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STONE ANCHORS : THE NEED FOR METHODICAL RECORDING

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The archaeological significance of early anchors as clues to ancient vessels and sea-lanes is discussed.

The use of this kind of evidence does, however, depend on making adequate typological records.

Key Words : *Stone anchors, Typology.*

Stone anchors excavated in temples and tombs in the Mediterranean, and in the East those found in medieval mosques, because they can be matched with examples found undersea, are becoming recognised as a rich source of information about the period, size and sea routes of the ships to which they once belonged. Each anchor found undersea represents the passage of a vessel, hence its potential as a clue to that vessel's size and provenance. Furthermore, when a given region produces quantities of early stone anchors, these represent collective evidence for filling the gap in our knowledge of ancient fleets (this because wreck excavation is inevitably rare) while imports excavated on land give no clue to the "nationality" of the ships that imported them.

Extracting information from stone anchors will, however, be like "getting blood from a stone", unless reliable typologies have been established, and establishing them is not simple. Anchors do not share the basic standardised criteria applicable to artefacts such as amphorae. What makes anchor classification complex, is that the emphasis placed on any one factor may have to vary from one sea to another and one region to the next. For instance : in those parts of the Levant where anchors found undersea can be matched with specimens form land excavations, the problem is fairly straightforward. But in regions where anchors nave only been found undersea, or where for geological reasons the location of the Bronze Age coastline is itself unknown (as on the Black Sea shores), classification depends on the statistical analysis of the shared characteristics which show the anchors themselves to fall into more than one group. Examples of such problems need to be examined, for without agreed solutions, "anchorology" like some newly opened "Pandora's Box", will let out a dangerous flow of speculation and misinformation. The Indian context cannot be immune to this danger, for pierced stones of considerable size and weight are beginning to be located and identified as anchors.

Pierced-stones-which all tend to look alike in photographs-can certainly be confusing; for besides serving purposes on land, they are still used throughout the world's waterways for sinking such things as fishing-tackle and for immobilising a variety of floating objects as well as vessels of all sizes. Thus, it is easy for nonseamen, especially

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when they do not take size into account, to draw mistaken conclusions.

The only safeguard against misinterpretation is a) to accept strict archaeological criteria for recording pierced-stones; b) to build up a corpus of comparisons; c) to use methods of interpretation no less rigorous than those applied to potsherds. The typology of amphorae can, for instance, be understood from drawings of rim-sherds, because they are always drawn to a standardised and accepted convention, while the fabric of sherds is described in standardised terms.

The note on field-recording and the index card questionnaire (see below) are designed to produce a minimum of basic information in a form which could be assembled and used in the publication of a *Corpus Ancorarum*. Every detail counts : the way the hole has been pierced is significant, while lithological data is essential. As in standard descriptions of pottery, the appearance of a rock (its colour, inclusions, whether examined wet, or dry etc.) must always be described in words, even if the rock appears to be "just a common lime-or sand-stone". In the case of an exceptional anchor, or group of anchors, small samples of rock should immediately be sent for thin-sectioning and microscopic identification by an appropriate lithologist. In other cases, coin-sized samples should be filed for future reference; in this connection "future" is the operative word, for not only are laboratory methods of identification constantly being refined, but new discoveries may suddenly give meaning to a shape being coupled with a type of stone, which had previously seemed insignificant.

The single most important fact about any anchor is, however, its size and consequently its weight but surprisingly, this is seldom adequately recorded. Size and weight cannot be adequately gauged from photographs. Weight can be establishing in one of two ways : preferably, by using a weighing-machine; alternatively, by calculations which take into account both the measurements of an anchor and the specific gravity of the category of stone from which it is made. Visually, it is size rather than shape that differentiates a fisherman's line-sinker from an ancient stone anchor too heavy for one man to handle, which had therefore to be dropped by mechanical means such as a mast-derrick. Thus, weight is also a guide to the antiquity of anchors found on the sea floor, for it must be remembered that, throughout the would, small stone-anchors are still used on small craft. It follows that specimens which are light enough for one man to handle, could just as well have been lost by a modern fishing-boat as by an ancient fishing boat, whereas an anchor so heavy that to lift it would either require more than one man, or the use of a boom[1] must be ancient, since on long-distance craft stone anchors were superseded as soon as more technically efficient designs were introduced. Finally, anchor-size also has historical significance : giant anchors associated with Late Bronze Age Temples, or Islamic mosques imply that the merchant fleets or the respective periods possessed some giant ships.

