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On some Buildings of the Roman-British Period discovered at Clanville, near Andover, and on a deposit of Pewter Vessels of the same period found at Appleshaw, Hants.

Engleheart, M

Archae. 56, 1898.

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ARCHAEOLOGIA:

OR,

MISCELLANEOUS TRACTS,

&c.

I.—*On some Buildings of the Romano-British Period discovered at Clanville, near Andover, and on a deposit of Pewter Vessels of the same period found at Appleshaw, Hants. By the Rev.* G. H. ENGLEHEART, *M.A. With Appendixes by* CHARLES H. READ, *Esq., Secretary, and* WILLIAM GOWLAND, *Esq., F.S.A., F.C.S., Associate R.S.M.*

Read November 25, 1897.

IN the immediate neighbourhood of my house in the village of Appleshaw, on the north-western border of Hampshire, the sites are unusually close together of those dwellings of the Romano-British period which are, with a certain vagueness, termed Roman villas. Appleshaw is distant five miles north-west from Andover; one mile north of Andover two Roman roads intersect, the one running from Old Sarum north-easterly to Silchester, the other from Winchester north-westerly to Cirencester. At Finkley, close to the point of intersection, pottery and other Roman material has from time to time been unearthed, and the locality is one of those which have, by a somewhat unconvincing reference to the Antonine itinerary and to etymology, been identified with the unascertained site of *Vindomis*. Imagine these two roads at their crossing to stand like an upright capital X over the town of Andover, with that town in the lowest angle; my own nearer neighbourhood will lie in the western or left-hand angle. Three-quarters of a mile east of my house is the lately-examined site upon which I have to report particularly this evening. One mile north and a little west (all the distances mentioned are measured in radius from my house) is a villa on the Redenham estate, excavated some fifty years back by Sir John Pollen, the landowner. It appears that no plans were made and no record kept. A hypocaust cavity is still discernible, its *pilæ* built of circular bricks, and fragments of the suspended floor are still *in situ*, of grey, white, and red *tesseræ*. In the Winchester Museum are a few *tesseræ*

from this site with letters on them, an interesting feature and recalling the inscribed Thruxton pavement from the same district. It is highly probable that this Redenham villa has not been uncovered to its full extent, and that other rooms and perhaps wings of the building await investigation; indeed, I have myself discovered wall-foundations and many roofing-tiles beneath the surface of a field 100 yards south of the excavated portion. One mile south of my house, in a large field sloping up to the high road from Andover to Marlborough, abundant surface-indications, *débris* of stone roof-slabs, brick, flue-tile, etc., show a villa-site, and here I had the good fortune lately to find the deposit of metal vessels exhibited to-night. Similar indications mark another unexplored site on rising ground one and a quarter mile south-east, and little more than half a mile from the Clanville villa. Again, barely two miles south is the well-known Thruxton villa, of which there was uncovered in 1823 what assuredly is but a portion of a probably large and fine building.

Almost within a stone's-throw of my gate is a copse which abounds, over a considerable area, in traces of occupation during the Romano-British period; a spade can scarcely be put to the ground without disclosing pottery, tile, and similar evidences. Roman coins are found there, and among other objects I possess a bronze *fibula* and a *cochleare*, or spoon, of white metal. Examination has led me to think that this was the site not of a villa but of a cluster of huts or cottages, the ancestor, perhaps, of the present village of Appleshaw. To these sites, of all of which I have personal knowledge, I could add two more of which information has lately been brought to me, neither of them more than two miles from my house, making eight within that distance. And to these, again, I could easily add others by going rather further a-field; for instance, four or five miles south to the Abbotts Ann villa excavated in 1854. There is reason to think that the finer portion of this, or possibly a finer house quite near to it, is as yet unexplored.

In January, 1897, word was brought me that in a field a few minutes' walk from my house a ploughman had come upon a large stone with letters on it, and that the plough had grazed a level floor of some kind. The stone, which I at once took into safe custody, bore the roughly-cut inscription M AVR KARINO N CAES, the first inscription to Carinus, it seems, as yet found in Britain. The pavement proved to be that of the southernmost room of the house as afterwards excavated. As the field could without difficulty be rented, a small local committee was formed and subscriptions collected with a view to careful exploration. The Society of Antiquaries kindly granted £10, and Mr. A. H. Lyell, F.S.A., has given his constant interest and personal assistance to the work, which has now been

completed. Mr. Montague Edwards, of Clanville House, has devoted much time to its superintendence. Mr. Lyell has prepared a plan (Plate I., by which my brief and general description may be supplemented in detail.

The site is a beautifully chosen one on the summit, 370 feet above sea-level, of the rising ground between Appleshaw and the hamlet of Clanville, in Weyhill parish, distant from Andover about five miles and two and a half from either of the two Roman roads already mentioned. There is no stream of water near, and no well has been found on the site, but it is probable that the intermittent springs, which in very wet seasons run in the "bottoms" of the neighbourhood, were both more abundant and perennial at a period when the great forests must have caused a far heavier rainfall. The soil of the district is a shallow clay resting on chalk, very baffling to the investigator when sounding for foundations, on account of the natural flints in the staple. I may here mention that the stone of the district is exclusively flint, and therefore fragments of stone roofing-slabs readily catch the eye in the fields, and serve as surface indications of Roman sites.

