

THE SHALE INDUSTRIES AT KIMMERIDGE, DORSET.

By HENRIETTA F. DAVIES

In these notes evidence is brought forward to show that two distinct shale industries have been carried on at Kimmeridge in Dorset differing from each other in the objects produced and the tools used in their manufacture, in the associated pottery, and in the strata in which they lie; the earlier industry dating from the beginning of the Early Iron Age, the latter from the early part of the Roman occupation of Britain.

Kimmeridge 'coal money,' or, more correctly, chucks of shale left on the lathe after turning, has been described and accurately figured for well over 100 years,¹ and its association with Roman pottery has been recognized for nearly as long.² But the hand-cut shale objects from the same cliffs have been one of the Cinderellas of the Archaeological family. And, even when a drawing of them appears,³ no indication is given of their level in the cliff nor of the nature of the pottery which lies with them.

J. H. Austin, in his paper in 1856, figures and describes many forms of chucks, and notes the association of 'flint chippings' with them. He suggests the possibility of the use of the flints in turning the shale.

No deductions as to the relative ages of hand-cut and lathe-turned objects can be drawn from the shale found at Glastonbury,⁴ as they occur together. Mr. H. St. George considers it 'reasonable to suppose that examples bearing evidence of knife cutting were shaped in the village, but again there is no direct proof of this.' No shale chips are described.

¹ W. A. Miles, *A description of the Deverel Barrow* (1825).

² J. Sydenham, in *Arch. Journ.*, i (1845), 347.

³ J. H. Austin in the *Purbeck Society Papers* (1856), 221.

⁴ *Glastonbury Lake-village*, p. 261. H. St. George Gray.

At Hengistbury Head¹ the hand-cut shale was associated with pottery of the third and fourth centuries B.C. There is no evidence that either the hand-cut or the lathe-turned shale was worked here, as the presence of chucks without chips is not conclusive.

But there was one observer who recognized the essential difference between the two groups of objects, although his inferences were drawn from the examination of tumuli in Derbyshire and not of the Kimmeridge cliffs. T. Bateman,² in an interesting paper written in 1846, suggested that a Kimmeridge shale industry, earlier than that of Roman times, had existed. After carefully describing some necklace beads, said to be of Kimmeridge coal, found in tumuli in Derbyshire, he says: 'The obvious and undeniable inferences to be deduced from these facts are, that these decorations of Kimmeridge coal were in use at a remote period shortly previous to the disuse of flint weapons. It is quite evident that these articles had never received their form from the lathe, as the armlets of Kimmeridge coal are clearly proved to have done; this, coupled with the fact that the perforation through the length of the bead is in no instance carried through from one end, but is bored each way towards the centre (as would be the case if a rude drill of flint were used for the purpose), bespeaks a far more remote period than the one in which the use of the lathe was prevalent.'

By looking at the shale in its undisturbed position in the Kimmeridge Cliff evidence has been collected which indicates that this inference drawn by T. Bateman from his beads in Derbyshire tumuli ninety years ago is correct.

The following notes are the result of an examination of the upper 5 ft. of the cliff face in Kimmeridge Bay, Dorset.

No excavation from the surface was undertaken. About a foot of the cliff face was removed in the parts

¹ *Excavations at Hengistbury Head, Hampshire*, 1911-12, p. 63. J. P. Bushe Fox.

² *Journ. Brit. Arch. Assoc.*, ii (1847), 234.