Many votive anchors and many anchors lost at sea on a sandy bottom are good as new, but on anchors lost in turbulent conditions, all signs of "dressing and piercing" will have been effaced, corners will have become rounded and holes enlarged. These changes

need to be recognised and recorded. In other marine environments an anchor's original shape may have survived, although marine encrustation's mask it, as well as the surface tool-marks and the stone itself (to the extent that, when chipping off a sample, care must be taken to reach the original rock beneath its covering of concretion). Breakage also needs to be recorded, because if it goes unnoticed, this omission obviously falsifies an anchor's nature (for example, if carelessly recorded, the broken top of a three-holed anchor will appear as a one-holed anchor). As with pottery, specialists can usually deduce original shapes from fragmentary remains, nevertheless this depends on the perfect recording of a less than perfect anchor, and conveying it clearly both in drawing and in words

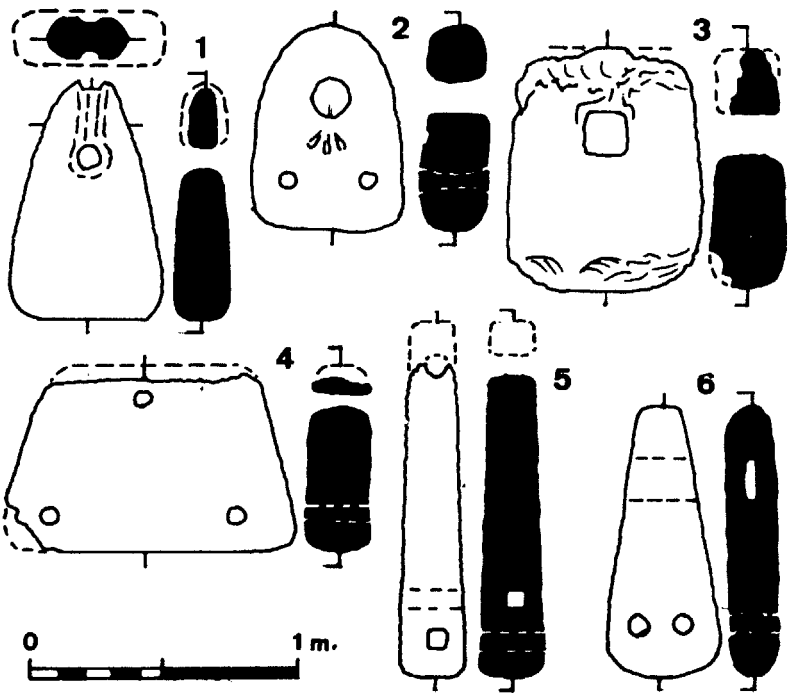

Fig.1 Some representative anchor forms

1. Byblos (Lebanon), 19th century BC.
2. Kition (Cyprus), 13th century BC.
3. Ugarit (Syria), c 13th century BC.
4. Bulgarian Black Sea anchor, pre Iron Age, (after B.Dimitrov).
5. Mogadishu (Africa), c 13th century AD.
6. Egypt, Alexandria (Egypt) late Roman, c 4th century AD.

Fig. 1 shows a few typologically significant shapes which represent "families" of anchors. Such "families" are deduced firstly, from specimens excavated *in situ*, in

contexts of known periods, either on land or undersea. Mediterranean examples include the excavated sites of Byblos, Kition ad Ugarit, which contain important groups[2]. Secondly, from anchors found in great numbers within a relatively small area where, even though individual archaeological contexts are lacking, statistical analysis yields sets of predominant shapes. In the Mediterranean and Black Seas, this applies to the short and shallow coastline of Israel and Bulgaria where, over a long period of time, diving archaeologists have consistently raised and recorded anchors. In consequence it is apparent that the Byblian shape (Fig. 1, no. 1) is common in Israel, while of the Bulgarian black sea coast the large, wide-based shape (Fig.1, no.4) emerges as indigenous, while its contexts suggest that it antedates the Iron Age. No comparable records have been kept in the Western and Central Mediterranean (including Greece) and along the North African coast. In all these areas relatively few anchors have been noted on land and, for one reason or another, underwater recording has been sporadic, the same problems also apply to the far larger areas of the Indian Ocean and the Arabian Seas.

Finally, the scope of the subject as well as the need for recording, is illustrated by the somewhat different example: no.6 on Fig.1 from Alexandria, a town which has always linked East and West, the Nile Delta being the meeting place for Mediterranean and Red Sea cultures. This form, of late Roman period (by which time stone anchors had long been oblolete in the Mediterranean) has piercings typical of the Arabian anchors which persist in the Red Sea Persian Gulf: the apical hole runs through the width of the stone and the hole, or holes, for wooden arms at the base, run in the opposite direction through its breadth. This factor, coupled with the unusual elongation of the Alexandrian shape, may herald the stone shanks of mediaeval, Islamic grapnels so common in Indian and Arabian waters.