The general plan of the villa (Plate I.) is the not unusual one of a large court-yard, in rough measurements 66 yards by 50, with detached wings or houses on three sides of it. Two of these lie in ground adjacent to the rented field in which the first discovery was made, and so could not be fully examined. Fortunately the first found building proved to be the dwelling-house proper and of chief interest. This lies on the west side of the court, and is a parallelogram measuring over all about 96 feet by 52, its longer axis lying almost north and south. There are evidences of at least one considerable reconstruction of this wing, and I am inclined to suppose that the rooms as they now appear are a smaller and inferior erection upon the ground plan, which can to some extent be traced, of an older, larger house. Thus the rooms lay round a small court with a peristyle, of which a double row, running north and south, of stone bases still remains almost entire, six a side. But this original peristyle had been curtailed by building the walls of the present rooms over the three northernmost bases on either side; the masonry not only surrounding but actually covering the bases. *Tesseræ* of different sizes and better quality than those of the extant pavements were found in excavating; a solitary one is of fine blue glass, and several clusters of small white *tesseræ*, set in fine and very hard cement, lay on the surface of a pavement to which they bore no reference. Below the pavement of the northernmost room an old wall foundation was found, and almost everywhere under the present floors is a layer of black ash, perhaps marking the destruction by fire of a former building.

The rooms, as now seen, are as follows. The centre of the south end was

occupied by a room 20 feet by 13 feet 6 inches. The pavement must originally have been of some beauty, but a fragment only remains, showing a double guilloche or braid of dull purple, white and red, within a broad border of grey. It can be seen that it was divided into a broad central panel and two narrow ones. The central medallions or designs have entirely perished. At the centre of the opposite north end of the house was a corresponding room of the same dimensions, paved with plain grey *tesseræ*. In this pavement, not in its true centre but a little way out from the middle of the north wall, is a device of three intersecting circles, distinctly worked in the same grey *tesseræ*. If not the mere freak of a workman, this may possibly be something of the nature of a charm or religious symbol. Against the west wall of this room is the rather rare feature of an open brick hearth.

Immediately within the west external wall of the house a narrow corridor ran the whole length of the building, but only its northern portion is paved in plain grey *tesseræ*. The paved portion has been walled off from the rest, perhaps for warmth in the later reconstruction, and gives access to two small and almost square rooms, paved with red, white, and grey *tesseræ* in simple patterns of stripes and chequers. The chess-board design of the smaller of these two rooms is very rudely and irregularly executed over half its area. South of these two rooms and adjacent to the corridor a small oven or furnace of brick and cement, containing a layer of ashes when found, may perhaps indicate the site of a kitchen.

On the opposite side of the colonnaded central space the east length of the house was occupied by two heated rooms, with, probably, the main entrance to the house between them. A large square sandstone block is still *in situ* in the east wall, socketed as if for the reception of a doorpost. A cemented floor in the large outer courtyard, rising in two elevations to the supposed doorway, may be the remains of the ascent to this entrance. Of these two heated rooms that to the north of the entrance has its hypocaust, flues, and furnace-arch in fair preservation, also a portion of suspended floor of red and grey *tesseræ*. The main floor-supports are large masonry blocks of flint and chalk, and flues were carried into the walls at short intervals. The hypocaust of the room south of the entrance has been almost entirely destroyed, probably for the sake of the large square bricks of which its *pilæ* were built. The floor seems to have been of *opus signinum*. Between this room and the south wall of the house was what may have been a small bath or tank, lined with cement. The northernmost end of the colonnaded area is floored with rammed chalk, the remainder, in its present state, is of bare clay.

The masonry of the building is of flint interspersed with large blocks of

chalk, and excellent hard white mortar. The north wall of the best preserved hypocaust is still very perfect, and has a bonding course of large square bricks. The walls all have a well-marked set-off of three courses at the foundation, which is based on pounded chalk and well-worked clay. *Opus signinum* was largely used for the walls and floors. The scheme of colouring of the room walls was chiefly red and white in simple patterns. A very large quantity of plaster was found grooved with shallow intersecting flutings, the ground white with bright red stripes along the hollows. From its rough finish this was probably used on ceilings, or wall-spaces above the eye-line. A broken column with its capital intact, 3 feet in length by 13 inches in diameter of shaft, was found near the centre of the house; when first dug up it showed clear traces of the same red and white colouring.

The north wing of the villa, if for convenience I may use the term "wing" of three separate buildings linked together only by the bounding wall of the quadrangle, is a long narrow structure of irregular form, about 180 feet long and averaging 33 feet broad, divided into many chambers. From its having no floors, and only rough wall foundations of flint, with but little fallen masonry, it is probable that its walls were of timber, and that it comprised the necessary farm-buildings, with accommodation for cattle, grain stores, and the like.

The east wing, so far as it has been excavated, seems to have been similar in form to the last. In length it was perhaps about 110 feet, in breadth 40 feet. No tessellated floors have been discovered in the trenches cut: the floors were probably of mortar. It contained one room with a *suspensura* and a deep-set hypocaust, which, however, has been destroyed to an extent which has made it impossible to ascertain its measurements. This wing may have been the servants' quarters. A surprising number of quite perfect lozenge-shaped stone roofing slabs, many with the nails still in them, were dug up in this wing. There was found here a large urn of the ordinary black ware, 2 feet in height, buried upright in the ground, and covered with a large flanged tile, which had been crushed down to the mouth of the jar by pressure from above, probably of the plough. Six small bronze Roman coins were found in it, mostly adhering to its sides, part perhaps of a large hoard which had been discovered and removed.