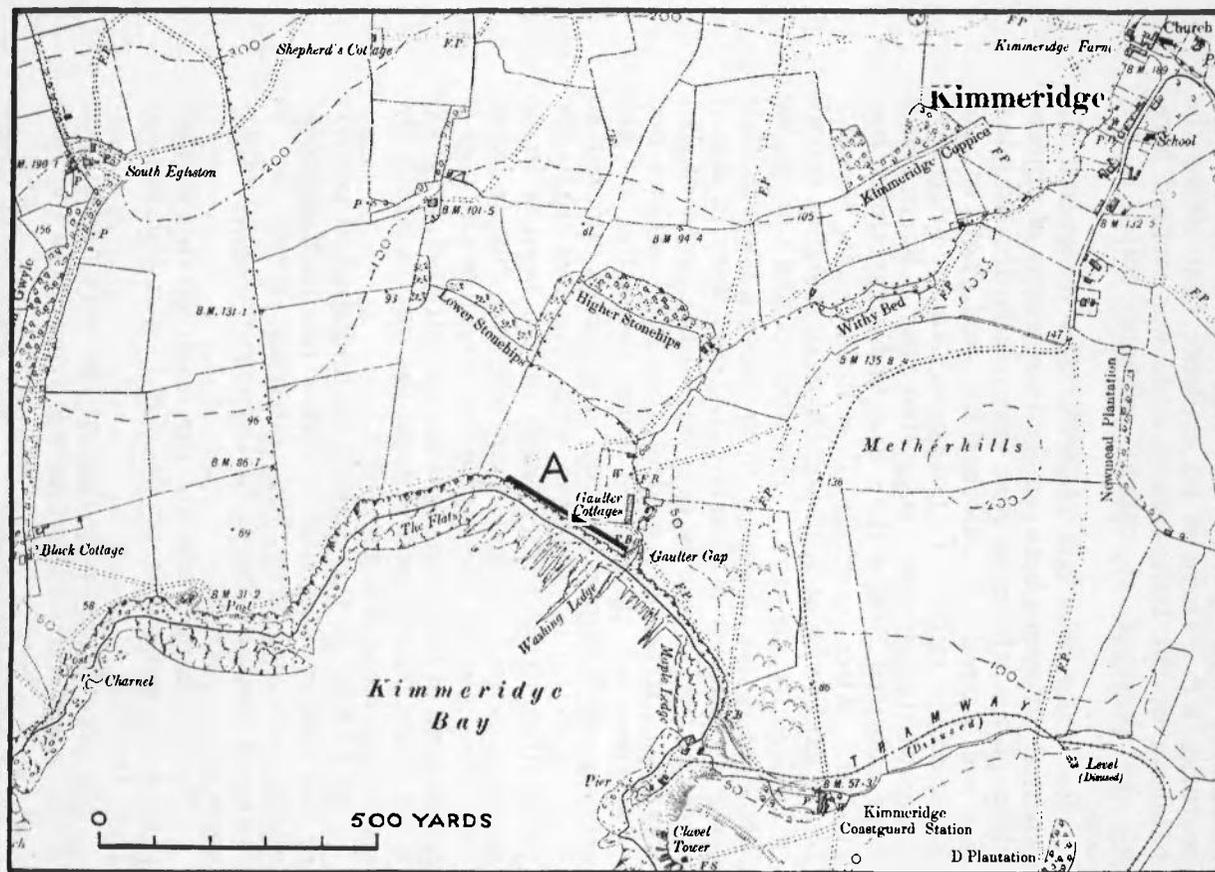


FIG. I

From the O.S. 6-inch map, Dorset LV.S.E., by permission of the Controller of H.M. Stationery Office

examined. The site lies immediately to the west of the stream entering the sea at Gaulter Gap, in Kimmeridge Bay. It extends westwards for about 240 yards. From the occasional presence of Roman sherds and chucks in the cottage gardens and by the stream, it is inferred that the settlement ran inland for at least 200 yards.

The upper part of the cliff is sufficiently sloping to allow one to cling fairly comfortably to its surface. The face can be seen most easily where the winter land-slides have left a clean section. In other places it is often necessary to shift a good deal of fallen earth before the shale can be seen in its original position. It is tantalizing to find sherds and shale of particular interest in this earth, and to be unable to refer them with certainty to their true level.

The whole 240 yards has not been examined. Seven separate sections have been uncovered, varying in length from 11 to 33 ft. These were chosen partly for ease of access and partly for some unusual feature of interest. It is hoped to uncover further sections later.

Kimmeridge shale, or Blackstone as it is called locally, appears on the cliff in two places near Kimmeridge Bay. About a mile to the West a 2-ft. band slopes down the cliff westwards till it reaches the shore under Gad Cliff. This layer is not good for working, being coarse and brittle.

The shale used for turning comes from Hen Cliff, about half a mile to the east of the site, just outside the limits of the bay. Starting from the top of the cliff it reaches the shore about a mile further east. Water-worn nodules of shale are very plentiful below this cliff and to a lesser extent in Kimmeridge Bay. Fig. 1 shows the positions of the site.

SECTION THROUGH THE FIRST FIVE FEET OF THE CLIFF
AT 'A' ON FIG. 1

The earth is from $1\frac{1}{2}$ to 3 ft. deep and rests upon thick yellow clay.

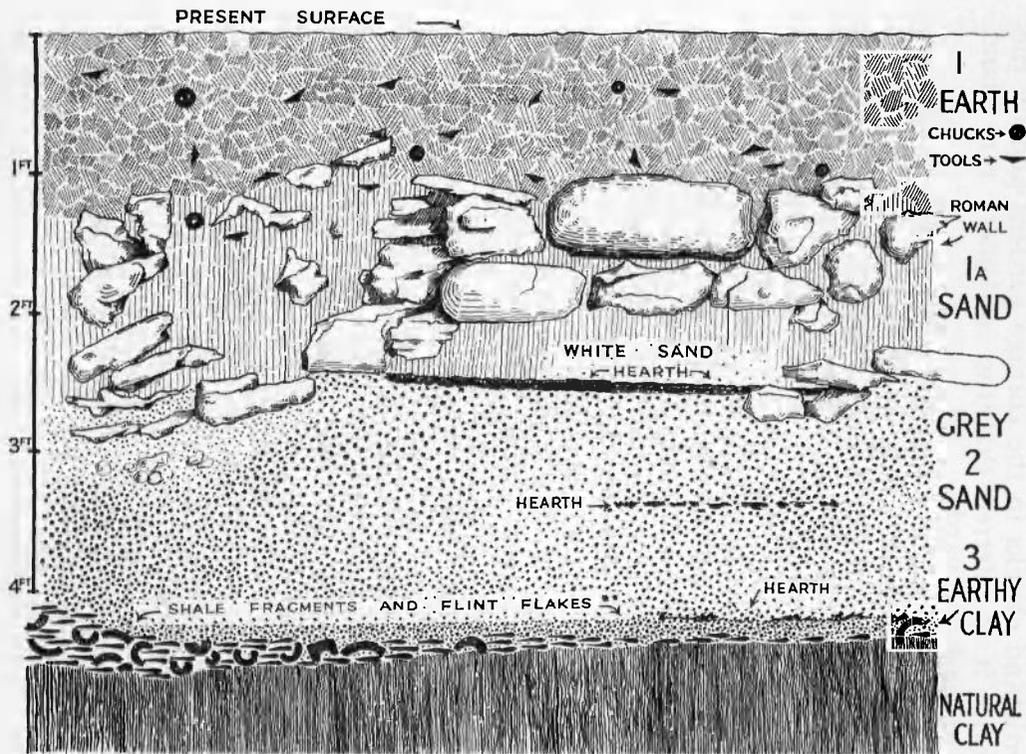


FIG. 2. THE CLIFF-FACE, AREA 6

In three places a layer of sand, from 1 to 2 ft. deep, lies between the earth and the clay. These parts of the site are referred to as Areas 2, 4 and 6. Area 4 has not been examined closely and except for noting that a hearth can be seen running across the sand, it will not be mentioned. In Areas 2 and 6 the sand in each case extends for about 40 ft. Below the sand is a layer of earthy clay about 4 in. deep before the thick yellow clay is reached. (See Fig. 2.)

