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HOARDS D'OEUVRES: OF METALS & MEN ON BRONZE AGE CYPRUS

Summary. Diverse streams of archaeological and metallurgical research have demonstrated that Cyprus was an important regional copper producer and supplier during the eastern Mediterranean Bronze Age, at least from 1700–1100 BC. Until recently, research into metallurgical production and exchange on Bronze Age Cyprus necessarily focused on technological change and chronological division. Metals' provenience studies have begun to mature, and economic approaches related to copper production and exchange have begun to appear. In stark contrast to recent literature on "hoarding" activity in Bronze and Iron Age Europe, virtually no attention has been paid to the manner in which metals enter the archaeological record. In response to a growing body of theoretical literature, this study examines the gift-commodity model and finds it wanting; instead the deposition of Cypriot hoards is considered from a politico-economic perspective, and in light of socio-historical and metallurgical data relevant to interregional developments in the contemporary Mediterranean world.

INTRODUCTION

"The hoard is there because buried and never retrieved. If retrieval was never intended, then it is a cult or votive offering; if intended and yet frustrated, the hoard was a loss—which demands explaining." (C. Hawkes 1974, 115–116, emphasis in original)

"... the evidence of *hoards* is often ambiguous there is a need for middle range research if we are to relate individual hoards to the processes that brought them into being." (R. Bradley, *Man* 22 [1987] 560)

In a metals-hungry, Bronze Age world, the eastern Mediterranean island of Cyprus was an important regional copper producer and supplier. Archaeological excavations on the island over the past century (since 1888) have revealed copious and diverse evidence of copper mining and production, distribution, consumption, and deposition, as well as a wide range of related craft activities (see, e.g., Catling 1964, 1984; Matthäus 1985; Muhly, Maddin, and Karageorghis 1982; Muhly, Maddin and Wheeler

1980; Stech, Maddin and Muhly 1985).

As is the case in much research on prehistoric metal deposits in Europe and Britain (Bradley 1985a, 692), the literature on Cypriote Bronze Age metalworking and related activities has focused on establishing a secure chronology through consideration of stylistic developments or technological change, within a unilinear, culture-historical perspective; nor has such emphasis been misplaced, given the quantity, quality, and diversity of the material.

With few exceptions (e.g., Coombs 1975; Rowlands 1976), theoretical approaches related to copper production and exchange, especially to the manner in which metal enters the archaeological record, are a very recent phenomenon (Bradley 1982, 1984, 96–106, 1985a, 1985b; Gosden 1985; Morris 1986). Nor have the proponents of such an approach exactly reached consensus on the theoretical issues involved (see the exchange of “Correspondence” amongst Rowlands, Bradley, and Gosden in *Man* 21, 745–748, and *Man* 22, 558–561).

Although an attempt has been made to consider Bronze Age Cypriote copper production and exchange in its politico-ideological context (Knapp 1988a, 1986a), the issue of metals’ deposition attracted little attention prior to the recent, lengthy publication of Matthäus and Schumacher-Matthäus (1986; hereafter *Hortfunde*). That study, an extensive catalogue with detailed discussion of most relevant Cypriote material, revolves around the central thesis that all metal deposits (*Hortfunde*) on Bronze Age Cyprus (Fig. 1) have a cultic character; furthermore that they must be regarded chiefly as intentional “foundation deposits”, “building sacrifices” (*Bauopfer*), or (rarely) votive deposits, all closely related to the “religious customs” of metalworkers, craftsmen, or other associated,

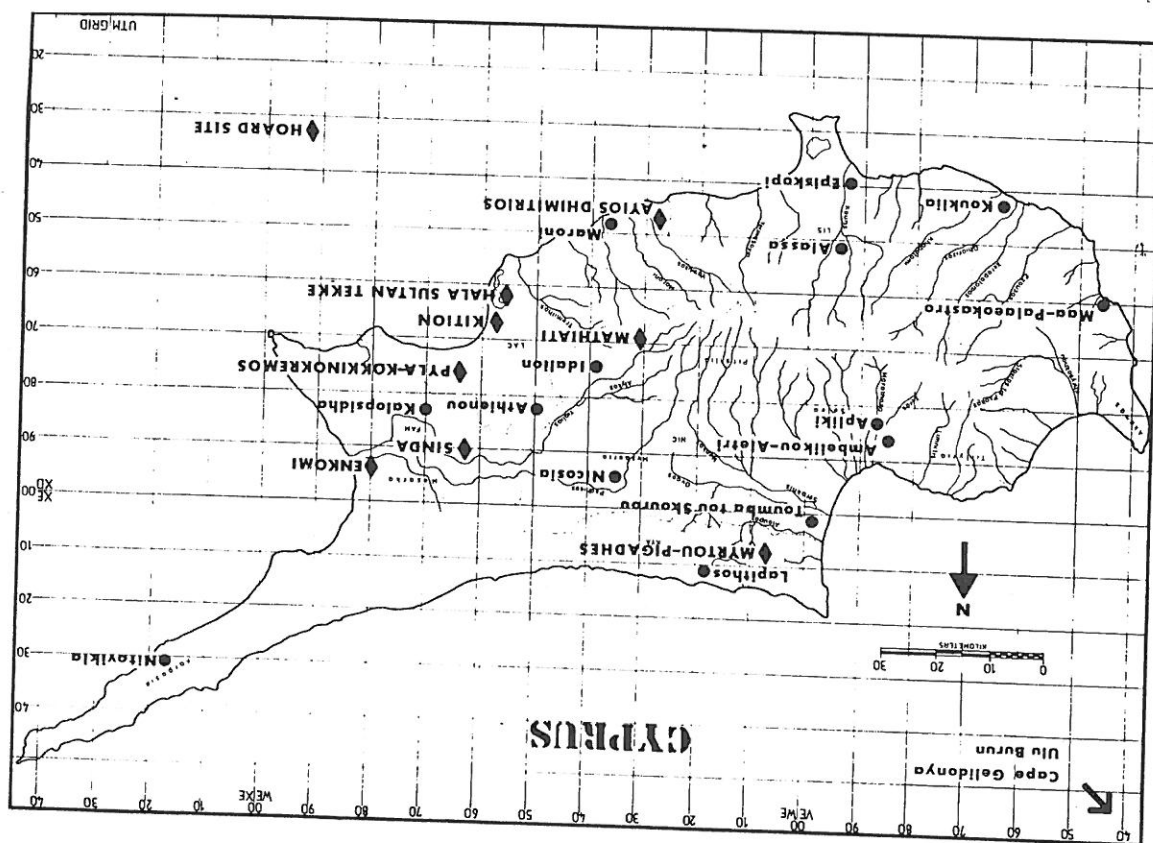
professional groups (*Hortfunde*, 166–169).

In the present study, I shall argue that the internal groupings established in *Hortfunde* are false, and that the study demonstrates how serious, methodical scholars tend to develop rather simplistic portrayals of ancient religion or ideological *praxis*. I shall propose, furthermore, that these hoards may better be discussed in economic and ideological terms, always within their archaeological context but also in light of relevant socio-cultural data that pertain to broader interregional developments in the contemporary eastern Mediterranean world (Late Bronze–Early Iron Age transition: 13th–12th centuries BC).

THE PURPOSE AND NATURE OF HOARDS

Hoarding activity has always been commonplace; Bradley goes so far as to call it one of the “fundamental processes” and “motive forces” in Bronze Age society (1985b). Archaeological distinctions—by context/location, content, or time—permit varying economic or social perspectives on the behavioural aspects of hoarding. A number of recent studies have concentrated on the deliberate deposition of wealth and the social or ideological factors that may help to explain such actions (Bradley 1985a, 1985b; Gosden 1985; Morris 1986; Parker Pearson 1984). By extension, the voluntary discarding of wealth, or of raw-scrap material destined to be transformed into wealth, assumes relevance for the understanding of change in prehistoric society (Parker Pearson 1984). Even if it is agreed to define this process as the “voluntary discarding of property”, its rationale is still twofold: economic or social. Black and white distinctions between the two, however, often merge into grey: if interrelated,

Figure 1
Cypriote Bronze Age sites mentioned in the text. Sites marked with a diamond (◆) indicate presence of buried metal deposits (drawn by Alexandra Held).



both aspects demand explanation.

To argue that all buried deposits (hoards, grave goods, votive and foundation deposits, river finds, etc.) represent variants of one underlying behavioural pattern involving deliberate discard (Bradley 1982, 108) fosters a predilection to extend to all hoards (or to all votive deposits) an interpretation that may be appropriate to only one or two. The "cultic" interpretation of *Horfunde*, or the implication that all buried deposits were made in response to social unrest, exemplify this pitfall. Such assumptions imply that Bronze Age people were forever making divine restitution or endlessly involved in conflict; furthermore, if conflict dominates your society, why hide all your weapons, or worse yet throw them in rivers (Bradley 1982, 116)?

Bradley and others find potential insight into the social context of hoards in Gregory's concept of a "gift-commodity" continuum of related forms of production, exchange, and consumption (1980, 1982, 1984). The gift-commodity "model" has its roots in economic anthropology, and Gregory's study (1982) is based in the works of Marx (*Capital* I), Mauss (1966), and Levi-Strauss (1969) (summarized in Morris 1986, 2-3).