On the west side of the villa several curious long pits or trenches were found, the largest some 20 yards in length and about 5 feet across, of an obtusely V-shaped section and 3 feet to 4 feet deep. These were entirely filled with rubbish from the buildings, the largest containing tons of wall plaster. They appear to have been originally puddled with clay and partly lined with the abundant stone roof-slabs.

It has been suggested that they were for gathering surface-water, but they are of strangely irregular form for such a use.

The many objects found in the course of excavation, though full of interest as a local collection, are, with few exceptions, such as may be called normal. The pottery, mostly fragmentary, was chiefly of the ordinary classes and of New Forest ware, with a few pieces of Caistor and "Samian." Window glass was found, blue, green, and white. In iron there were knives and other tools, a finger-ring, and many nondescript articles. In bronze several armlets, one or two plain rings, a pin of uncommon type with a glass paste in its head, but no brooches. Broken bracelets of Kimmeridge shale occurred. Quite a little collection was made of the not unusual footprints of various animals on bricks and tiles. The coins, over fifty in number, range from Domitian to Decentius.

About the set of metal vessels from Appleshaw now exhibited I will say little, since they are submitted for the opinion of experts. It was my curious good fortune to hit upon them at once in a first experimental trench dug on the site already mentioned, one mile south of my house. They appeared to be designedly hidden in a pit sunk through a cement floor, 3 feet below the surface of the field. The smaller vessels were carefully covered by the larger dishes. One suggestion I may make with regard to their date. Lying on the floor below which they were buried was a fragment of wall plaster bearing a peculiar pattern of red flower buds on a white ground, absolutely identical with plaster found in the Clanville Villa. Now the inscribed stone found in the latter proves that the house was inhabited in the year 284 A.D., while the coins cease with Decentius, 351 A.D. Therefore, on the not unreasonable suppositions (1) that the plaster as found represents the wall-decoration of the houses at the time of their destruction or abandonment, (2) that the identity of design shows a correspondence of dates, (3) that the vessels were concealed when the house was abandoned, we may assign the vessels to a period not by many years removed from 350 A.D.

APPENDIX I.

List of Pewter Dishes and Vessels found at Appleshaw and now in the British Museum. By CHARLES H. READ, *Esq., Secretary.*

(The numbers are those of the Museum Register.)

THE remarkable set of pewter vessels, or *ministerium*, that Mr. Engleheart has been fortunate enough to light upon form a very valuable addition to the series of the same kind in the British Museum, where they are now preserved. They consist, as may be seen from the detailed list appended, of a number of large flat dishes, mostly circular in shape, one only being square, drinking cups, bowls, and small dishes, all apparently for use at the table, either for eating or drinking. Assuming that the whole service is before us, as is very possible, it is interesting to note how much more numerous are the large dishes, that were common to all the guests, than those appropriated to individuals. Interesting comparisons may be made between these and the far more luxurious services from Chaource in the south of France (in the British Museum) and the Bosco Reale hoard in the Museum of the Louvre.

Many of the shapes of the Appleshaw service are common in pottery, such as the drinking cup No. 15 (fig. 7) and the flanged bowl No. 18 (fig. 8). The former is a typical form of cup among the New Forest pottery, and is also found in Caistor ware. The flanged bowl is often made in "Samian" ware. The flange would adapt it for being placed within another vessel on the edges of which the flange would rest, and the contents of the bowl would be kept warm without direct contact with either fire or water. The small oval dish No. 32 (fig. 9), apparently used for fish, is also found in Samian ware, though it is perhaps more strictly a metal shape. A very similar dish in silver from Egypt is preserved in the British Museum. The chalice-like cup No. 12 (fig. 6) is unusual, and the broad foot and edge curved outwards seem scarcely adapted for a drinking vessel. The Roman potters appear to have been unable to produce large dishes of the size of those before us, and sufficiently thin to be practically useful. Their efforts in this direction were either in metal or glass.

An uncommon feature in the dishes from Appleshaw is the ornamental designs, mostly of geometrical construction, with which they are embellished.

They appear to have been produced by following the lines of the pattern with a wedge-shaped punch, much like a broken penknife, and the design was afterwards emphasized by filling it with what Mr. Gowland has determined to be a bituminous material, not niello as would have been expected. Like the Roman silver plate, all the circular objects were finished on the lathe, which in such a soft material as pewter readily allowed the workman to relieve the broad flat surface with concentric circles and other devices.

It is perhaps not very profitable to speculate on the reasons that induced the owner of this service to conceal it in so deliberate a way; but the hiding would seem to have been carried out in a business-like manner, as if it were intended to recover the property later. The owner, therefore, was probably not driven away by any sudden panic, but rather by a distant, though certain, danger that would in time pass by and allow him to return to his home. Parallels may readily be found in the state of things in England during the Commonwealth troubles. It is somewhat curious that a similar large pewter service was found at Icklingham, in Suffolk, about the year 1840, though in this case the objects were dispersed. Here also the hiding of the pieces seem to have been deliberately and carefully carried out. A number of the specimens have from time to time come to the British Museum, and we have now more than forty pieces which either certainly or very probably came from this find: of these twelve are dishes ranging from 15 inches downwards, one only being square, as in the Appleshaw hoard, the others are bowls, circular or octagonal, saucers, cups, etc.

