THE TECHNIQUE OF BUCCHERO WARE

(Tavv. XX-XXIII)

In the considerable literature on the technique of bucchero ware, attention has been focused chiefly on the problem of how the black body was produced. Recent researches (1) have shown conclusively that this could be obtained simply by reduction in the firing — that is, by using smoky heat instead of smokeless heat — whereby the red ferric oxide in the clay is turned into black ferrous oxide (2). To demonstrate the correctness of this theory we need only fire red clay under reducing conditions, when it will approximate the bucchero ware in appearance (3); or fire the bucchero ware under oxidizing conditions when it will turn red (4).

The object of this paper, therefore, is not to take up again a problem which has been satisfactorily solved, but to discuss another aspect of the technique of bucchero ware — how the late variety, the bucchero pesante, was made. This process has received scant attention, though it is in fact more remarkable than the simple process of turning red clay into black terracotta.

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(1) Cf. especially FORSDYKE, *JHS*, XXXIV 1914, p. 1393; MACIVER, *Man*, XXI, 1921, June, pp. 86-88; RICHTER, *Craft of Athenian Pottery*, p. 45 and *Bulletin of the Metropolitan Museum*, XXIV, 1929, p. 142; BINNS, *AJA*, XXXIII, 1929, p. 9, pl. II, no. 6. That a black body can be produced also by other means — for istance, by the addition of manganese — has been shown by DEL VITA, *St. Etr.*, I, 1927, pp. 192. It would seem likely, however, that the simplest method was used.

(2) The chemical explanation of this phenomenon is that in an oxidizing fire, where there is an excess of air or oxygen, the carbon of the fuel can combine with two atoms of oxygen to form carbon dioxide (CO2); in a reducing fire, on the other hand — where the air is shut off — there is a dearth of oxygen and the carbon can get only one atom of oxygen, forming carbon monoxide (CO); carbon monoxide will then extract oxygen from the red ferric oxide ($Fe_2 O_3$) in the clay and convert it into black ferrous oxide, changing the red clay into black terracotta ($CO + Fe_2 O_3 = CO_2 + 2 Fe O$)

(3) Cf. the example shown in the room of technical exhibits (Gallery K103) in the Metropolitan Museum (*Bulletin*, XXIV, 1929, p. 142).

(4) Cf. the convincing experiment by BINNS, *loc. cit.*

The current analysis of the technique of this ware is that it is wheel-thrown — like the earlier bucchero — and that the reliefs were made in separate moulds and then applied on the body before firing (1). After carefully examining a number of vases, however, this explanation did not seem to me convincing; at least it seemed to apply only to those vases where the reliefs — or heads in the round — protrude above the rims etc. (Pl. XX, 4) and to the relatively few vases where the reliefs, though placed against the sides, still have the appearance of being separate units (Pl. XX, 1) (animals on cover), 5 (medallions). In the bulk of the ware the reliefs which decorate the sides of the body, foot, or neck appear to be part and parcel of the vase, not separately applied. Their contours are dull, so they must have been moulded, not carved directly in the clay; but on the insides of the vases are wheel marks.

Puzzled by this seeming contradiction I presented the problem to a professional potter, Miss Maude Robinson of New York, and examined with her the fortunately extensive collection of bucchero in the Metropolitan Museum. She was able to solve the

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(1) Martha, p. 473 : « Ces figures, estampées à l'avance à l'aide de moules en forme de cachet, qui permettaient d'en tirer d'innombrables épreuves, ils les appliquaient sur la surface encore fraîche de l'argile, après y avoir préalablement étendu une couche de barbotine... » ; Pottier, *Catalogue*, II, p. 316 : « le relief... se compose d'une serie de médaillons et de petits basreliefs, modelés à part ou tirés d'un moule. qui sont appliqués par barbotine sur le vase » ; Dar. Sag., *Vasa*, p. 659 : « Reliefs obtenus... au moyen d'une applique exécutée à part, poussée dans une matrice et collée ensuite sur la panse ou sur le col avec un peu de barbotine » ; Walters, *History of Ancient Pottery*, I, p. 302 : « Series of medallions separately modelled or made from moulds and stuck on » ; p. 303 : « The figures and ornaments are stamped in from moulds and fixed by some adhesive medium » ; Karo, *Ath. Mitt.*, XLV, 1920, p. 149 : « Und die grosse Masse der schweren Buccherogefässe mit aus flachen Stempeln aufgepressten Reliefs » ; Ducati, *E. A.*, II, p. 80 : « Bucchero a decorazione a rilievo applicato, desunto da stampi » ; Ducati, *A. E.*, p. 296 : « lastre a rilievo ottenute mediante matrici ed applicate sulle pareti dei recipienti » ; Poulsen, *Das Helbig Museum der Ny Carlsberg Glyptothek*, p. 41 : « Die Reliefs... werden in hohlen Tonformen verfertigt und danach einzeln auf die Oberfläche der Vase geklebt, bevor der Ton trocken ist, wonach man mit einem Modellierholz die Fugen entfernt » ; Levi, *Il Museo Civico di Chiusi*, p. 107 : « decorazioni... applicate mediante matrici sul corpo dei vasi » ; Forsdyke, (*Encyclopaedia Britannica*, 14th ed. *Pottery and Porcelain*, p. 343) recognized the ware as moulded but not as moulded on the wheel : « The fabric is generally heavy, since most of the vases were made in moulds and the wheel was rarely used ».