Whereas contemporary ideological or politico-economic divisions cannot be extrapolated wholesale into prehistoric contexts, it may be useful initially to contemplate such distinctions, and to consider each archaeological case study on this level, as well as on its own merits. The distinction between social and economic, ideological and political, of course, remains notoriously difficult to recognize in prehistoric contexts.

Although the gift-commodity model obviously has potential for prehistoric research, Bradley—who has used it most

effectively and convincingly—acknowledges that it provides a purely theoretical approach to conflicting archaeological interpretations, "... and takes us a long way from the character of the specifically archaeological data" (1985a, 695). On the one hand, with ethnographic data or informant's viewpoints available, Gregory's model makes it possible to see that the same object could be involved in either a "social" or an "economic" transaction; the gift-commodity concept thus serves to break down the formalist-substantivist dichotomy in economic anthropology. On the other hand, confronted with the purely material character of the archaeological record, it seems more productive, despite Bradley's reservations (1985a, 692-963), to establish some basic divisions and definitions, and to characterize individual hoards in terms of context, content, and condition.

In distinguishing between utilitarian and non-utilitarian buried deposits, or what are commonly termed in the archaeological literature, respectively, "merchant's/founder's hoards" and "votive deposits", it may be useful to keep the following formulae in mind:

Commodity:: (Formalist): production & exchange: economic
Gift:: (Substantivist): consumption & exchange: social

Definitions and Archaeological Recognition

Like metal deposits in archaeological contexts worldwide, Cypriote deposits identified as "hoards" contain a wide range of material, from the exquisite to the inappreciable. Some reflect metals' production, others craft production. Some represent deliberate activity, others surely indicate more random behaviour. Factors of resource acquisition as well as production—especially production beyond subsistence

TABLE 1
UTILITARIAN AND NON-UTILITARIAN BURIED METAL DEPOSITS: ASPECTS OF CONTENT, CONTEXT, AND TIME

TABLE 1

UTILITARIAN		NON-UTILITARIAN	
Production/Exchange		Consumption/Exchange	
Organisation of Metalworking		Social Position & Prestige	
CONTENT	CONTEXT	CONTENT	CONTEXT
'Primary Refuge' Objects	'De Facto Refuge' [M.B. Schiffer] Objects	'non-specialised' fragmentary/intact newly-made (occasionally identical) standardised	'specialised/unique' 'destroyed'/intact newly-made
Merchant's Hoards	Votive Deposits		
Objects	Objects		
intact	intact		
newly-made/multiples	multiple sets		
standardised/identical	variable		
goods-in-circulation	disused goods		
Founder's Hoards	Building/Foundation Deposits		
Objects	Objects		
broken/used	non-decorative		
non-circulating goods	variable		
CONTEXT	CONTEXT		
retrievable	non-retrievable		
peripheral/boundary location within a structure	centralised location within/beneath foundations		
TIME	TIME		
socio-economic discontinuity end of industrial eras (e.g. Late Bronze/Early Iron transition)	socio-economic continuity within industrial eras		
economic stress	economic stability		
social emphasis on living	social emphasis on deceased		

("surplus")—are closely related to processes of circulation, exchange, consumption, and deposition (Rowlands 1980): that is, the process of deposition, deliberate or otherwise, must be related to these other processes.

Table 1 provides a breakdown of buried metal deposits by content, context, and time, and attempts to characterize the object-types most frequently found in them. Because the Cypriote material record lacks metal deposits comparable to river or peat-bog finds, they are not considered in Table 1 (but see the discussion and references in Bradley 1982, 110–111; the table is also based on observations made by Bradley 1985a, 1985b; more detailed description provided by Knapp, Muhly and Muhly 1988).

It is also possible to consider the divisions proposed in Table 1 with reference to the gift-commodity model. Bradley suggests that the distinction between gifts and commodities may be recognized in the archaeological record by context, content/condition, or spatial patterning (1985a, 695). Commodities, for example, may reveal such qualities as: (1) standardization; (2) storage in readily retrievable contexts; and (3) non-specialized deposition or production treatment. Gifts tend to exhibit: (1) uniqueness, at least in their individual context, and in comparison to commodities; (2) storage in irretrievable contexts; and (3) much more complex treatment in production or deposition, particularly where objects may have been "destroyed" or "sacrificed". As commodities, objects would be valued more for their metal content; as gifts or dedications, more for their intrinsic nature. Such distinctions make it obvious that material in non-utilitarian deposits *could not have functioned* as commodities, whereas much of the material in utilitarian deposits *could*,

but need not have functioned as commodities (already emphasized in Bradley 1985b, 33–35).

Gregory has suggested that votive offerings (one-way "gifts-to-gods") remove prestige goods from circulation, ensure that they cannot be returned as counter-gifts (from other prestige-seeking individuals), and at the same time enhance the giver's prestige within society (1982, 59–61). These factors, it is argued, assume critical importance in pre-capitalist societies where the medium of social relations has to be prestige (Parker Pearson 1984, 69–71; Bradley 1985b, 31), and where accumulated goods cannot be invested, only recycled.

Although the gift-commodity model has little relevance for archaeological explanation (see Discussion), any discussion of the process of deposition must consider (a) whether this act might have been dedicatory in nature, self-serving in purpose, and therefore deliberate; or (b) if it was an act of concealment, not so much self-serving as self-insuring, and therefore more random. In the latter case, the only *intention* was to remove the item from what would become its ultimate archaeological context, because *recovery was always planned*. Bearing these distinctions in mind, the formulae presented earlier may now tentatively be refined and extended:

Commodity::production & exchange::economic::utilitarian
Gift::consumption & exchange::social::non-utilitarian

Utilitarian and non-utilitarian deposits are related not only spatially but temporally; Table 1 outlines some of these temporal aspects (based on Bradley 1985a, 1985b). It is frequently observed that the deposition of metals—intentional or random—takes place during times of social stress, competition, or discontinuity (Burgess and Coombs 1979, v; Rowlands 1980;

Hodder 1979; Randsborg 1980, 49; 1982, 138). Whether such dissipation of wealth contributed to the acquisition or maintenance of prestige is a question addressed below (Discussion). At this stage, however, two factors should be apparent:

(1) without full consideration of context, composition, and chronology, the nature of many hoards will remain enigmatic;

(2) any large deposit of (primarily) scrap metal (Bronze Age shipwrecks as an extreme example?) can reasonably be defined as utilitarian, and cannot possibly indicate "ritual destruction" at any level.

How may these summary observations and definitions (Table 1) help to clarify the purpose and nature of Cyprus' buried metal deposits? And how do they bear upon the "cultic" interpretation of *Horfunde*?

CYPRIOTE HOARDS (Fig. 1)

The literature on Cypriote "hoards", albeit not as extensive as that for the metal deposits of Europe and Britain, provides detailed exposition and classification of the material in its archaeological context (wherever known); chronology, as always, is more problematic (Bass 1967, 89; Catling 1964, 297–298; Muhly 1980, 159–160). A similar situation exists for the contemporary or nearly contemporary "hoards" of the neighbouring Aegean world (Branigan 1969; Renfrew 1967, 7–9; Spyropoulos 1972; Themelis 1983). Although the nature and purpose of hoarding activity merit little discussion in this literature, what exists is short and in accord—the hoards basically represent contemporary (or at least Late Bronze Age) metal objects buried during the course of the widespread economic collapse that ended the Late Bronze Age in the Aegean and eastern Mediterranean (Bass 1967, 166; Catling 1964, 297–298;

Karageorghis 1973, 78; Karageorghis and Demas 1984, 73–75; Lagarde 1971, 427; Muhly 1980, 159; Schaeffer 1952, 67).

Although *Horfunde* specifically sets out to determine the secular or sacred character of Cypriote hoards, and thus the motives that lay behind hoarding activity (p. 129), that goal is soon compromised (p. 134):

Die intentionelle Niederlegung, dies sei ausdrücklich betont, bildet das entscheidende Kriterium der Definition. Die Motive solcher Definierung gilt es dann zu erforschen.

This restriction not only eliminates consideration of utilitarian deposits, it consequently nullifies the inevitable conclusions of an otherwise detailed and critical effort by a scholar well-qualified to discuss the material (H. Matthäus 1985). Brief consideration of European and British bronze deposits is not followed up because their classifications are regarded to be schematic and inadequate, their interpretations unsound (at least those that do not consider "Kultniederlegungen" in the broadest sense —*Horfunde*, 134–137).

Given the nature of the Cypriote data, and the intricate typological analysis conducted, especially by content but at least partially by context (*Horfunde*, Figs. 2, 4–19), the conclusions are extraordinary. Despite the heterogeneous composition of these deposits, the authors argue that their arbitrary (i.e. non-statistical) division of the material into three main groups demonstrates selective, intentional burial, and negates the usual assumption of random deposition during times of danger or stress.