Another find of dishes and vessels took place about 1858 at Sutton, in the Isle of Ely, and of these the British Museum has six large dishes, of diameters from 1 foot 7 inches to 1 foot. Mr. Marshall Fisher, of Ely, has a number of pieces from the same find, among them a good octagonal cup. These were exhibited to the Society in 1870.[a]

Of minor finds preserved in the British Museum it will be sufficient to mention the following: Two large dishes found at Southwark, with the name "Martinus" scratched on them; two cups from Cambridgeshire, one found on Coldham Common and the other from a Saxon cemetery; and two lamp-stands and a cylindrical vessel from Colchester. A double cone-shaped vessel found, containing 1,500 coins, from Constantine to Gratianus, and probably deposited about 376 A.D., is figured in *Proceedings*.[b] A very large dish with a circular panel in the middle, filled with chequer design, probably of the same work as the Appleshaw pieces, and found at Welney, is in private possession.

[a] *Proceedings*, 2nd S. iv. 425.

[b] 2nd S. xii. 56.

1. Circular dish (*lanx*) $19\frac{3}{4}$ inches in diameter; narrow border $\frac{1}{3}$ inch wide thickened at the edge; raised circle at back.
2. Similar, but very imperfect at the edges. Present diameter 20 inches; originally about 22 inches. In the centre is a circular medallion with a geometrical design in outline filled with black matter. The greater part of the lines have been produced with a wedge-shaped punch about 0·08 inch long; raised circle at back.

Fig. 1. Central ornament of dish No. 2. ($\frac{1}{2}$.)

Fig. 2. Central ornament and border of dish No. 4. ($\frac{1}{2}$.)

3. Similar, also much decayed; present diameter $19\frac{1}{2}$ inches; originally $20\frac{1}{2}$ inches. In the centre moulded circle 3 inches in diameter; moulded border, thickened at the edge; raised circle at back.
4. Similar, the metal much decomposed; $18\frac{1}{2}$ inches in diameter. In the centre a circular medallion, $5\frac{1}{8}$ inches in diameter, similar in design to that on No. 2, and produced in the same way, but without the black matter. The border is likewise ornamented with a running scroll, of the same work and the edge is much thickened; raised circle at back.

5. Similar, much decomposed at one edge, but the metal elsewhere in excellent state; diameter $18\frac{1}{4}$; plain border with thickened edge $1\frac{1}{2}$ inches wide. In the centre concentric circles, the largest $6\frac{1}{8}$ inches in diameter; raised circle at back.
6. Similar, one side decayed; diameter, $18\frac{1}{4}$ inches, border 1 inch; quite plain; circle at back.
7. Similar, diameter, $17\frac{5}{8}$ inches. In the centre a circular medallion, $5\frac{1}{8}$ inches in diameter, with an outline plaited chequer pattern, the squares containing reversed coils or circles. The lines are punched or engraved, as in the foregoing examples. Stout outer edge stamped with circles.
8. Similar, much decayed; edge entirely gone. Original diameter, about 18 inches. Quite plain; circle at back.
9. Similar, one side decayed; diameter, 16 inches. In the centre a circular medallion with two interlocked squares. Stout outer edge with stamped scallop border.
10. Similar, diameter, $14\frac{3}{4}$ inches. Central design like that on No. 7; crescents stamped on edge.

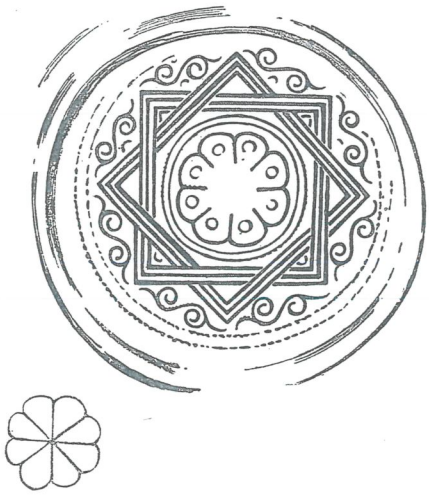

Fig. 3. Central ornament of dish No. 9. ($\frac{1}{2}$.)

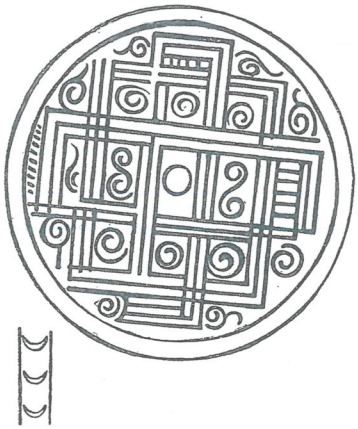

Fig. 4. Central ornament of dish No. 10. ($\frac{1}{2}$.)

11. Square dish (*lanæ*), with semicircular projection at the middle of each side; the hollowed middle is circular. Diameter, $15\frac{1}{2}$ inches. On the back, in the centre, a compass drawn circle, divided by semicircles, so as to produce a Maltese cross.

12. Chalice-shaped cup; shaped bowl, cylindrical stem with moulding round middle; circular foot, $5\frac{3}{8}$ inches in diameter; height, $4\frac{1}{2}$ inches.

13. Octagonal jug, with narrow neck and foot. Round the neck a projecting band with punched design between wavy lines. Present height, $10\frac{1}{4}$ inches. Handle now lost, the plate which attached it to the body is heart-shaped.