The three layers—earth, greysand, and earthy clay—differ markedly in their contents, each layer containing its characteristic sherds of known type, by which the shale and flint contents of each layer can be dated. Each of these layers contains its own problem and will be considered separately.

LEVEL I: EARTH

Surface to 2 ft.

After the first nearly barren 6 in. a layer very rich in sherds extends to about 1 ft. 6 in. below the surface.

The pottery is Romano-British (Fig. 8). Small pieces of 'haematite ware' of Early Iron Age A are occasionally found.

It is in this layer that the famous 'Kimmeridge coal-money' has been found in such profusion. Of late years it has not been seen in the enormous numbers recorded by earlier writers, and it is not possible now to collect it by the sackful from the beach at the foot of the cliff, as the old inhabitants of the village remember having done. But, after the winter rains and land-slips there are usually half-a-dozen chucks poking out from the cliff face.

Many more chucks occur in some parts of the 6 to 18 in. layer than in others, and by far the greater number are found round about a fragment of rough stone wall, the upper limit of which lies about 1 ft. below the surface. (See Fig. 2.)

In the same layer as the chucks are numerous

small flints, shaped to a special pattern (Pl. i and Fig. 3). The usual size is about $1\frac{1}{2}$ in. by $\frac{1}{2}$ in. by $\frac{1}{2}$ in. In longitudinal section they are triangular, with a long upper surface and two shorter lower surfaces; the shorter sides of the upper surface form sharp cutting edges. One end, instead of forming a cutting edge, may be pointed. Near the centre of the upper surface, on each side, is usually a small notch. The notches probably indicate hafting. On the other hand, if the flint is held between the thumb and first finger with the nails in the notches, and the second finger pressed against the posterior inferior surface, a very firm grip is obtained.

These little flints are far more numerous than the chucks in about the proportion of 5 to 1. They are found in varying numbers in most parts of the 6 to 18 in. layer, and their number varies directly with that of the chucks. They are absent where no chucks are found. They often occur in groups of 3 or 4 and are sometimes found in earth, down to 2 ft. below the surface.

Large numbers of broken and imperfect flints of the same pattern occur, especially in Area 6. The flints appear to be limited to the 240 yards of the site. They have not been found, at present, in the cliffs of the rest of the bay, nor in those of neighbouring bays.

The evidence in favour of the flints having been tools used in turning the shale during Romano-British times may be stated as follows :—

1. The flints are artifacts.
2. They are limited to the Romano-British layer.
3. There is a very close association between the chucks and the flints. They are found in the same layer and their numbers increase and decrease together.
4. Large numbers occur made after one pattern.
5. The flints are well suited to be used as chisels for cutting the shale while it is turning on the lathe.

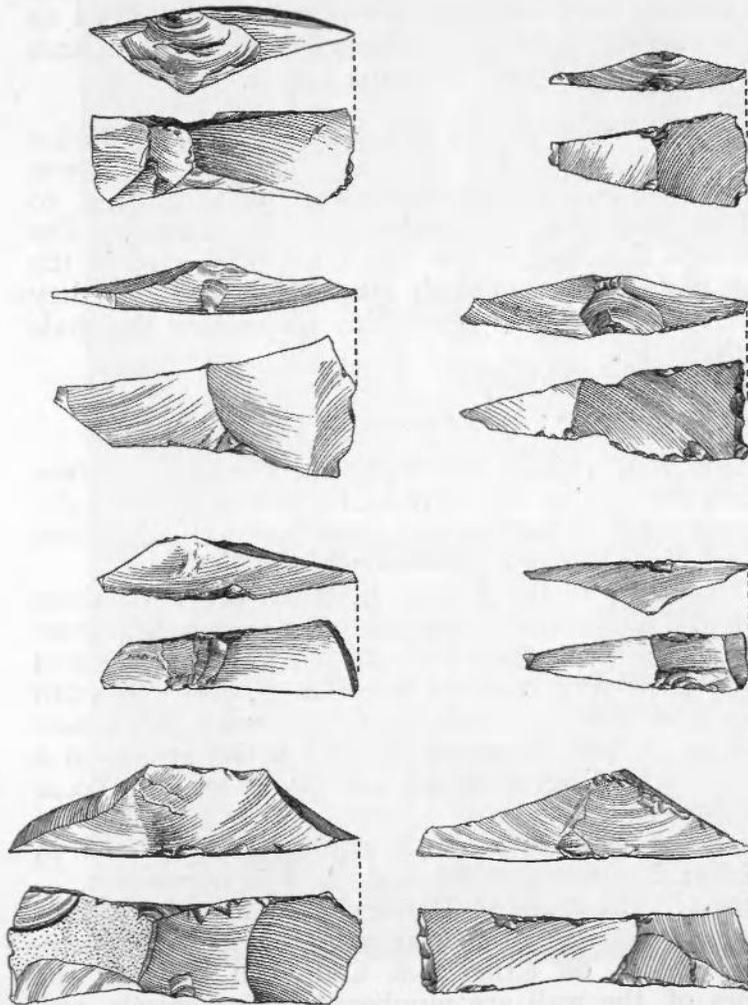


FIG. 3. FLINT CHISELS FROM THE ROMANO-BRITISH LAYER (†)

6. They have not, so far as I know, been found beyond the limits of the 240 yard site.
7. The shale-turning industry, as indicated by the association of shale chucks, shale chips and broken turned shale objects, has not been described as occurring elsewhere, although chucks are found, as isolated objects, in many places.