Because the research of Matthäus has contributed so much to our understanding of Cypriote Bronze Age metallurgy, it is important to consider these arguments in more detail, and to reconsider the circum-

TABLE 2
CONTENT OF CYPRIOTE BURIED METAL DEPOSITS, CULTURAL PHASES AND QUANTITIES OF OBJECT-TYPES

Site & Name of Hoard	Date (proposed)	Total No. of items	Tools Smith	Tools Agric.	Tools Woodw.	Weapons	Vessels & Stands	Ornament & Stands	Ingot	Castings	Weights & Scales	Scrap & Misc.
Enkomi "Foundry"		85	8	16	10	8	8		5	18	2	10
Enkomi "Gunnis"		18	2	10	6							
Enkomi "Maison des Bronzes"	LCIIIA	5			1		4					
Enkomi "Tresor des Bronzes"	LCIIIA	37		1	10	1		18			2	5
Enkomi "Stylaiou"		28		13	3		3	6		1		2
Enkomi "Miniature"	LCIIIB	59				1	13	2		27	1	15
Enkomi "Weapon"	LCIIIA	33		1		25	2					5
Enkomi "On.3W P.438"	LCII	5		4				1				
Enkomi "On.3W P.783"	LCIIIA	7+				1	1+		2	+		3
Enkomi "On.6W P.1458"	LCIIIA	41			3		12	1	1	1		23
Enkomi "Brunnen 212"	LCIIIA	23+		1	3	5	2	3	1		3	5+
Enkomi "Ingot"		3+	+			1			2+			+
Kition Floor III, Temple 4	LCIIIA	3		2								1
Mathiati		65	2	12	11	2			28	2		8
Pyla Kokkinokremos Gold Hoard	LCIIC	27						22		5		
Pyla Kokkinokremos Silver Hoard	LCIIC	3					1		2			
Pyla Kokkinokremos Bronze Hoard	LCIIC	43+	1	2	2	2	32	3	2		1	+
Sinda		11	2	2			3	3				1
Ayios Dhimitrios Bldg. III, A.219	LCIIC	15						1		14		
Myrtou Pigadhes	LCIIC/LCIA	6+	1				5					+
Hala Sultan Tekke Vyzakia	LCIIC	24+						14				2
Nitoukila (??)		3+		2		1+						
Enkomi Horned God Sanct.	LCIII	4		1				1				2
Cape Gelidonya (shipwreck)	LCIIC/LCIA	409	3	100	57	5	18	12	91	20	52	41

(*: 8 non-metal items—6 stone pendants, 2 faience beads)

stances and intentions surrounding the deposition of these often rich, important, and frequently-cited metal deposits.

Although in some cases the number, percentage, condition, or category of the objects in metal deposits may help to substantiate interpretations made on other bases, Table 1 makes it clear that very few "context" characteristics (in boldface) actually serve to differentiate between utilitarian and non-utilitarian deposits. Distinguishing features (standardized vs. specialized, identical vs. variable) are in fact rather subjective, and in any case may simply reflect the vagaries of archaeological excavation. *Horfunde* overemphasizes content—counts, percentages, presence/absence, intact/broken status, etc. (1986, 148–160, Figs. 4–19); hoard context receives comparatively scant attention (1986, 140–145, Fig. 2), and is presented tersely in a catalogue (1986, 173–177).

Horfunde's use of percentages, and a scheme that indicates presence/absence together with intact/fragmentary status of object-types, is particularly confusing, if not obfuscating. Some of their categorizations are idiosyncratic, and differ from those adopted here (Table 2) and elsewhere. For instance, they regard the contents of the Kalavassos Ayios Dhimitrios (hereafter Ayios Dhimitrios) "hoard" to be 93.3% *Schmiedegerät* ("foundry items") and 6.7% *Sonstiges* ("other"); the objects in question are a set of 14 weights (11 bronze, 3 hematite) and a cylinder seal (hematite). The study of these weights by Courtois (1983) suggests that they reflect attempts at standardization; the Ayios Dhimitrios "hoard" is therefore likely to be a utilitarian deposit (merchant's hoard?). Arguments based on contents, categories, percentages, and condition clearly are not going to be very decisive.

The weight of the argument presented in *Horfunde* hinges on what is termed a "spectrum of association", which implies—despite an acknowledged heterogeneity in content—a close association amongst the different hoards. Basically, these three "Concordances" (*Übereinstimmungen*—1986, 157–158, Figs. 16–18) group together those hoards in which the broadest possible combination of object-types tend to occur. Based solely on presence/absence, the groupings consider neither quantities nor percentages.

The tables appear convincing and impressive, but what do they actually reveal? One deposit, from Enkomi Ayios Iakovos (hereafter Enkomi), the "Foundry Hoard", recurs in all three groups, but surely that is to be expected from its size and the variety of its contents (Table 2). Three other deposits (Enkomi "Stylaiou", "Gunnis", and "Brunnen 212") recur in two groups, while seven others occur only once in the three groups. On this basis, *Horfunde* argues for *intentional deposition* (1986, 159); by this they mean *deposition without intention to recover* the buried items. Furthermore, on the basis of these groupings, *Horfunde* maintains that the "demonstrable connections" of these deposits to metal-working (and cultic) activity indicate deposition on religious occasions associated with such activity (1986, 166). Adding these observations to their contextual evidence, *Horfunde* proceeds to arrive at the following general characterizations:

Enkomi "Miniature" Kition "Temple 4"	Foundation Deposits or Building "Sacrifices"
Enkomi "Tresor des Bronzes" "Maison des Bronzes"	Closely related to above and defined as "cultic deposits"

Enkomi "Brunnen 212" "Foundry" "Stylianou" "Gunnis"	Their composition is similar to "Tresor des Bronzes" and Pyla Bronze hoard, so they too are defined as "cultic deposits"
Sinda and possibly Ayios Dhimitrios Enkomi "T.P. 438/1458"	
Pyla Gold Hoard	Special situation: abundance of jewellery, ceremonial context
Enkomi "Weapons"	Chance survival, "cultic"

Hortfunde's conclusion: the "hoards" represent dedications of related professional groups, whose tools represent various economic sectors and lifestyles (particularly metalworkers) in Late Bronze Age Cypriot society. The hoards therefore represent either religious dedications or closely associated building sacrifices (1986, 172).

Even though it is likely that bronzesmiths, metalworkers, and even miners enjoyed special social status because of the economic significance of their profession, it is most unlikely that the "special role" of their craft in the "religious life" of Late Bronze Cyprus can in any way help to define the nature of metal hoards. Different perspectives that place equal emphasis on temporal, spatial, and associative aspects of these deposits open the way to alternative scenarios.

Content, Context, and Chronology

The association in the same deposit of tools, weapons, and ornaments (here taken to include jewellery, statuettes, vessels, and stands) suggests that these materials had lost

their original, intrinsic value (Rowlands 1976), and should instead be regarded as "commodities". The utilitarian nature of such deposits has already been discussed. The following deposits fall under this rubric (see Table 2):

Enkomi "Foundry"
"Tresor des Bronzes"
"Weapon"
"Brunnen 212"
Pyla Bronze Hoard
Cape Gelidonya Shipwreck

Although the occurrence of tools and weapons (without ornaments) in the same deposit may be functional or fortuitous, as in the preceding cases the co-occurrence of tools and ornaments (without weapons) suggests the significance of these materials as metal. The following deposits are so identified:

Enkomi "Maison des Bronzes"
"Stylianou"
"T.P. 438/1458"

Sinda
Myrtou Pigadhes

The co-occurrence of ingots (whole or fragmentary), castings, scrap metal, slag, and miscellaneous (unidentifiable) pieces of metal, more obviously intended for remelting than other categories of material, also indicates deposits valued for their metal content (i.e. as "commodity"). The following deposits fall into this category:

Enkomi "Foundry"
Mathiati
Pyla Bronze Hoard
Cape Gelidonya Shipwreck

Enkomi "Brunnen 212"
"Ingot"
(Ingots and scrap)

Enkomi "Stylianou"
"Miniature"
"T.P. 783/1458"
(Castings, scrap, slag and miscellaneous)

TABLE 3
CONTEXT OF CYPRIOTE BURIED METAL DEPOSITS, BASED ON INFORMATION FROM *Hortfunde*, fig. 2 (1986, 140), plus brief descriptions and possible functions
KEY TO CONTENT/FUNCTION: D—Domestic; M—Metallurgical; C—Ceremonial; I—Industrial

Site & Name of Hoard	Hortfunde						Brief Description	Retrievable	Content/Function
	Pit	Cais	Floor	Well	Sand	House			
Enkomi "Foundry"									
Enkomi "Gunnis"									
Enkomi "Maison des Bronzes"							Pit at base of interior wall of building		D M
Enkomi "Tresor des Bronzes"							Cavity at base of dividing wall		D M
Enkomi "Stylianou"									
Enkomi "Miniature"							On stone wall foundation		C M
Enkomi "Weapon"							Fill between floors/ Destruction level		I M
Enkomi "Ort. 3W P. 438"							-1.75 M		M
Enkomi "Ort. 3W P. 783"							-2.35 M		M
Enkomi "Ort. 5W P. 1458"							-5.25 M		M
Enkomi "Brunnen 212"							-6.00 M		I C M
Enkomi "Ingot"									
Kition Floor III, Temple 4							Between Floors III & IIIA		C M
Mathiati							Shallow circular depression -2 ft. 3-4 ft. diameter		M
Pyla Kokkinkremnos Gold Hoard							Large shallow pit 1.9 by 1.3 M		I
Pyla Kokkinkremnos Silver Hoard							.17 M between two stones (extramural)		D I
Pyla Kokkinkremnos Bronze Hoard							Small shallow pit dug into hard-packed courtyard III		D I
Sinda							Pit covered with ashes		
Ayios Dhimitrios Bldg. III, A.219							.08 M small hole cut through floor into bedrock		D M
Myrtou Pigadhes							In silt on floor (Room 22)		C M
Hala Sultan Tekke Vyzakia							"Flat-sized" space in unstratified Feature (1315)		D M
Nitoukila (??)							Well		
Enkomi Horned God Sanct.							Pit dug into destruction of Level III B		C M
Cape Gelidonya (shipwreck)							Shipwreck		I M