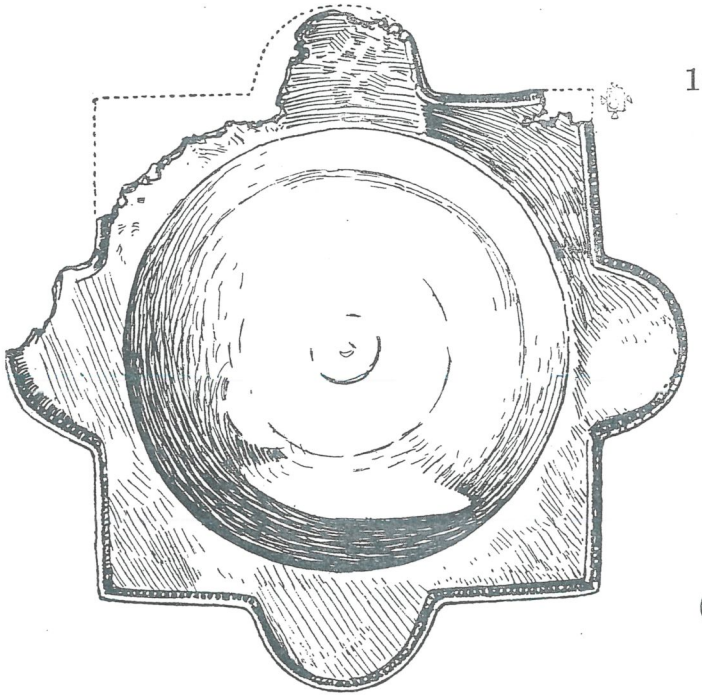

Fig. 5. Shaped dish, No. 11. ($\frac{1}{4}$.)

Fig. 6. Cup on broad foot, No. 12. ($\frac{1}{2}$.)

14. Portion of a jug of similar general form, but circular; stout handle of triangular section. On the side is scratched VICTRICI. Height, 7 inches.

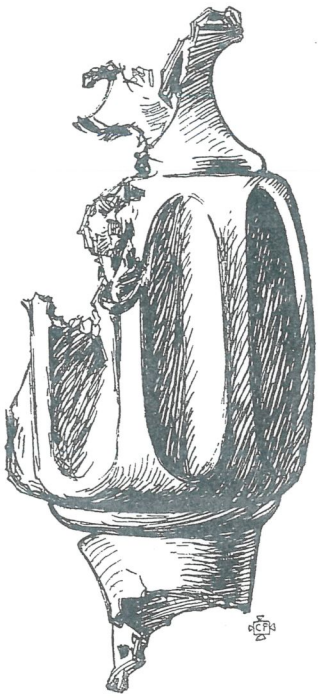

Fig. 7. Drinking cup, No. 15. ($\frac{1}{2}$.)

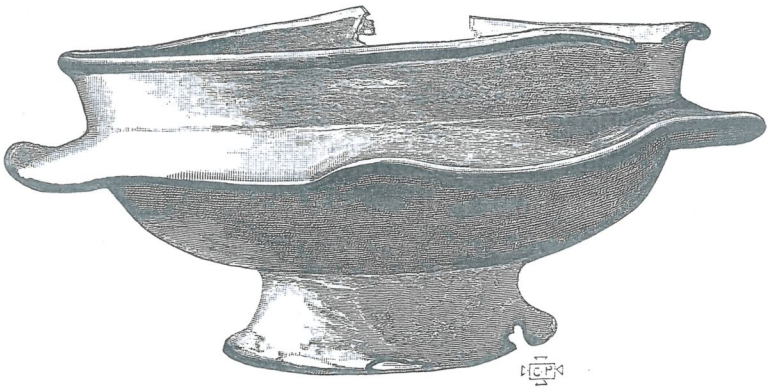

Fig. 8. Bowl with broad flange, No. 18. ($\frac{1}{2}$.)

15. Drinking cup, contracted at the top and bottom, and having vertical channels on the body to make it easier to hold. Condition very fragmentary. Height, $7\frac{3}{4}$ inches.[a]
16. Part of cup, contracting gradually from top to bottom. Height, $2\frac{1}{2}$ inches.
17. Part of a similar cup. Height, $2\frac{1}{2}$ inches.
18. Bowl on small foot; 1 inch below the lip is a horizontal flange 1 inch wide. Height, $3\frac{3}{4}$ inches.; diameter, 8 inches.
19. Similar bowl on a smaller scale. Height, $1\frac{7}{8}$ inch; diameter, 5 inches.

Fig. 9. Dish of tin, No. 32. ($\frac{1}{2}$.)

20. Similar bowl. Same size.
21. Hemispherical bowl with flat edge, thickened at the rim; small foot. Height, 2 inches; diameter 6 inches.
22. Similar bowl. Height, $2\frac{1}{2}$ inches; diameter, $5\frac{3}{4}$ inches.
23. Similar bowl. Height, 2 inches; diameter, $6\frac{1}{8}$ inches.
24. Similar bowl. Height, $2\frac{1}{8}$ inches; diameter, 4 inches.
25. Hemispherical bowl, with narrow thick edge, short foot rim. Height, 2 inches; diameter, 5 inches.
26. Saucer, with nearly upright sides, $1\frac{1}{8}$ inch high. Raised circle on bottom. Diameter, $5\frac{3}{4}$ inches.
27. Portion of low vase, probably of oval section; foot rim. Height, $2\frac{1}{2}$ inches; diameter uncertain, about 8 inches.
28. Saucer like No. 26. Height, $\frac{3}{4}$ inch; diameter, $4\frac{1}{4}$ inches.
29. Small plate, circular, with concentric mouldings and edge stamped with scallops; in centre an eight-foil. Diameter, $6\frac{1}{2}$ inches.
30. Deep dish, plain, thickened edge, faint ring on back. Diameter, 10 inches.
31. Small plate, thick and heavy; reel moulding on edge. Diameter, 6 inches.
32. Oval dish, with flat handle at one end (the other imperfect); ornament in relief, a fish within an oval border of interlacing pattern. Present length, $7\frac{3}{4}$ inches; originally 9 inches. This piece, though now much decayed, was probably the most elegantly formed and tasteful of all the objects in the hoard.