There is thus on this site a unique industry and a unique tool, appearing together, neither having been described as occurring elsewhere. It is difficult to believe that the association can be casual. The inference therefore is that the flints were used in the shale industry; and their shape suggests that they were used as chisels, presumably for cutting the shale on the lathe.

LEVEL I A: ROMANO-BRITISH WORKSHOP

The flint chisels are found in varying numbers almost throughout to 6 to 18 in. layer, and, occasionally down to 2 ft. But in one place in particular they are far more plentiful than anywhere else.

In Area 6 in the first 22 ft. (from the west) there were 99 flint chisels (not counting many imperfect tools or broken halves) and about 23 chucks, some of which were very incomplete. The majority of both flints and chucks came from the near neighbourhood of a low fragment of wall which stands in a sandy earth (Fig. 2, layer 1a) that does not occur elsewhere.

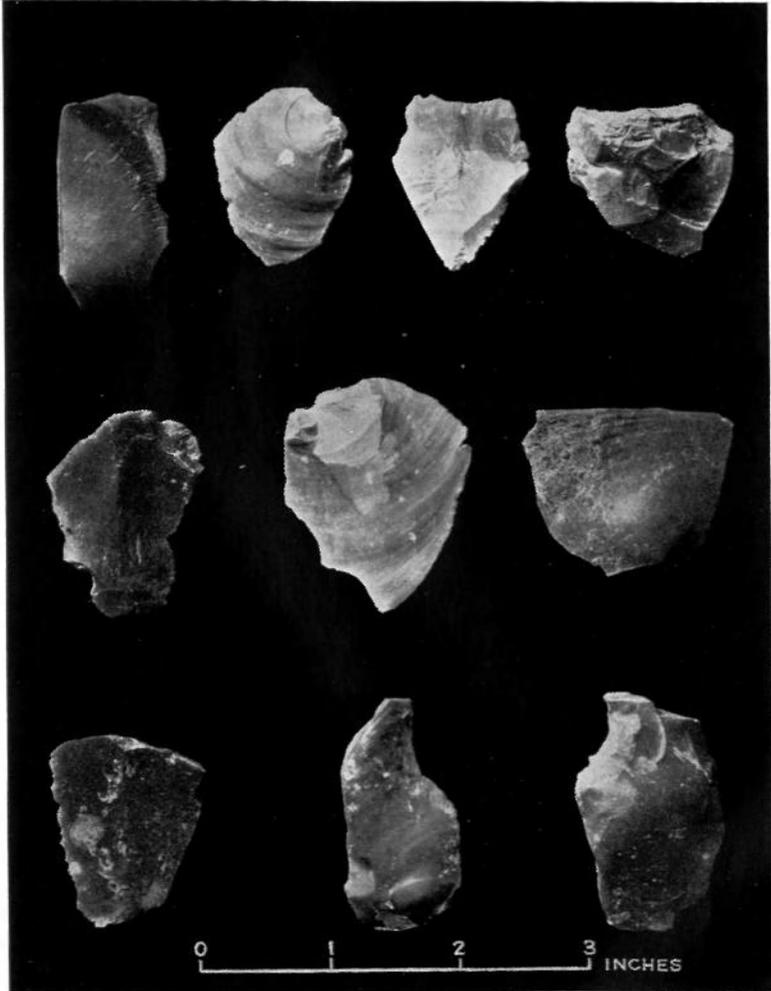
The stones of the wall are carefully placed in position, but not dressed, and there is no mortar.

Above the wall lie Romano-British sherds, shale chips, and chucks in greater numbers than elsewhere, while above, on either side and even between the stones of the wall are numbers of flint chisels, and also many broken in half or imperfect.

It seems probable that this is the remains of one of the workshops of the time of the Roman occupation, in which were turned the armllets and rings of Kimmeridge shale found in distant parts of the country.



FLINT CHISELS, SHALE CHUCKS AND FRAGMENTS OF SHALE BRACELETS
FROM THE ROMANO-BRITISH LAYER



FLINT FLAKES FROM THE EARLY IRON AGE 'A' LAYER

LEVEL II: GREY SAND

Three of the seven areas possess a layer of sand. Of these only Areas 2 and 6 will be described, as the lower layers of Area 4 have not yet been sufficiently investigated, owing to difficulties of approach. A hearth can be seen running across the lower part of the sand.

Area 6

The length of this patch of sand is about 40 ft., and cannot be more than 47 ft. The usual depth is 18 in. The west end merges suddenly into the earth. The east end is still covered.

Over part of the sand lies the lathe workshop described above, but no chucks and no chisels appear in the sand. A hearth about an inch thick runs across the upper part of the sand for $3\frac{1}{2}$ ft. A second and a third hearth lie at deeper levels, the lowest being 2 in. above the clay. The two lower hearths, in part, lie under the one above. In the two lower ones the charcoal is discontinuous.