The information provided in *Horfunde's* Figure 2 (1986, 140) is reproduced here (with additional contextual information) in different format (Table 3). Whereas their analysis of context is obviously concise, it is also somewhat misleading. What they class-

ify as a pit, for example, is often a very shallow cavity or depression in bedrock (e.g. Enkomi "Tresor des Bronzes", Mathiati, Ayios Dhimitrios, and perhaps Enkomi "T.P. 438/783/1458"). Furthermore, the Pyla *Kokkinokremos* Silver Hoard was

not sunk into a pit, but simply placed between two upright stones (a small bench?) on a large pithos sherd (Karageorghis and Demas 1984, 16, 64–65).

In only one case (Kition "Temple 4") was a deposit definitely placed under the foundations of a (reconstructed) sanctuary; by anybody's criteria, this ought to be a foundation ("votive") deposit (Karageorghis and Demas 1985, Vol. 2, 133–134; Karageorghis 1976, 80–81; Ellis 1968, 1–2; Knapp 1979, 85; Zettler 1986, 36). Even if the Enkomi "Miniature" Hoard's overall context was ceremonial in nature, it was found *on* a stone wall foundation, not cutting a wall, nor placed beneath its foundation (Dikaïos 1969–71, 295–296; Knapp 1986a, 78). Where location is known, the majority of these deposits were placed in "retrievable" contexts (Table 3). The exceptions are:

Enkomi "Maison des Bronzes"

"Brunner 212"

"Horned God Sanctuary"

Kition "Temple 4"

Enkomi's Horned God Sanctuary, in fact, was included in Tables 2 and 3 to provide comparative evidence from an indisputed "votive" deposit (Dikaïos 1969–71, 215–216, 295; Knapp 1986a, 13–14). Because both the Kition "Temple 4" and Enkomi "Maison des Bronzes" deposits were clearly associated with the *construction* of a building, they should be regarded as foundation deposits. Because "Brunner 212" at Enkomi is located in an indisputed industrial context (see Fig. 2), and in light of other contextual factors (presented above), it is just as likely to be a utilitarian deposit, perhaps a foundry hoard as its excavator suggested (Lagarce 1971). Regardless of the possible "ceremonial" nature of some contexts (e.g. Enkomi "Miniature" and "Brunner 212", Myrtou *Pigadhes*), which in any case need not preclude utilitarian func-

tions (Discussion), the remainder of the deposits (with known provenience) may all be regarded as utilitarian "hoards".

Enkomi "Tresor des Bronzes"

"Weapons"

"T.P. 438/783/1458"

Mathiati

Pyla Gold, Silver, Bronze

Sinda

Ayios Dhimitrios

The current lack of any quantified yardstick related to production beyond subsistence during the Cypriote Late Bronze Age makes it impossible to measure this factor against intensity of metals deposition (as has been done, for example in the Scandinavian Bronze Age—Randsborg 1974; Kristiansen 1981; or, in Lincolnshire's Middle Bronze Age, Gardiner 1980). It is possible, however, to examine qualitatively the spatial distribution of metal deposits, and to consider the suggestion of temporal or spatial/synchronic differences in utilitarian and non-utilitarian deposits (Bradley 1985a, 693).

One striking aspect of Cypriote metal deposits is that virtually all belong to a narrow slice of time in the 13th–12th centuries BC; in addition, the majority have been found within a restricted, 70 by 30 km corridor in southeastern Cyprus (see Figure 1). On the one hand, even if we were to regard this (admittedly artificial) "corridor" as a distinctive region, the only three deposits that can be defined as "votive" in nature (at Enkomi and Kition) exhibit no centralizing tendency (Bradley 1985b, 35).

On the other hand, the majority of these deposits accumulated at Enkomi, a site long known for its special role as a copper smelting and distribution center—see Fig. 2 (Dikaïos 1969–71; Courtois 1982; J. and E. Lagarce 1986). Empirical data and economic reconstructions alike now demonstrate

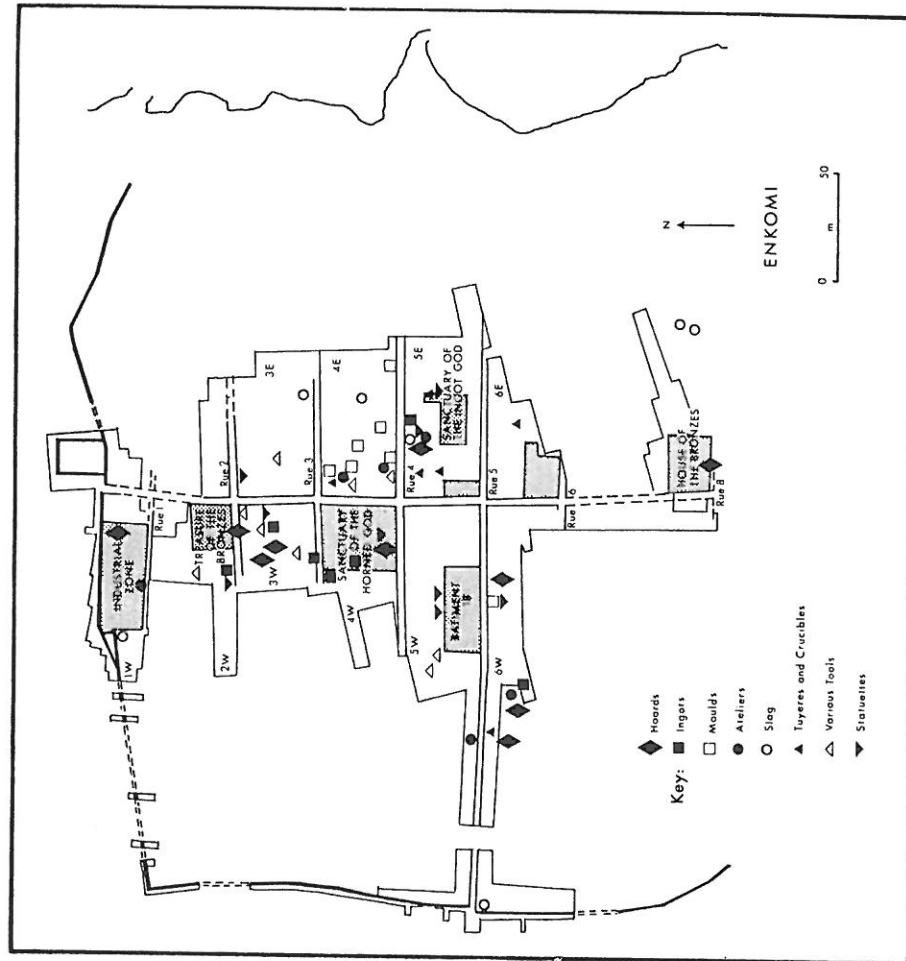


Figure 2
Site plan of Enkomi, with main metallurgical installations and architectural features discussed in text (drawn by Christina Sumner).

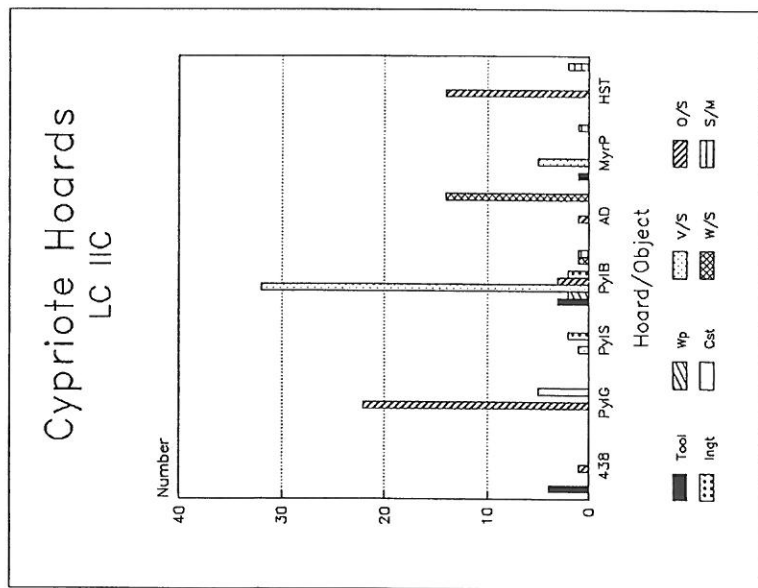


Figure 3a

Bar diagram indicating quantity of object-types in Cypriote buried metal deposits, Late Cypriote IIC (13th century BC).