problem by making two important observations: (a) Though there are wheel marks on the inside of the vases there are none on the outside. (b) Corresponding to the reliefs on the outside are depressions on the inside with the potter's fingerprints (Pl. XXI-XXII), which could only have been produced by pressing the clay into the depressions of a mould. If the relief had been separately applied, instead of a depression we should expect, if any indication at all on the inside, the reverse condition, that is, a bulge caused by the pressure from the outside on the clay at that point. Such bulges do appear in the few cases where the reliefs were separately added.

It is clear from these two observations that the bucchero vases in question were made in moulds — not cast or pressed — but thrown on a jigger (1) — that is, on a wheel with a revolving head on which a mould could be fitted. The moulds were probably of terracotta, for terracotta rather than plaster was the material currently used for moulds in the ancient world. We might expect therefore that at least some of these moulds would have been preserved, for terracotta is a material difficult to destroy. Their apparent absence is, however, easily explained by the fact that most Etruscan antiquities have been found in tombs and temples, and potter's outfits are not likely to be buried or dedicated.

Fortunately exactly the same technique as that of this later bucchero is observable in the Megarian, Arretine, and terra sigillata ware (2), except that there the depressions on the insides of the vases have been filled in, presumably because in cups and bowls smooth interiors are preferred; moreover, as the decoration in these wares is in very low relief, the depressions could be easily filled in, and it was all the more desirable to do so since a higher finish was aimed at than in the rather bold bucchero pots. Since many moulds and stamps used in this Hellenistic and Roman ware have been preserved, they can help us to visualize the various processes in the making of a bucchero vase: the throwing of the mould on the wheel, the impressing of the stamps in the mould, the spinning of the vase in the revolving mould, the attachment of handles and feet. In fashioning the vase the clay would first be placed inside

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(1) This method is in common use nowadays for the manufacture of dishes, platters, bowls, where, however, a jolley — with cutting profiles — is also used; cf. the chapter on « Jigger and Jolley Work » in Cox's, *Pottery*, pp. 51 ff.

(2) Cf. Walters, *History of Ancient Pottery*, II, p. 438; Thompson, *Hesperia*, IV, 1934, p. 452.

the mould — after the latter had been firmly fitted on the wheel — then the wheel would revolve and the clay be spun against the sides of the mould until it reached the outer edge, and finally the wheel would be stopped and the fingers pressed into the hollows of the decoration. (Pl. XX, 2 shows clearly the marks of the fingers which pressed the clay into the hollows going *over* the marks which were produced while the clay was rotating). While the clay was still leatherhard the reliefs were gone over with an engraving tool to add details and complete the forms.

The Megarian and Arretine vases consist largely of open bowls for which one mould was sufficient; but in bucchero pottery,

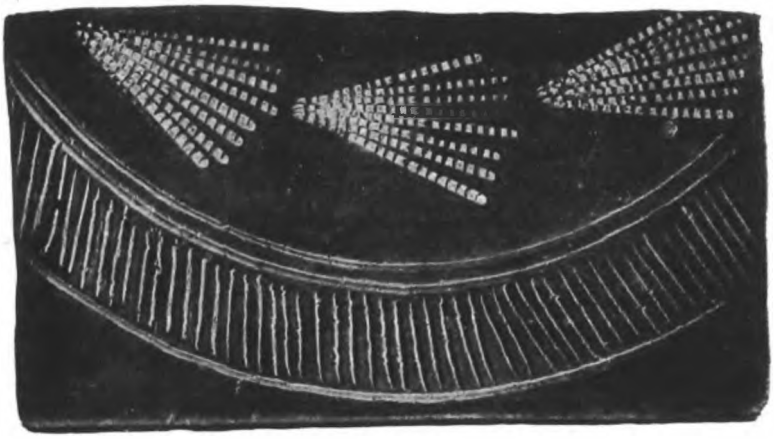

Fig. 1 — Fan-shaphed decoration on vase illustrated in the pl. XXIII copied in modern studio using toothed stick

where jugs and other vessels with upper parts incurving are frequent, and where there are elaborate supports and feet, more than one mould will have been required. When the various sections were completed they were assembled horizontally in the same way as were those of the large, thrown Athenian vases (1). The foot was sometimes thrown, sometimes moulded (Pl. XXI, 1). The joints where foot and body, neck and body, or different parts of the body were attached can often be detected.