The sand in this area appears to be almost empty, and except for a few small bones and very few, very small sherds nothing was found; but practically no sand was moved as it was important not to undercut the wall above.

Light is thrown on the probable age of this occupation by investigating the corresponding levels in Area 2.

Area 2

Two feet of earth lie above this patch of sand, and contain numerous Romano-British sherds similar to those in all other parts of the same level. But chucks and chisels are very poorly represented, only 4 chisels and 1 chuck being found. The sand measures about 39 ft. in length, the usual depth being from 12 to 16 in. The west end merges suddenly into the earth,

the east end slopes gradually from the clay. The junction between sand and earth is abrupt.

Three floors of hard beaten sand, each forming a layer almost like mortar, run across the sand. The top floor lies at the junction of the earth and sand, at 2 ft. from the surface, and can only be traced for 3 ft. Five inches lower, and partly below the top floor is the second floor, which runs on for 10 ft., a scattered layer of charcoal lies under it. The bottom floor lies 6 in. lower, about 3 ft. from the surface and is entirely under the second floor, it extends for 4 ft.

Two types of pottery are found in the sand of Area 2.

(1) Early Iron Age A. Sherds of this age are present in the sand from top to bottom, but are most plentiful in the middle regions. 'Haematite ware' forms a large part of these sherds.

(2) Coarse pinkish sherds of a specialised form, to be described later. These are present in very large quantities, especially between, and in, the top and second floors. They spread up into the lower 2 or 3 in. of earth and down to within 3 or 4 in. of the clay, in decreasing numbers. Occasional pieces are found at similar levels throughout the whole 240 yards of the site. The coarse pinkish sherds measure about 4 in. by 3 in. (Fig. 7). The longer side straight with a smoothed flat edge. The shorter side curved with a rounded edge, forming a small curved tile-like object. Not as numerous as the 'tiles' are half-bases, filling up one end of the 'tile.' Unfortunately, neither a 'tile' nor a 'base' has been found unbroken. They are definitely associated with Early Iron Age A pottery, and not with Romano-British sherds. They occur in such overwhelming numbers between the top and second floors as to suggest that they were made near by. None shows signs of having been put to any use. I have no suggestion to offer as to their function. They are too small for roof tiles or gutters, and as such would be out of place in an Early Iron Age environment.

LEVEL III: EARTHY CLAY (I.E. OCCUPATION-LAYER
OVER NATURAL CLAY)

About 3 or 4 in. above the thick yellow clay, in a mixture of clay and earth, a change takes place in the character of the sherds. They become less numerous, haematite ware is practically absent and the pottery as a whole becomes simpler.

Not one of the sherds has the texture or appearance of Bronze Age pottery, but one (Fig. 4, 1) shows Bronze Age influence in its decoration. Very little pottery is found deeper than 1 in. in the clay, a single sherd of pale brown with white shell in it lay 6 in. deep in undisturbed clay. Bones of domestic animals are plentiful and there are bone pins, gouges, and one bone scraper.

This shallow layer of only 3 or 4 in. has a character of its own, and suggests an occupation considerably earlier, or more primitive, than that of the sand above, and not merging into it.

In the 4 or 5 in. above the natural clay throughout the whole 240 yard site, it is common to find flint flakes, usually a few inches, sometimes several feet, apart, in a well-defined layer. In two places, Areas 2 and 6, the flint flakes occur in larger numbers. In Area 2 they form a continuous layer occasionally two deep. In Area 6 (Fig. 2) they are 7 or 8 deep, occupying a depth of $4\frac{1}{2}$ in. at their most abundant, and tailing gradually off over a distance of about 10 ft.

The flint flakes (Pl. ii) show bulbs of percussion. A hammer stone was found half in the clay in Area 2.

Hand-worked Shale (see Pl. iii).

Among the flint flakes are broken pieces of worked shale in large numbers. Thirty-eight pieces were lying in an area of 4 ft. by 8 in. by 4 in. Between the flints and the worked shale lay a mass of shale chips and flint chips mixed with a little earth. A few sherds of pale brown ware containing white shell and a bone pin were also in the flint bed.

The shale objects were in no case lathe-turned. They show rough tool-marks and are, in the majority of cases, broken segments of circles from 3 to 4 in. in diameter in all stages of completion.

Only one complete circle of this size was present, and one of an inch diameter. The latter unfortunately was not seen in position as it was not recognised until it had been disturbed.

Only in Area 6 was found the combination of large quantities of flint flakes, numerous pieces of hand-worked shale, and innumerable shale and flint chips, the whole forming a solid floor upon the clay, rising to a height of $4\frac{1}{2}$ in. and sloping, steeply on one side and gradually on the other, to the clay.

The appearance vividly suggests that here sat a worker, cutting the shale with sharp flint flakes, throwing down the pieces which he broke, and the flint flakes as they blunted and striking off fresh flakes as he needed them.

SUMMARY AND CONCLUSIONS

The Early Iron Age men in Kimmeridge Bay found the site unoccupied, for there are no signs of Bronze Age occupation.

Settling, with their domestic animals, on what are now the cliff-fields, they apparently began to work the shale at once. This is suggested from the position of the hand-worked shale on, and often partly in, the clay, and from the fact that no occupation-layer lies at a level below that of the hand-cut shale.