ABBREVIATIONS

Abbreviations (unique to Fig. 3a—see also Table 2)

- 438—Enkomi “topographical point” 438
- PyG—Pyla (*Kokkinokremos*) gold hoard
- PyS—Pyla silver hoard
- PyIB—Pyla bronze hoard
- AD—Kalavassos *Ayios Dhimitrios*
- MyrP—Myrtou *Pigadhes*
- HST—Hala Sultan Tekke *Vyzakia*

Abbreviations (common to Figs 3a, 3b, 3c, 4a—see also Table 2)

- Tool—smithy, agricultural, & woodworking tools
- Wp—weapons
- V/S—vessels and stands
- O/S—ornaments and statuettes
- Ingst—ingots (including miniature ingots)
- Cst—castings
- W/S—weights and scales
- S/M—scrap, slag, and miscellaneous.

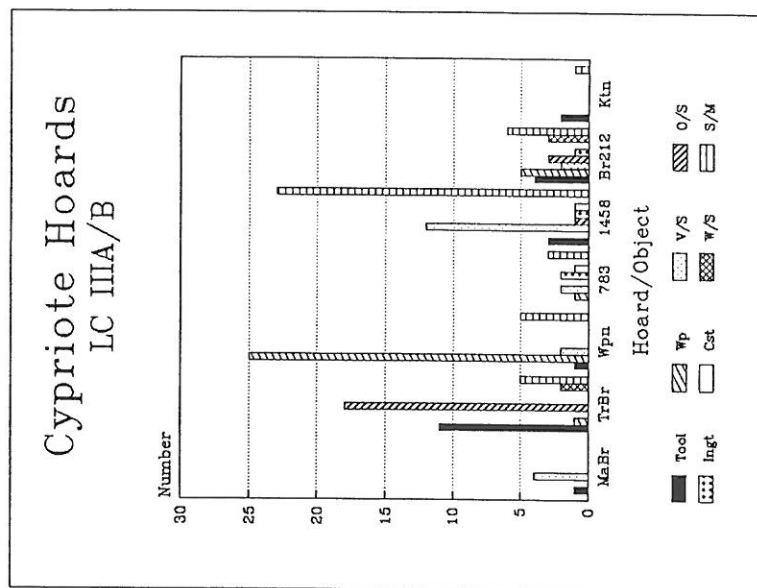


Figure 3b

Bar diagram indicating quantity of object-types in Cypriote buried metal deposits, Late Cypriote IIIA/B (12th century BC)

ABBREVIATIONS (see also Table 2)

- MaBr—Enkomi Maison des Bronzes
- TrBr—Enkomi Tresor des Bronzes
- Wpn—Enkomi Weapon hoard

- 783, 1458—Enkomi “topographical points” 783, 1458
- Br212—Enkomi Brunnen 212
- Ktn—Kition Temple 4.

unequivocally the significance of this site as a copper production center (Muhly, Maddin and Stech 1988; Knapp 1986a, 1986b; Stech, Maddin and Muhly 1985). Enkomi's role—along with that of Morphou *Toumba tou Skourou* in the northwest—as a “gateway” community highlights its importance in inter-regional systems of exchange (Portugali and Knapp 1985, 60–68).

The location of Kalavassos *Ayios Dhimitrios* at a demarcation point between the copper-rich upper Vasilikos Valley region

and coastal transshipment points may reflect its role in commodity transactions between distinct social groups (South 1987, 1984a, 16–17; South and Todd 1985; similar roles may be posited for Maroni *Vourmes* and, because of its strategic placement in the Kouris Valley, Alassa *Pano Mantilares*). Enkomi and Ayios Dhimitrios.

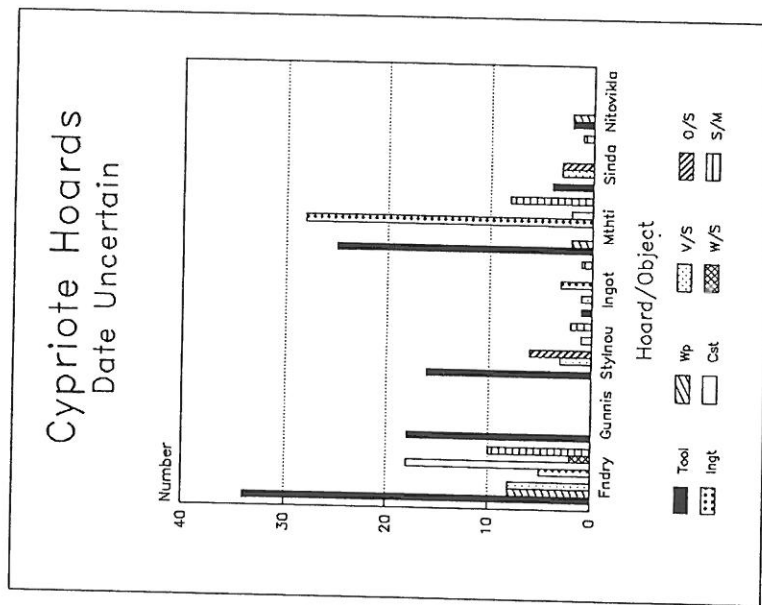


Figure 3c
Bar diagram indicating quantity of object-types in Cypriote buried metal deposits—unknown date and provenience.

Fndry—Enkomi Foundry hoard
Styliou—Enkomi Stylianou hoard
Mthti—Mathiati hoard.

Figure 3 (a–c) demonstrates that the quality of the Cypriote data (one-third of the deposits lack provenience and date) does not permit fine spatio-temporal distinctions: whether, for example, the same type of material found in utilitarian deposits in one period might be found in non-utilitarian deposits in another (Bradley 1985a, 693). More detailed consideration of other Cypriote votive deposits would necessitate examination of a much wider range of material, including ceramics, worked stone, terracotta, even other types of equipment used in metallurgical production (e.g.

Åström 1987; Dothan and Ben-Tor 1983). Such an undertaking is critical, but far beyond the scope of this study. The three “votive” deposits identified here contain such a minuscule amount of material (12 objects total) that nothing meaningful can be said about their contents vis-à-vis “hoard” contents. It remains to be seen if there is any relationship between the number of items buried and the nature of the deposit; Mesopotamian foundation deposits also tend to contain very few items (Ellis 1968; Zettler 1986).

The only striking pattern appears in

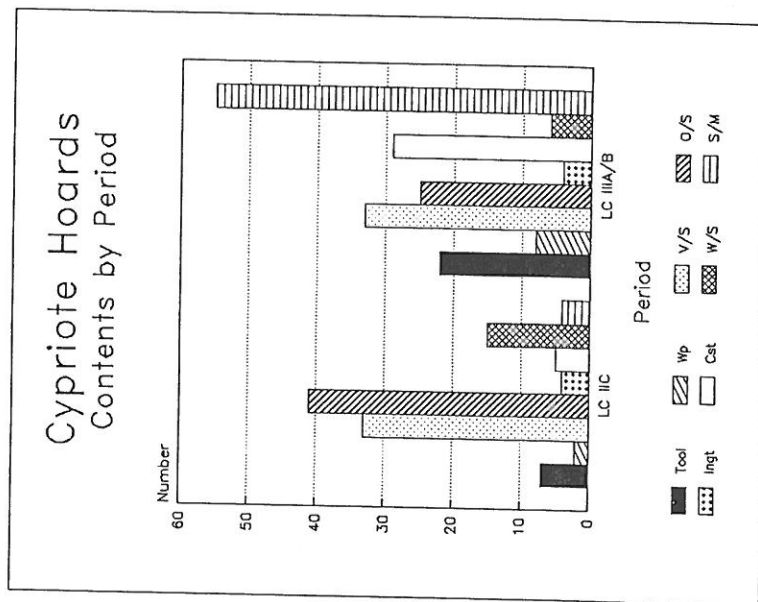


Figure 4a
Bar diagram representing total number of object-types in Cypriote buried metal deposits by cultural phase.

Figure 4 (a-c): whereas overall counts through time are quite similar for all object-types, the Scrap/Slag/Miscellaneous (S/M) category—hardly visible during LC IIC—rises to such an extent during LC III that it demands explanation. In addition, as the cumulative quantities (Fig. 4c) indicate, the unprovenanced deposits followed a very similar trend; this is the sole factor that could help to fix their dates. Observations and opinions presented in a

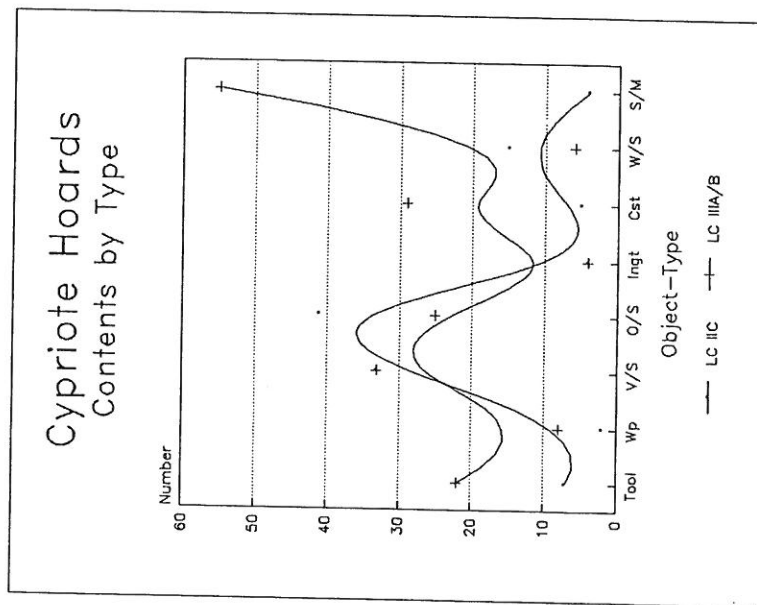


Figure 4b
Smooth-curved trend line representing total number of object-types in Cypriote buried metal deposits by cultural phase.