[a] Compare New Forest pottery, *Archæologia*, xxxv. pl. III. fig. 6.

APPENDIX II.

Analyses of Metal Vessels found at Appleshaw, Hants. and of some other Specimens of Roman Pewter.[a] *By* WILLIAM GOWLAND, *Esq., Associate R.S.M., F.S.A., F.C.S.*

THE description of the metal vessels found at Appleshaw given by Mr. C. H. Read in the preceding pages renders a detailed account of those I have analysed superfluous. I hence merely append to each the number, etc., under which its description will be found in his list, and will confine my remarks chiefly to the composition of the vessels, and to their classification and comparison with other examples of Roman pewter, according to the relative proportions of tin and lead which they contain.

Several of the vessels are in a very perfect state of preservation, but others are more or less corroded and converted into tin oxide and lead carbonate. Generally in the latter, even in the much oxidised parts, a thin core of unaltered metal is left, and this is thickly coated with a greyish white incrustation having the above composition. A few, however, and parts of others, when they were unearthed, consisted solely of this oxidised matter, no trace of metal remaining.

Seven specimens representative of the various kinds of vessels in the collection were selected for chemical analysis. Three other vessels of Roman pewter in the British Musuem from other localities were also analysed[b] for comparison with them.

[a] The term "pewter," in its strict or specific sense, is applied generally to two alloys of tin and lead of the following compositions:

English pewter: tin, 80 per cent., lead, 20 per cent.
French ,, ,, 83·5 ,, ,, 16·5 to 18 per cent.

In this paper the term is used generically for the sake of convenience, and includes tin-lead alloys, in which the proportions of the metals differ somewhat from the above.

[b] For permission to make these analyses I am indebted to the courtesy of our Secretary, Mr. C. H. Read.

I have besides collected all the published analyses (five only) of ancient tin-lead alloys which have been hitherto made and have inserted them together with the above in Table I. with the same object.

It is very remarkable that Roman pewter has been so rarely submitted to chemical analysis, as vessels of soft white metal have been discovered from time to time in various localities, yet in all, excepting these five cases, we find them simply described as being of tin or lead, descriptions which cannot be relied on, as they are based solely on the very deceptive external characters of the metal.

The vessels from Appleshaw were analysed with the following results:

No. 32, fig. 9. A small oval dish, slightly imperfect, bearing ornamental designs. Not much oxidised. Size about 9 by $4\frac{1}{2}$ inches.

Composition:

Tin.	Lead.	Iron.	Oxygen, carbonic acid, and loss.
99·18	0·14	trace	0·68

It consists of practically pure tin.

No. 27. Part of a bowl with low foot. Size originally about $2\frac{1}{2}$ inches high and about 8 inches diameter.

Composition:

Tin.	Lead.	Iron.	Copper.	Oxygen, carbonic acid, and loss.
94·35	5·06	trace	trace	0·59

This is an alloy of tin and lead containing a smaller proportion of lead than a true pewter.

The extraordinary molecular change which the metal of this vessel has undergone is of more interest to the physicist and metallurgist than to the antiquary; a brief note respecting it, however, cannot be omitted here. The metal is not much oxidised, yet it is so exceedingly brittle that it can be easily broken with the fingers. The effect of time upon it has resulted in a complete alteration of its molecular structure, the mass of the alloy being converted into an agglomeration of crystals, and to this its brittleness is due. On melting and casting a small fragment I found that the crystalline structure disappeared and the metal regained its original toughness.

No. 2, fig. 1. A large circular dish. Much corroded. Original diameter about 22 inches.

Composition:

Tin.	Lead.	Iron.	Oxygen, carbonic acid, and loss.
90.55	8·31	trace	1·14

This also contains less lead than a true pewter.

It is difficult to account for the comparatively small percentages of lead in this and the preceding alloy, unless we assume that in these cases adulterated tin was used, the cheaper metal lead being present as an adulterant of the more expensive metal tin. This is by no means an unreasonable assumption, tin thus adulterated being not altogether unknown at the present day; but more especially, as of all tin lead alloys those containing from 5 to 10 per cent. of lead are the least useful, having the least extensibility, *i.e.* they cannot be beaten out with the hammer so easily as the others without fracture, a defect which would not have escaped the observation of the Romans.

No. 12, fig. 6. A chalice-shaped cup 4½ inches high.

Composition:

Tin.	Lead.	Iron.	Oxygen, carbonic acid, and loss.
76·41	23·04	trace	0·55

This approaches closely to English pewter in composition, and, as will be shown subsequently, it is one of the typical Roman pewters.

No. 28. A small shallow dish bearing the Christian monogram "Chi Rho." Diameter 4¼ inches.

Composition:

Tin.	Lead.	Iron.	Oxygen, carbonic acid and loss.
72·36	26·09	trace	1·55

When examined under the microscope, numerous minute cavities containing a yellowish incrustation, the result of oxidation, were seen to be scattered through the mass of the metal.

No. 19. A flanged cup, on a low foot, 4⅜ inches diameter, 2 inches high.

Composition:

Tin.	Lead.	Iron.	Oxygen, carbonic acid and loss.
70·58	27·62	trace	1·80

This metal also contained microscopic cavities full of oxidised matter.

The last two alloys represent the type of pewter which seems to have been most in favour with the Romans.