It would be surprising if a new industry had been produced so rapidly by strangers to the neighbourhood, and it is more likely that, having already evolved the method and obtained a market for their wares, the shale-workers moved to the present site to be near the main supplies of shale. Be that as it may, a workshop was set up by Early Iron Age man, the shale being cut with sharp, unworked, flint flakes which were struck off the flint nodules for the purpose. Shale circles about 4 in. across and loom weights were the chief products. After a time of great activity there



HAND-CUT SHALE, EARLY IRON AGE 'A'

was apparently a lapse on this site, for there are no signs of the shale industry being carried on during the later part of the Early Iron Age, nor until Roman influence was well marked. But it must be remembered that these notes are based on the examination of the cliff-face and about a foot behind it, an area absurd in its smallness, and are very likely to be misleading when negative conclusions are drawn. It is most likely that more work will show that the shale industry was carried on continuously from the beginning of the Early Iron Age to the Roman period.

When the Romano-British layer (6 to 18 in.) below the surface is examined, no signs of the old work remain. A new technique had replaced the old. The lathe had arrived, as is shown by chucks and scraps of finely turned shale bracelets.

The tool used in cutting the shale on the lathe was a small flint chisel of a pattern unknown elsewhere, and well adapted for its purpose. The chisels are found in large numbers, closely associated with the chucks.

As in the case of the earlier industry, there is one area which can be identified as a workshop, a small piece of the wall of which is still standing covered by a foot or more of earth.

The Romano-British workshop lies partially over that of the Early Iron Age.

It is to be hoped that this unique site, where, as perhaps nowhere else, the ancient shale industries can be studied, will be scientifically explored before it is lost by landslip or development.

My sincere thanks are due to Major Mansel, upon whose ground this investigation was carried out; to the Rev. J. Watson who, many years ago, pointed out to me the association of the chucks and the flint tools; and to Mr. G. C. Dunning, F.S.A., for help with the pottery.

THE POTTERY

FIG. 4

Early Iron Age 'A' pottery from the oldest occupied level (earthy clay, level 3), that is the 3 or 4 in. above the undisturbed yellow clay which lies about 4 ft. from the surface. In this layer lies the Flint 'Bed.'

1. A coarse purplish grey sherd with a band of 'finger tip' ornamentation on a raised moulding.
2. A fragment of rough black ware with a row of small 'finger tip' impressions.
3. Rim fragment, and sharply angular shoulder of black ware. Outside patchy red and black. Inside and core black.
4. Coarse sherd with flat rim. Outside and inside grey to brown. Core grey.

FIG. 5

Early Iron Age 'A' pottery from level 2 (grey sand), depth 2 ft. to 4 ft.

5. Fragment of coarse black ware with 'finger tip' impressions.
6. Finely made sherd of grey, haematite-covered ware, with a sharply angular shoulder, ornamented with narrow punch marks. Outside dark crimson with some polish. Inside dull red. Core grey.
7. A delicately made sherd with slightly beaded rim. Haematite-covered outside. Inside brown and black. Core grey.
8. Rim fragment of fine grey ware. Outside haematite-covered.
9. Sherd with slightly everted rim. Outside pinkish to black. Inside red. Core grey.
10. Fragment of thick grey ware coated on the outside with beautifully brilliant haematite, having a slight glaze. Inside grey.
11. Quarter of a base of fine grey haematite-coated ware. Inside brown.
12. Two sherds with sharply angular shoulder. Outside bright red with slight polish, inside and core red.
13. Quarter of a heavy base of grey ware. Haematite-covered outside. Black inside.

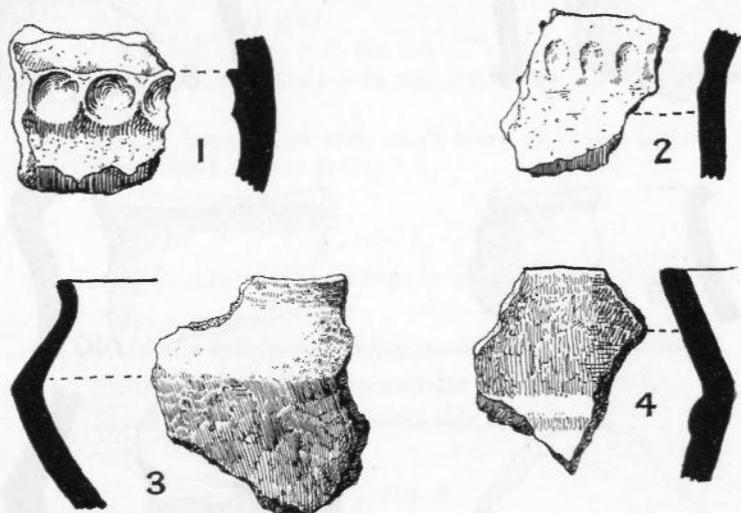


FIG. 4 ($\frac{1}{2}$)