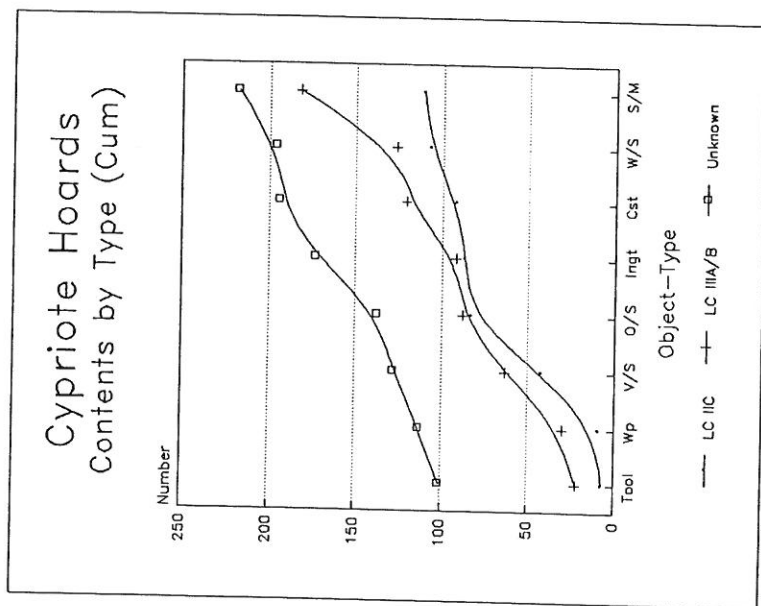


Figure 4c

Cumulative quantities (not actual numbers) of object-types in Cypriote buried metal deposits, by cultural phases and by unknown date.

DISCUSSION

Recent research into the social context of prehistoric "hoarding" behaviour stresses its deliberate aspects—the intentional consumption or ritual destruction of property (Bradley 1985a, b; Morris 1986; Parker Pearson 1984). Even though the distinction between utilitarian and non-utilitarian deposits, and the covariation of fragmentary or intact objects within them, does not

preclude the operation of a more general "depositional" process, the *intentionality* of this process is somewhat of a red herring. Hawkes saw the distinction clearly, and defined it concisely (1974, 115–116—see lead quotation): if retrieval was never intended, the deposit is a cult/votive offering (non-utilitarian); if intended and frustrated, the deposit is a hoard (utilitarian), and warrants explanation. Intentionality of deposition, in other words, is not at issue; it

is the *intention to retrieve* the material that marks the distinction between the various types of deposit.

Condemned by Rowlands as a "modernist fantasy" with "conservative ideological assumptions" (1986, 745), the ethnographic model around which these arguments revolve (Gregory 1982, 1984) maintains that *social context* serves to distinguish between commodity or gift exchange (Bradley 1985a, 694–695); by extension, transactions that had involved objects in prehistoric metal deposits would be characterized according to the presumed social distance between individuals exchanging the objects. That is, the value of an object *within* the community, as a "gift", breaks down when the object moves *between* communities, as a "commodity", and becomes valued as *metal*. The independent circulation of metal as a "commodity", and the intrinsic value of metal objects as "gifts", does not necessarily require a rigid separation between "... disinterested gift exchange and trading for gain ..." as Rowlands implies (1987, 558). But the problem is much more complex.

From Mauss to Malinowski, and from Firth to Parry, social anthropologists still struggle with the concept of the "gift" (Parry 1986). In his lucid discussion of the anthropological concept of the "gift", Parry argues that the "ideology of the pure gift" (i.e. "disinterested" gift-exchange) is more specific to highly differentiated societies with complex systems of reciprocity or market exchange, and that it may only develop in the context of a specific type of belief system, typified by major world religions with their ethical emphases on alms, selfless giving, and the like. In other words, gift ideology and the whole idea of "economic self-interest" are *our* inventions, even if they form useful constructs through which to view non- or pre-capitalist societies

(Parry 1986, 458). In more complex, state societies, 'gifts' may take on a much more 'voluntaristic' character when their political functions are taken over by developing politico-economic institutions (Parry 1986, 467).

In this light, the attempt to develop an archaeology of altruism or an archaeology of contractual obligation (Parry 1986, 467) seems futile in the extreme. In a prehistoric context, the split-image, gift/commodity construct neither reifies nor explains the postulated deposition process common to utilitarian and non-utilitarian deposits. However useful it may be to regard the objects within these deposits as indicative of either social transactions (gifts) or more balanced, economic transactions (commodities), the dichotomy neither accounts for their commonality or covariation, nor helps to distinguish between them in the archaeological record. The gift/commodity relationship simply provides another way to distinguish between social and economic, production and exchange, utilitarian and non-utilitarian.

Erecting such an ethnographic arch of explanation to prehistorical material has allowed archaeologists to suggest that the intentional deposition of wealth was a key strategy for an individual to achieve pre-eminence or prestige in a gift-oriented society. All prehistoric societies, however, cannot be characterized as exclusively gift-oriented. On the contrary, not only could accumulated or unused wealth be "invested" in precapitalist societies, the random deposition of material in buried deposits was a simple expedient intended to maintain or increase economic stature in such societies. After extensive reflection on these matters, Bradley would now agree "... that it is not necessary to scrap the orthodox interpretation of utilitarian hoards

and that their characteristic distribution may even help to emphasize the distinctive character of votive deposits ..." (1985b, 37).

Although the gift-commodity model is essentially an updated version of Marx's separation of use value from exchange value, Rowlands impugns its use because it was received by Marx "... ready made from David Ricardo and the Physiocrats" (1986, 745). When Rowlands sheds these ideological shackles, in a brief fit of what he calls "common-sense speculation", his insights are rewarding: "... highly localised pattern(s) of tool types might suggest ... that barter or trading for gain could have operated routinely at a local, community level" (1986, 746).

Rowlands long ago emphasized the connexion between access to raw materials (particularly copper) and the exchange of prestige goods (1976, 196). More recently, he has suggested that the political alliances of Later Bronze Age Europe—interregional in organization, extensive in scope—were unstable as a result of their diverse, "profit"-oriented economic activity (1984). This has a great deal of relevance to our understanding of the situation on Late Bronze Age Cyprus.

Metallurgy, Economy, and Society on Late Bronze Age Cyprus

Although the thrust of this study has been to distinguish between "hoards" and "votive" deposits rather than to compare them, in the Cypriote case both types of deposit seem to represent discontinuous phenomena; in this respect, they reflect the contemporary (ca. 1250–1150 BC) socioeconomic disruption widespread in the eastern Mediterranean. If the objects recovered from the "hoards" are indicative of

commodity transactions, the "votives" may reflect ideological *praxis*, and may be regarded as the deliberate withdrawal of "wealth" from the system, perhaps to pre-serve their "exclusivity as top-rank gifts" (Morris 1986, 9).

Like the contemporaneous, very obvious differences between local Cypriote ceramics (Base Ring II, White Slip II, et al.) and Mycenaean or "imitation Mycenaean" wares (on the problem of distinguishing LC IIC and LC IIIA ceramically and stratigraphically, see Kling 1987, forthcoming), or the establishment of defensive sites such as *Maa Palaokastro* and *Pyla Kokkinokremos* (Demas 1984; Karageorghis and Demas 1984; Karageorghis, Demas and Kling 1982) in association with the abandonment of other sites—*Kalavassos Ayios Dhimitrios* and *Maroni Yournes* (South 1984a, 1987; Cadogan 1984, 1986), the debut of these non-utilitarian deposits in LC IIIA (Fig. 3b, Table 2) is one more archaeological indicator of boundary-maintenance strategies that typify eras of socio-economic stress (Bradley 1985a, 703; Hodder 1979).

In the context of a degenerating inter-regional economic system, and a destabilized social order, Cypriote elites—who had earlier legitimised their rule over the island by accessing and adopting various symbolic paraphernalia—littered ceremonial floors with certain of these items, and buried others in close proximity. I have argued that these deliberate actions reflect the demise of an ideological system and the collapse of the associated politico-economic structure (Knapp 1988a, 152–155; 1986a, 106–109). In Gregory's terms, I might have added that those acts of destruction and deposition represented a one-way transaction that removed these items from circulation, "votive" deposits that increased the prestige of their donors in a period of stress and

change. The contents of these non-utilitarian deposits—bronze stands, metal figurines, miniature ingots and various other bronze items—represent objects of sanctification long revered in Cyprus before their final LC III (12th century BC) deposition (Knapp 1988a, 152). By virtue of their context, content, and chronological position, these paraphernalia of power could only have served as intentional, “votive” deposits (gifts), never as random, utilitarian “hoards” (commodities).