To conclude, a *Corpus Ancorarum* is needed. The project is both long-term and multi-disciplinary and its interest goes beyond Levantine Bronze Age trade and religious symbolism. Ships know no frontiers, while anchors are by definition: "instruments designed to immobilise floating object" (even oil rigs are anchored), it therefore follows that the study of anchors has ethnographic interests in connection with fishing, as well as archaelogical relevance to shipping.

Notes on Recording Stone Anchors

1. In the Field :

MEASURE : at appropriate points, as shown in Fig.2 (if underwater, sketch then transcribe measurements later).

DRAW : make a preliminary drawing (life size of at any convenient scale).

PHOTOGRAPH :

(a) always show a centimetre *scale.*

(b) whenever possible take from back, front and side;

(c) if found unexpectedly underwater use makeshift scale: e.g. diving-knife.

SAMPLE STONE : chip off a small piece for thin-sectioning (making sure it is not just surface concretion).

Write visual description (colour, inclusions etc.), stating whether examined wet or dry.

DESCRIBE : Tool marks, Inscriptions, Signs of wear etc. giving distinguishing features: the tool used (hammer-dressed, or chisel-cut?); whether holed are bi-conic or bi-cupular in section (i.e. made by a bow-drill, with or without a stone bit, etc.). If no marks show, describe the anchor's state, whether water-worn; covered by marine growths (on one, or both sides); whether broken etc.

WEIGHT : If a stone cannot be put on a weighing-machine, calculate its weight as follows, from its measurements (taken as shown) :

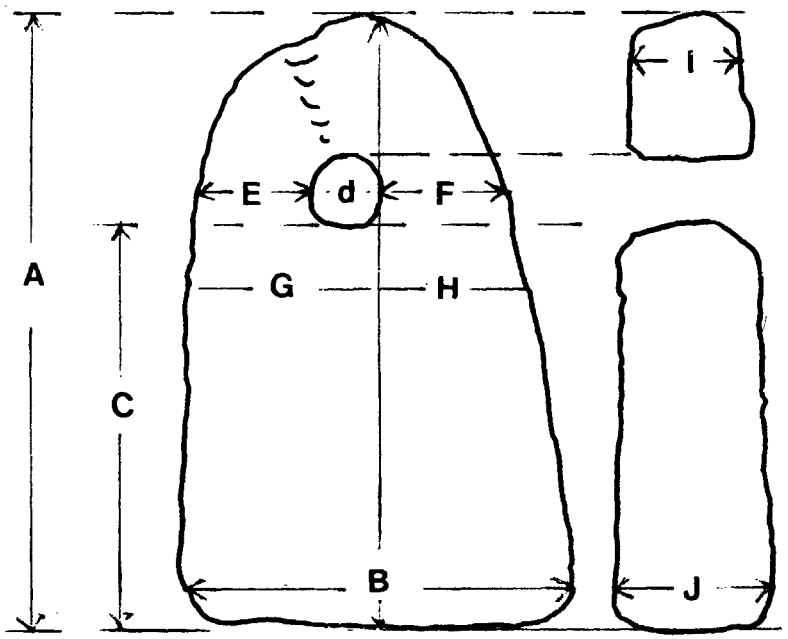

Fig. 2 Methods of Measurement

Multiply average breadth = (1/2 A+C+D+E), *by height* = B,

Subtract the round area of the piercing = 22/28 x D x D,

Multiply the average thickness = 1/2 (1+J),

Then multiply the result: the anchor's volume (in cm,), by the specific gravity of the stone in question, e.g. Limestone = 2.7 (the result will be in grammes).

N.B. The main objective being to find out whether more than one man is needed to handle an anchor, this simple calculation is adequate; should greater accuracy be needed, more complex calculations are possible. But it must be remembered that even the best made and presserved temple-anchors are neither symmetrical nor smooth. Eg. if an anchor is over a metre high and has proportions similar to those illustrated, then two careful draftsmen might produce drawings with a discrepancy in the order of three centimetres. This would be acceptable, but a discrepancy of ten centimetres would not. Perfection could be achieved by building a large measuring-machine (on the principles of those once used to measure feet in shoe shops), but this being unrealistic (in "the field", and especially underwater!) common sense must prevail. The best instrument for measuring such stones is a sculptor's callipers. Otherwise, "the perfect being the enemy of the good", measurements should be made as accurately as possible. If this is not attempted, much precious information will be lost.

2. Preparation of Index Cards :

Use the small, but standard size: 127 x 76 mm. Paste a 1:20 scale reduction (made on "Graph paper" from the original drawing) onto the top left hand corner. Leave space for eventual analysis, bibliography etc. Date entries and index under geographical, or site name.

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