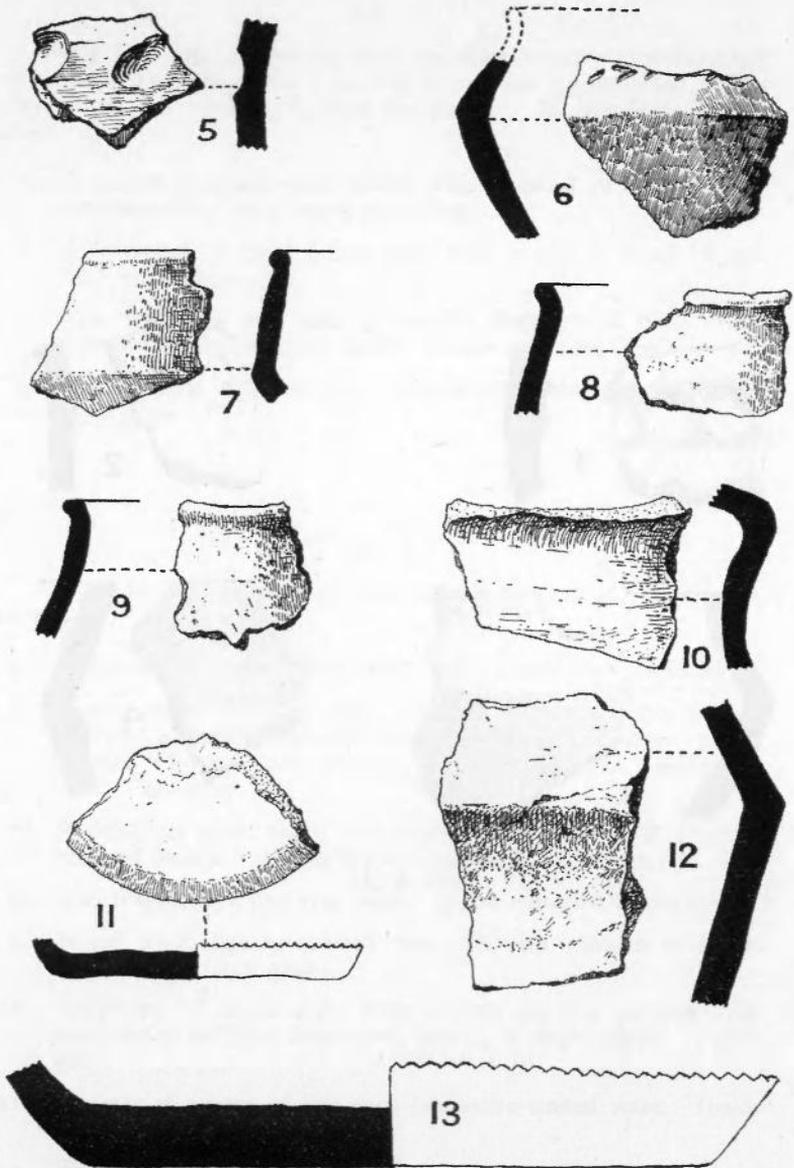


FIG. 5 ($\frac{1}{2}$)

FIG. 6

Early Iron Age 'A' pottery from the grey sand (level 2), continued.

14. Coarse grey sherd with flat rim. Outside yellow-brown.
15. Rim fragment. Outside black and dark red, polished and slightly ridged. Inside black.
16. Small part of rim of fine grey ware with incised pattern of curved line and oval punch marks. M. E. Cunnington, *All Cannings Cross*, Pl. 48 and p. 185. The incised lines in the All Cannings Cross pottery differ from those on the Kimmeridge sherd in being straight.
17. Coarse sherd of patchy pinkish-brown ware with rim and shoulder. Core grey.
18. Two small sherds with flat rim. Pink inside, outside and core.
19. Roughly made sherd with flat rim. Pink inside, outside and core.
20. Part of large vessel with small piece of base. Outside pink. Inside black. Core grey.

FIG. 7

Coarse pinkish sherds referred to on page 210. From the grey sand.

21. Piece of a half base showing smooth, unbroken surfaces.
22. Sherd showing unbroken surfaces at side and end.
23. Sherd with part of the smooth side unbroken.

FIG. 8

Romano-British pottery from layers 1 and 1A, i.e. in earth from surface to the level of the grey sand. Usual depth about 2 ft.

24. Sherd of fine texture with flanged rim. Outside pink. Inside black. Core grey.
25. A flanged rim fragment of fine black ware.
26. A rim fragment with wide flange. Outside black, inside black. Core grey.
27. Fragment of polished black ware with everted rolled rim.
28. Very slightly curved sherd with 'lattice' pattern. Outside pink to black. Inside black. Core grey.
29. Part of dish of fine black ware, with rim and commencement of base.
30. Small piece of Samian ware with part of base and foot. Core very pale.