The partial contemporaneity of these distinctive deposits (LC IIIA—see Fig. 3b and Table 2) points to a “horizon of cause”, perhaps a “failure of confidence” (Hawkes 1974, 116) that not only intensified deposition (non-utilitarian) but at the same time thwarted retrieval (utilitarian). This situation must be considered not only in its immediate politico-economic framework, but also in its wider socio-historical context.

Whereas it is both possible and useful to consider this “horizon of cause” by looking independently at internal, area-specific factors of collapse (in the Aegean, Levant, Egypt, and Cyprus—Knapp 1986a, 98–104; 1988b, 181–183, 211–215), the point is that these interregional politico-economic alliances were inherently unstable: the prosperity of each polity relied on conditions of security in the entire interaction sphere (Caldwell 1964). Although the exchange of gifts on the ambassadorial level was widespread amongst these eastern Mediterranean and western Asiatic polities during the Late Bronze Age (Holmes 1978), market-oriented entrepreneurial activity dominated many spheres of exchange (Gledhill and Larson 1982; Knapp 1985; Silver 1983, 1985).

The entrepreneurial and mercantile activities of Cypriote elites during the LC II era (ca. 1400–1200 BC) made the island a

pivotal entrepot for metals, ceramics, luxury items, and comestibles moving east–west and west–east in an interregional Mediterranean exchange system (Knapp 1986b, 42–46). Cypriote and Levantine ports provided basic resources and manufactured commodities in demand from maritime and mainland polities alike. This elaborately-linked, overspecialized network of production and exchange was reliant on regular and cost-effective transport and communications, and therefore was vulnerable to a host of factors related to international conflict, competition, and political disruption (Sherratt n.d.).

On Cyprus itself, the highly specialized copper industry rested in the hands of a single, overarching authority. Production was centered at Enkomi from its inception (17th–16th centuries BC) but increasingly was apportioned out to other areas (Alassa *Pano Mantilaries*, Apliki *Karamallios*, Hala Sultan Tekke *Vyzakia*, Maroni *Vournes*, Myrtou *Pigadhes*) as demand increased, and economic reliance on the system intensified. Even though trade with the Levant apparently faltered toward the end of the 14th century BC (Merrillees 1968, 186, 202, and *passim*; Gitlén 1981, 51–56; Muhly 1982, 254, 1985, 29–30), a remarkably wide spectrum of recent research indicates that 13th century BC Cyprus witnessed an intense phase of urbanization (Cadogan 1984, 1986; Hadjisavvas 1986; Negbi 1986; South 1984a, 1987), indisputably associated with a notable expansion in trade contacts with areas to the west: the Aegean, Sicily, and Sardinia (Gale and Stos-Gale 1986; Lo Schiavo 1982, 1986; Lo Schiavo, McNamara and Vagnetti 1985; Muhly n.d.; Muhly, Madin and Stech 1988; Shaw 1984, 1986; Stos-Gale, Gale and Zwicker 1986; Vagnetti 1985; Watrous 1985, n.d.).

In the anarchic politico-economic con-

ditions prevalent in the eastern Mediterranean from about 1250–1150 BC, reduced eastern demand for Cypriote copper, and the general lack of many metals and prestige goods formerly available from that area, wreaked socio-political havoc on Cyprus itself: dramatic material evidence marks an increase in “ritual” activity associated with the Cypriote horizon of destruction, ca. 1225–1175 BC (Knapp 1986a; 1988a, 153–155).

Precisely in this context buried metal deposits begin to appear in the Cypriote archaeological record: utilitarian “hoards” appear first (LC IIC) but continue into LC IIIA, alongside the first attestation of non-utilitarian “votive” deposits. It may be hypothesized that the “hoards” are related not only to stress associated with the interregional economic collapse but also to the growth of defensive sites and abandonments indicative of intra-island strife. The apparent breakdown in Enkomi’s long-standing control over the copper industry—suggested by the growth and development of such sites as Kalavassos *Ayios Dhimitrios*, Maroni *Vournes*, Kouklia *Palaepaphos*, Alassa *Pano Mantilaries*, Hala Sultan Tekke *Vyzakia*—may indicate competition amongst elites for control over the expanding western trade.

If the politico-economic basis of Cypriote society revolved around ongoing processes of copper extraction, production, and distribution, and if the power base in society had come to rely on access to metals (tin, gold, silver) or exotica no longer available, further competition amongst intra-island elites may be expected. The appearance of “votive” deposits in ceremonial contexts during the 12th century BC (LC IIA/B) may be linked to this “aristocratic competition” as elites attempted to legitimize their position and broaden their communal appeal in

an era characterized by prolonged socio-economic stress (for a similar situation in Archaic Greece, see Morris 1987).

Whereas this scenario is in accord with Bradley’s suggestion that an increase in votive deposits typifies periods of economic stress (1985b, 38), the postulated change from social emphasis on the dead (elaborate grave goods) to social emphasis on the living (increased consumption of metals in votive deposits) is not apparent: equally striking evidence for sumptuous burial practices exists in both LC IIB (Kalavassos *Ayios Dhimitrios*—South 1984b; South and Todd 1985) and in LC IIIA (Hala Sultan Tekke *Vyzakia*—Niklasson 1983, Niklasson-Sönerby 1987; Kition Tomb 9—Karageorghis 1974, 62–94, Karageorghis and Demas 1985 Vol. 1, 264–265; on the probable redating of the upper burial in this tomb to LC IIIA, see Kling, forthcoming).

Utilitarian and non-utilitarian deposits form but one material facet indicative of a transformational era that brought important structural changes to Cypriote society. Innovation in ceramics, ritual patterns, and modes of exchange after about 1150 BC worked as an effective means of resolving intra-island conflict (Knapp 1986a, 111–113). Production and exchange may well have been reorganized to deal with ongoing copper exports to the west, a pattern that continued throughout the 11th century BC in the Aegean (Christou 1986; Coldstream 1984, 1986; Popham et al. 1982; Rupp 1987, 149, 153; Stech 1985), and for a still undetermined period of time in the western Mediterranean (Chapman 1985, 147; Lo Schiavo 1985; Lo Schiavo et al. 1985; Vagnetti 1974, 1986). Alongside this (still highly specialized?) industry grew up a technologically sophisticated iron-producing industry, reliant on local resources and probably conducted on a more localized

scale (Liverani 1987; Snodgrass 1982, n.d.; Stech-Wheeler et al. 1981; Waldbaum 1980, 1982).

Unlike its neighbours, Cyprus seems to have recovered quickly from the economic collapse that accompanied the end of the Bronze Age. Newcomers from the Aegean and the Levant settled on the island and formed new regional polities. Maritime routes westward developed and were extended in order to secure new supplies of metal and other resources in demand (Liverani 1987; Sherratt n.d.). Amongst a host of other cultural and artistic advances (see for example Iacovou 1988; Karageorghis 1983), these factors indicate the efflorescence of this highly competitive Early Iron Age Cypriote culture, the revitalization of commercial and industrial enterprise during the 11th–10th centuries BC, and Cyprus' incorporation into the broader, specifically *Mediterranean* economic and exchange system of the first millennium BC.

CONCLUSION

In their discussion of Cypriote *Hortfunde*, Matthäus and Schumacher-Matthäus attempt to imbue metals' technology and craft with an "aura of mysticism", one that transformed dull minerals into splendid *metallurgical* works of art (1986, 169–172); their purpose seems to be to make a direct link with later Greek myth (the craftsman-god Hephaistos) or tradition (Telechines and Cabiri). Rowlands, similarly caught up albeit in Arthurian legend, points to the "mystical qualities of gifts", and suggests that the "mystical powers" of swords—attached to their owners—might help to explain distributional trends and disposal patterns (1986, 746). Are we seeking to refine the interpretive range of the archaeological record, or to open the floodgates of a

literary, historical particularism, removed by several degrees—not to mention centuries—from the items in question, their hard-won spatial and temporal circumstances, and their hard-sought interpretation?

Clearly there is need to consider these intractable deposits from any perspective that may provide insight into their nature, the processes that produced them, and their implication for increased understanding of Bronze Age societies. It is especially important to look at metallurgical industries and crafts in terms of ideology and politico-economic context, both of which help to tie metallurgical production, consumption, and exchange more realistically into "religion" or "cult" (Knapp 1988a).

Bradley's wide-ranging research has confirmed (and this study hopefully witnesses) how ambiguous is the evidence of "hoards", how problematic their interpretation, how questionable their relevance to a better understanding of prehistoric exchange systems. In the Cypriote case, for example, the "precious metal hoards" (Pyla *Kokkino-kremos* gold and silver hoards, Enkomi "Tresor des Bronzes", Hala Sultan Tekke *Vyzakia* gold hoard) certainly appear—*prima facie* and with a modern bias—to be "top rank gifts"; context and chronology, however, leads to other considerations and different conclusions.

