there are only two very slight, short, transverse, or rather somewhat oblique ornaments, on the two outer bars of the armlet; with indications of long slender oblique ornaments alternating with them; making thus only three

spaces in all, between the one rounded opening and the other. While the central bar running between these two oval openings is apparently quite plain and free from ornament. It differs from the other pair of armlets also, in having a single rather strongly-marked and ornamental twisted cord, which runs in the grooves between each of the three bars of the

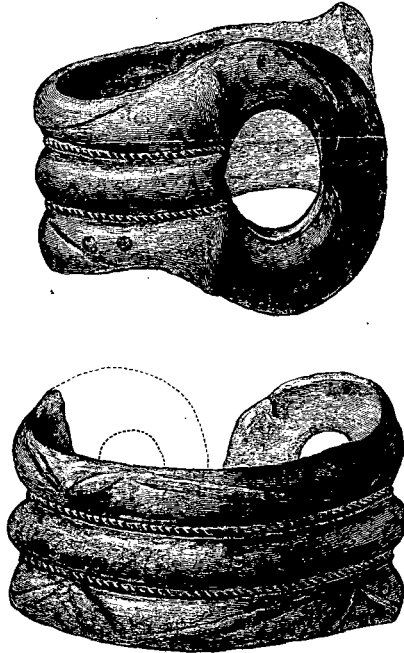


Fig. 30. Brass (?) Armlet found near Aboyne.

armlet. There are two short nail-like projections in one of the outer bars of the armlet, not far from the oval opening, opposite to which the armlet is a good deal worn away at its edge. This armlet has also been drawn unequally out of shape towards its broken extremity. It measures nearly 2 inches across the middle of the back, and rather more than 3 inches

across its rounded extremity, and the rounded opening is larger than in the other armlets, measuring $1\frac{1}{4}$ inches high by $1\frac{1}{4}$ inches across, and it is slightly moulded round the edges, as if to adapt it for enamelled plates. This imperfect armlet now weighs $17\frac{3}{4}$ oz. avoirdupois.

The armlet found in Fifeshire, already described, and this last one, rather differ in style or detail of ornamentation, from the other armlets. This armlet, found near Aboyne, is particularly interesting as showing how completely the whole strength and character of the ornamentation of the other, and probably older armlets, have almost entirely disappeared; mere traces of it only remaining, shall I say, in a weaker and degraded style, to show from whence the original idea of the pattern had been derived; and yet it was apparently found in the immediate neighbourhood of the others, which display the more ordinary style of pattern, though perhaps in a less prominent degree than in some of the other armlets previously described.

These armlets, which I have now described, conclude the account of all the specimens of these particular classes known or yet discovered in Britain, or rather, I should say, in Scotland; for there only, with the exception of a single armlet found in Ireland (to be immediately described), have all these armlets been found. Nowhere else indeed, have armlets of this class been yet discovered.

I have already supposed, from the great size of many of these armlets, that they may have been worn on the upper arm of a man; this indeed was also a well-known fashion of the times of classical antiquity. While the smaller bracelets, those of the true spiral form, &c., may have been worn on the forearm or wrists, and perhaps in some cases by women.