No. 4, fig. 2. A large circular dish. Much corroded. Diameter 18½ inches.

Composition:

Tin.	Lead.	Iron.	Oxygen, carbonic acid and loss.
64·75	34·66	trace	0·59

An alloy practically identical with the "fine" solder of the modern tinner.

From the interesting character of the results obtained from the examination of the Appleshaw vessels it seemed highly probable that additional analyses, especially of specimens from other localities, would throw still further light on the composition of Roman pewter. The three analyses which follow were therefore made.

A square dish. Found at Icklingham (Suffolk). Without ornament, excepting a beaded edge, and plain concentric rings near centre. Breadth 14½ inches.

Composition:

Tin.	Lead.	Iron.	Copper.	Oxygen, carbonic acid and loss.
71·80	27·32	trace	trace	0·88

A shallow circular plate. Found at Southwark. Without ornament. Marked MARTINUS. Diameter 11½ inches.

Composition:

Tin.	Lead.	Iron.	Oxygen, carbonic acid and loss.
72·90	26·75	trace	0·35

Octagonal dish. Found at Icklingham (Suffolk) with many other vessels, without ornament, excepting concentric circles near centre. Breadth 9½ inches.

Composition:

Tin.	Lead.	Iron.	Copper.	Oxygen, carbonic acid and loss.
45·74	53·34	trace	trace	0·92

The excessive amount of lead present in this is curious, as the dish from its form and ornament was apparently not intended for common purposes, and we would therefore have expected it to have been made of an alloy much richer in tin.

It may be well now, for the sake of a clear comprehension of the preceding results and of the deductions to be drawn from them, to collect them in tabular form. I have hence arranged in the following Table, in consecutive order according to the percentage of tin present, all the foregoing analyses as well as all those of similar metal which have been previously published. The Table thus represents all that we know at present of the composition of Roman pewter and other tin-lead alloys.

Analyses of Metal Vessels found at Appleshaw (Hants.)

TABLE I.

Analyses of Roman Pewter and other Tin-Lead Alloys, etc.

(The objects are all in the British Museum, excepting Nos. 2 and 13.)

Tin.	Lead.	Iron.	Copper.	Oxygen, Carbonic Acid, and loss.	Total.	Analyst.	Locality.	Object.
)9·18	·14	trace	—	·68	100·0	Gowland	Appleshaw (Hants)	Oval dish. No. 32.
)5·81	3·79	—	—	—	99·6	Erdmain	Langbro', near Stockholm	Large broken ring. Weight, 510 grams. Found in a peat bog, with bronze celts and ornaments.[a]
)4·35	5·06	trace	—	·59	100·0	Gowland	Appleshaw (Hants)	Part of a bowl on low foot. No. 27.
)0·55	8 31	trace	—	1·14	100·0	Gowland	Appleshaw (Hants)	Large circular dish. No. 2.
'9·50	20·80	—	—	—	100·3	Tookey	Thames, Battersea	Cake of metal, bearing a Roman stamp.[b]
'8·66	21·34	—	—	—	100·0	Macadam	Morayshire	Pieces of metal found with bronze weapons and armlets.[c]
6·41	23·04	trace	—	·55	100·0	Gowland	Appleshaw (Hants)	Chalice-shaped cup. No. 12.
2·90	26·75	trace	—	·35	100·0	Gowland	Southwark	Circular plate marked MARTINUS.
2·36	26·09	trace	—	1·55	100·0	Gowland	Appleshaw (Hants)	Small dish, with "Chi Rho" symbol. No. 28.
1·80	27·32	trace	trace	·88	100 0	Gowland	Icklingham (Suffolk)	Square dish.
1·74	28·26	—	—	—	100·0	Tookey	Thames, Battersea	Cake of metal similar to No. 5, bearing a similar stamp, and also the "Chi Rho" symbol.[b]
0·58	27·62	trace	—	1·80	100·0	Gowland	Appleshaw (Hants)	Flanged cup on foot. No. 19.
9·68	30·42	—	—	—	100·0	Anfrye	Néris, near Montluçon, France	Handle of a vase found in the ruins of a Roman villa.[d]
4·75	34·66	trace	—	·59	100·0	Gowland	Appleshaw (Hants)	Large circular dish. No. 4.
5·74	53·34	trace	trace	·92	100·0	Gowland	Icklingham (Suffolk)	Octagonal dish.

[a] *Proceedings of the Society of Antiquaries of Scotland*, ix. 441.
[b] *Proceedings of the Society of Antiquaries of London*, 2nd Series, ii. 235.
[c] *Proceedings of the Society of Antiquaries of Scotland*, ix. 435 *et seq.*
[d] G. Bapst, *L'Etain*, p. 41.

A cursory glance at this table would seem to show an irreconcileable irregularity in the proportions of tin and lead contained in the specimens, but, on careful study, it will be seen that this irregularity is more apparent than real, and that the objects are by no means all of haphazard composition, but in the majority of cases their constituent metals have been mixed in definite proportions to form definite alloys.

In order to make this perfectly evident it will be necessary to consider briefly an important feature in the nature of the alloys of tin and lead, as well as the conditions under which they would be made by the Romans.

When an alloy of these two metals is prepared it is only uniform in composition during the time it is in a molten state. As soon as it begins to solidify, as when it is cast, segregation of the constituent metals commences and continues until complete solidification of the casting has taken place. Hence the vessel or object which has been cast is not of the same composition throughout, but contains in different parts different percentages of tin and consequently of lead also.