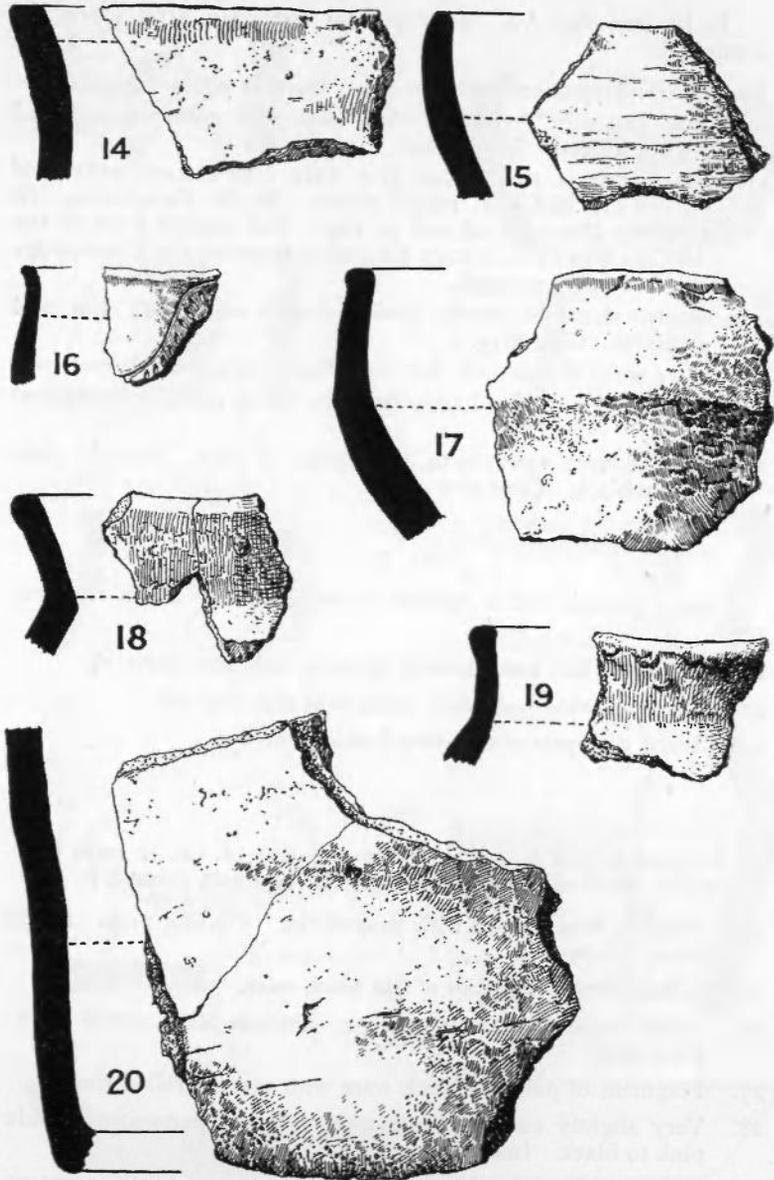


FIG. 6 ($\frac{1}{2}$)

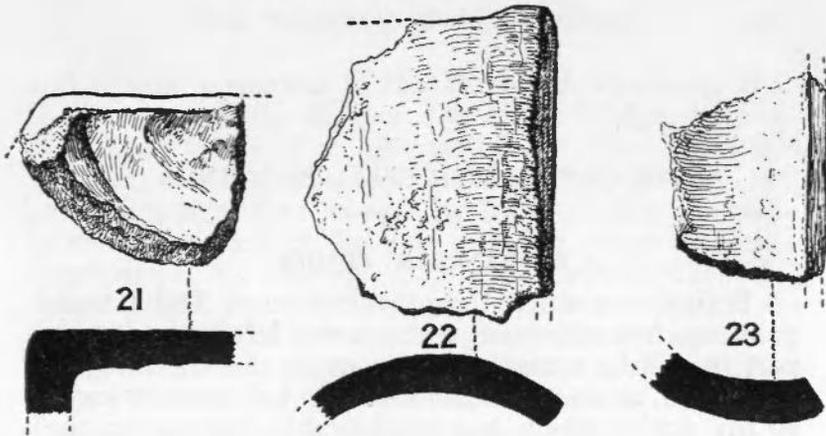


FIG. 7 ($\frac{1}{2}$)

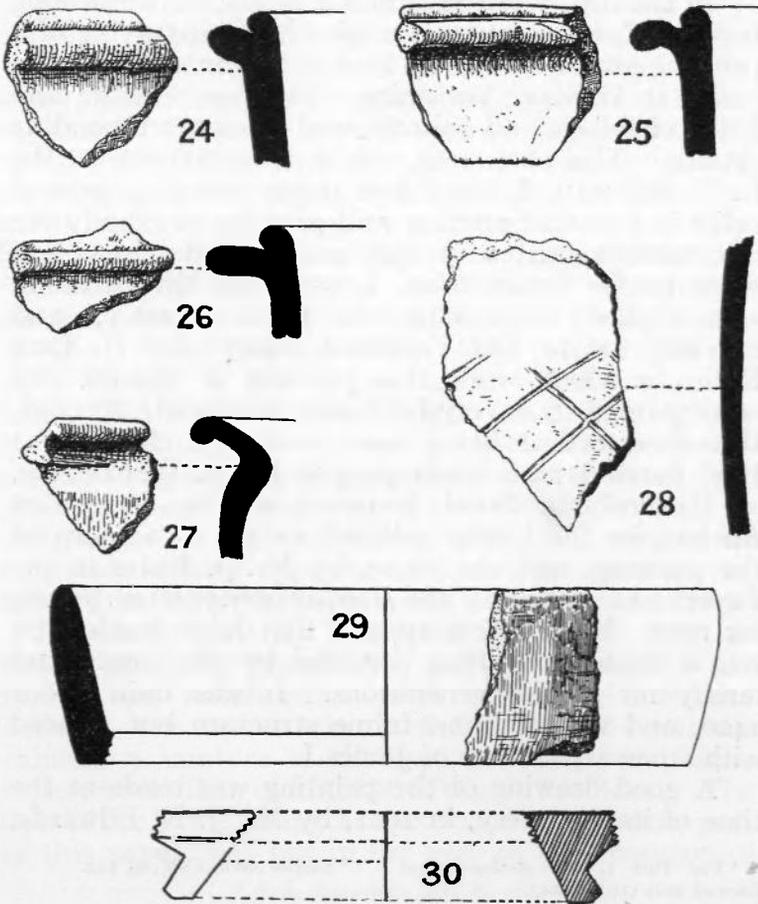


FIG. 8 ($\frac{1}{2}$)