We have then a variety of techniques in bucchero. (a) The earlier ware — bucchero sottile — is thrown and turned and has incised decorations produced either by a pointed instrument which formed a continuous line, or by a toothed tool which produced a

(1) Cf. Richter, *The Craft of Athenian Pottery*, pp. 15 ff.

series of scratched dots (1) (Pl. XXIII). (b) The ware with narrow friezes in low relief is thrown, the reliefs being produced by means of cylinders which were rolled along the surfaces of the vases while the caly was still soft (2). (c) The later ware — bucchero pesante — is occasionally thrown — when there is no relief decoration (Pl. XX, 3), or sometimes (3) when the reliefs have been separately applied, but mostly it is made in moulds on the wheel.

It is interesting to find that the Italian Arretine and terra sigillata merely revived a technique practised in Italy centuries before.

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(1) The tool which produced these marks is referred to by some authorities as a « toothed wheel »; but experiments (made in Miss Robinson's studio) show that a simple toothed stick will make just such engraved dots as occur on the bucchero vases (fig. 1), while a toothed wheel produces too regular impressions.

(2) Cfr. MARTHA, POTTIER, WALTERS, POULSEN, *op. cit.*

(3) Even when the reliefs were added later the vases were often made in moulds (pl. XX, 5) where, though the medallions were added separately, there are interior depressions for the horizontal bands — indicating a moulded technique.

1

2

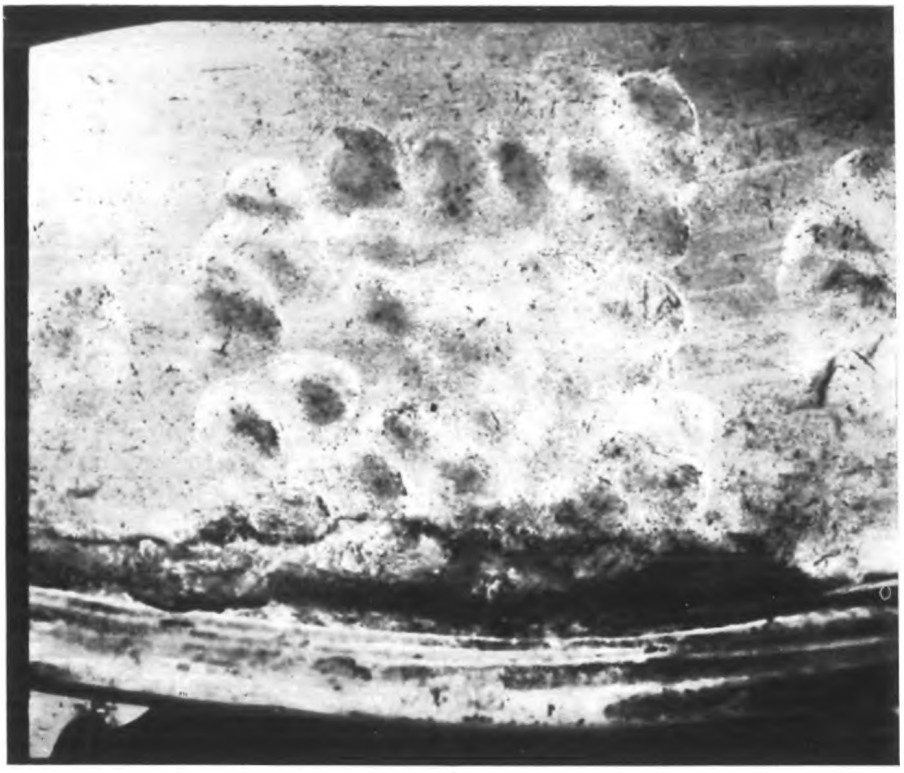
3

4

5

NEW-YORK - METROPOLITAN MUSEUM - 1. Detail of bucchero vase with animals separately attached 2. Inside of a fragment of a bucchero vase showing depressions (made by pressing fingers into hollows of mould) going over wheel marks — 3. Bucchero cup wheel-thrown — 4. Bucchero jug with heads and medallions separately attached — 5. Bucchero vase with medallions separately attached

1



2

NEW-YORK - METROPOLITAN MUSEUM - 1. Bucchero vase thrown in a mould 2. Detail of inside of vase showing depressions with potter's finger prints

1

2

NEW-YORK - METROPOLITAN MUSEUM – 1. Bucchero vase thrown in a mould
2. Detail of inside of vase showing depressions corresponding to relief of swan on outside

NEW-YORK - METROPOLITAN MUSEUM - Bucchero jug with incised decoration and fan-shaped ornaments on shoulder - Wheel-thrown