The amount of this variation depends on the size of the vessel. In the smaller vessels found at Appleshaw it would not be less than about two per cent., and in the larger might reach four per cent. of tin; so that analyses made of different parts of the vessels might vary by these amounts.

It must also be remembered that vessels deviating somewhat in composition from the definite alloys would result whenever old worn-out pieces, the composition of which could not be accurately known, were remelted with new metal, a practice universally followed by founders in all times. Another cause of deviation from standard compositions would be the use of impure tin.

If we now examine the analyses in the table, giving due weight to these sources of irregularity in the composition of the alloys, we will find that the greater number of the specimens may be placed in one or the other of the two following groups, A and B, each characterised by a special percentage of tin:

Group A, embracing Nos. 8, 9, 10, 11, 12, and 13, having an average composition of tin 71·5, lead 27·8.

Group B, embracing Nos. 5, 6, and 7, with an average composition of tin 78·2, lead 21·7.

We may therefore, I think, without assigning undue importance to the deductions to be drawn from such a small number of analyses as those given in the table, reasonably conclude that the pewter usually employed by the Romans during

the period of their occupation of Britain, was the alloy represented by Group A, and that the alloy, richer in tin, of Group B, was known but less frequently used.

It is worthy of note here that the most tenacious alloy of tin and lead closely approaches these Roman pewters in composition, a fact which bears important testimony to the knowledge of the properties of metals possessed by the Romans. In the preparation of these two pewters the Romans seem to have followed the practice, which still survives in some foundries, of taking one pound (*libra*) of the chief metal and allotting the quantity of the other metal to be mixed with it in the sub-divisions of a pound (*unciæ*). Thus the pewter of Group A was evidently made by melting together 1 *libra* of tin with 4½ *unciæ* of lead, which, with due allowance for the oxidation of part of the tin, would yield an alloy of that composition. Pewter B was similarly the result of melting 1 *libra* of tin with 3 *unciæ* of lead. Both these kinds of pewter are represented in the two cakes of unwrought metal, Nos. 5 and 11, Table I., the latter consisting of A, and the former of B. From the stamp which these cakes bear they were attributed by our late President, Sir Wollaston Franks, to the fourth century, hence at that time both pewters were in use. It also deserves to be noticed here that the small dish from Appleshaw (No. 9, Table I.), which bears the Christian symbol "Chi Rho," is of precisely the same composition as the cake No. 11, which is marked with the same symbol.

As regards the other specimens in the table, Nos. 3 and 4, I think, for the reasons already given, consist of adulterated tin.

Nos. 14 and 15, however, are undoubtedly intentional alloys. They are respectively of the same approximate composition as the two alloys mentioned by Pliny under the name *argentarium*, one of which was made by melting together tin and lead in equal proportions, and the other by melting an alloy of two parts of lead and one of tin, with an equal weight of the latter metal, its composition thus being tin 66·6, lead 33·3. No 14 corresponds with the latter, which Pliny states was employed by dishonest persons (*improbiores*) for tinning, and No. 15 with the former, which was probably used as solder. That both these alloys were quite unfit for making domestic vessels on account of their poisonous properties, due to the large percentage of lead, cannot have been unknown to the Romans; their use for these two dishes does not hence admit of a satisfactory explanation.

As regards the date of the first use of pewter or tin-lead alloys in Britain, I may say, that so far as my investigations have gone, I have failed to find any satisfactory evidence of their employment before the Roman occupation. The pieces of metal (No. 6, Table I.) found in Morayshire might from their association with bronze weapons and armlets be attributed to an earlier date, but the con-

temporaneity of all the objects in that find is open to doubt, and, the fragments being identical in composition with ordinary Roman pewter, evidently belong to Roman times. Neither have I succeeded in tracing discoveries of specimens of pewter of earlier date in continental Europe, the broken ring No. 2, Table I., found in Sweden not being an alloy but simply impure tin.

Among the Romans alloys of tin and lead were certainly known in the time of Pliny, and although neither of the pewters A and B, afterwards in use, are specially mentioned by him, yet from some of his statements, notwithstanding their obscurity, I think we may infer that vessels of pewter were in use in his day.

Writers earlier than Pliny give us but little help in the elucidation of this matter. Plautus, it is true, as early as the second century B.C. describes a banquet as having been served in *vasis stagneis*, but it is doubtful whether by *stagneis* he means tin or pewter.

Touching the date of the vessels found at Appleshaw it is impossible to be very precise. The identity of composition of the small dish (No. 28, page 12) and the cake of metal (No. 11, Table I.), and both also bearing the same symbol, would seem to indicate that they may be of similar age. If this assumption is correct, then this dish may be attributed approximately to the fourth century.

Nos. 12 and 19, pages 11, 12, and No. 4, page 9, possibly do not differ widely from it in date.

As regards No. 32, page 12, it is extremely probable that it is the oldest piece in the collection, as it consists of practically pure tin, which was doubtless first used in Britain without the addition of lead in the fabrication of vessels; whilst if I may be correct in regarding No. 27, page 12, and No. 2, page 9, as having been made of adulterated tin, they should be older than the vessels which consist of the definite alloys.

I have also examined the ornamental designs found on the largest dish (No. 2) from Appleshaw. They are executed in incised lines which have been made with a chisel used as a punch. The incisions were then filled with a black material resembling "niello" in appearance, so as to form a flat inlay. This black material on examination was found to be free from metallic or mineral matter, and to consist simply of bitumen coloured with some organic pigment of the nature of lamp-black.