Cyprus' pivotal location amidst Anatolian, Aegean, Egyptian, and Levantine cultures heightened its economic status and ensured its access to foreign goods in demand. Whilst the archaeological record of the island demonstrates cultural diversity and interregional contact, it also reveals an indelible Cypriote quality (architecture, ceramics, script, metrology, and cylinder seal production). The isolation and insularity of Cypriote culture, the environmental

ceilings set on its socio-political developments, and the limited impact exercised by neighbouring peers forms a theme in Cypriote prehistory (Knapp 1986b, 40; Knapp and Held 1989) that must be reiterated in the face of an endless stream of research that assumes or expects to find Aegean and Levantine cultural echoes.

The present case study underscores the need to evaluate individual metal deposits in their specific socio-economic and spatial context, if we ever wish to relate these deposits to the processes that produced them, and subsequently to integrate the results into "broader discussions of prehistoric society" (Bradley 1985a, 692; *Man* 22 (1987), 560). Because of the necessity to distinguish clearly the "utilitarian" metal deposits from "non-utilitarian" deposits of more diverse makeup, only qualitative (not quantitative) detours have been taken from traditional pathways, a first step toward a more comprehensive study of metal "hoards" in the Bronze Age eastern Mediterranean world.

Only when unforeseen events disrupted the pattern of production, accumulation, storage, and retrieval does the common process of "hoarding" become visible in the archaeological record (Bradley 1985b, 39). "Votive" deposits likewise appear in discontinuous situations, and signal severe strains on the fibre of society's ideological institutions and politico-economic systems. If votive deposits reflect deliberate consumption of wealth, for whatever reason, hoards imply "deferred consumption" (Shanks and Tilley 1987, 36). In some cases, hoards may indicate business as usual, or denote trans-

actions occurring outside the social group (Bradley 1985a, 692); votive deposits never do. The (somewhat modified) "traditional" stance adopted here allows us to see both utilitarian and non-utilitarian deposits as a means of strengthening or maintaining socio-economic boundaries in times of crisis. To hoard is human, for reasons profane, rarely divine.

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REFERENCES

- ÅSTRÖM, P. 1985: Votive deposits in the Late Cypriote Bronze Age. "Gifts to the Gods". *Acta Universitatis Upsalensis, Boreas* 15 (Uppsala, Uppsala University Press, 177–9).

- BASS, G.M. 1967: Cape Gelidonya, A Bronze Age Shipwreck. *Transactions of American Philosophical Society* 57.8. (Philadelphia, American Philosophical Society).

- BASS, G.F. 1973: Cape Gelidonya and Bronze Age maritime trade. In Hoffner, H.A. (ed.) *Orient and Occident. Alter Orient und Altes Testament* 22 (Kevelaer, Verlag Butzon und Bercker), 29–38.
- BRADLEY, R. 1982: The destruction of wealth in later prehistory. *Man* 17, 108–122.
- BRADLEY, R. 1984: *The Social Foundations of Prehistoric Britain, Themes and Variations in the Archaeology of Power* (Harlow, Longman).
- BRADLEY, R. 1985a: Exchange and social distance—the structure of bronze artefact distributions. *Man* 20, 692–704.
- BRADLEY, R. 1985b: "Consumption, Change and the Archaeological Record. The Archaeology of Monuments and the Archaeology of Deliberate Deposits." *Dept. Archaeology, University of Edinburgh, Occasional Paper* 13 (Edinburgh).
- BRANIGAN, K. 1969: Early Aegean hoards of metalwork. *Annual of British School at Athens* 64, 1–11.
- BURGESS, C., AND COOMBS, D. (eds.) 1979: Preface. In *Bronze Age Hoards: some Finds old and new* (Oxford: BAR British Series 67).
- CADOGAN, G. 1984: Maroni and the Late Bronze Age of Cyprus. In Karageorghis, V. and Muhly, J.D. (eds.), *Cyprus at the Close of the Late Bronze Age* (Nicosia, A.G. Leventis Foundation), 1–10.
- CADOGAN, G. 1986: Maroni in Cyprus, between west and east. In Karageorghis, V. (ed.) *Acts of the International Archaeological Symposium, Cyprus between the Orient and Occident* (Nicosia, Department of Antiquities), 104–113.
- CALDWELL, J. 1964: Interaction spheres in prehistory. In Caldwell, J.R. and Hall, R.L. (eds.), *Hopewellian Studies. Illinois State Museum Scientific Paper* 12 (Springfield, IL, Illinois State Museum), 133–143.
- CATLING, H.W. 1964: *Cypriot Bronzework in the Mycenaean World* (Oxford, Oxford University Press).
- CATLING, H.W. 1984: Workshop and heirloom, prehistoric bronze stands in the east Mediterranean. *Report of Department of Antiquities, Cyprus*, 69–91.
- CHAPMAN, R. 1985: The later prehistory of western Mediterranean Europe. *Advances in World Archaeology* 4, 115–188.
- CHRISTOU, D. 1986: Greek and Near Eastern links with Cyprus in the Iron Age from tomb evidence at Rizokarpaso and Amathus. In Karageorghis, V. (ed.), *Acts of the International Archaeological Symposium, Cyprus between Orient and Occident* (Nicosia, Department of Antiquities), 330–40.
- COLDSTREAM, J.N. 1984: Cypriaca and Cretocypriaca from the North Cemetery of Knossos. *Report of Department of Antiquities, Cyprus*, 122–137.
- COLDSTREAM, J.N. 1986: Kition and Amathus, some reflections on their westward links during the Early Iron Age. In Karageorghis, V. (ed.), *Acts of the International Archaeological Symposium, Cyprus between the Orient and Occident* (Nicosia, Department of Antiquities), 321–29.
- COOMBS, D. 1975: Bronze Age weapon hoards in Britain. *Archaeologia Atlantica* 1, 49–81.
- COURTOIS, J.-C. 1982: L'Activité métallurgique et les bronzes d'Enkomi au Bronze Récent (1650–1000 avant J.C.). In Muhly, J.D., Maddin, R. and Karageorghis, V. (eds.), *Early Metallurgy in Cyprus* (Nicosia, Pterides Foundation), 155–76.
- COURTOIS, J.-C. 1983: Le trésor de poids de Kalavassos-Ayios Dhimitrios 1982. *Report of Department of Antiquities, Cyprus*, 117–30.
- DEMAS, MARTHA V. 1984: *Pyla-Kokkinokremos and Maa-Palaokastro, Two Fortified Settlements of the End of the 13th Century B.C. in Cyprus* (Unpublished Ph.D. dissertation, Department of Classics, University of Cincinnati).
- DIKAIOS, P. 1969–1971: *Enkomi. Excavations 1948–1958* (Mainz-am-Rhein, Philip von Zabern).
- DOTHAN, T. and BEN-TOR, A. 1983: Excavations at Athienou, Cyprus, 1971–1972. *Qedem* 16 (Jerusalem, Institute of Archaeology, Hebrew University).
- ELLIS, R.S. 1988: Foundation Deposits in Ancient Mesopotamia. *Yale Near Eastern Researches* 2 (New Haven and London, Yale University Press).
- GALE, N.H. and STOS-GALE, G.A. 1986: Oxhide copper ingots in Crete and Cyprus and the Bronze Age metals trade. *Annual of the British School at Athens* 81, 81–100.
- GARDINER, J. 1980: Land and social status—a case study from eastern England. In Barrett, J. and Bradley, R. (eds.), *Settlement and Society in the Later British Bronze Age* (Oxford: BAR British Series 83), 101–14.
- GITTLEN, B.M. 1981: The cultural and chronological implications of the Cypro-Palestinian trade during the Late Bronze Age. *Bulletin of American Schools of Oriental Research* 241, 49–59.
- GLEDHILL, J.G. and LARSEN, M.T. 1982: The Polanyi paradigm and a dynamic analysis of archaic states. In Renfrew, C., Rowlands, M. and Seagraves, B. (eds.), *Theory and Explanation in Archaeology* (New York, Academic Press), 197–229.
- GOSDEN, C. 1985: Gifts and Kin in Early Iron Age Europe. *Man* 20, 475–493.
- GREGORY, C.A. 1980: Gifts to men and gifts to god, gift exchange and capital accumulation in contemporary Papua. *Man* 15, 626–652.
- GREGORY, C.A. 1982: *Gifts and Commodities* (London, Academic Press).
- GREGORY, C.A. 1984: The economy and kinship, a critical examination of the ideas of Marx and Levi-Strauss. In Spriggs, M. (ed.), *Marxist Perspectives in Archaeology* (Cambridge, Cambridge University Press), 11–21.
- HADISAVVAS, S. 1986: Alassa. A new Late Cypriote Site. *Report of the Department of Antiquities, Cyprus*, 62–67.
- HAWKES, C.F.C. 1974: Bronze Age Hungary, a review of recent work. *Proceedings of the Prehistoric Society* 40, 113–117.
- HODDER, I. 1979: Social and economic stress and material culture patterning. *American Antiquity* 44, 446–454.
- HOLMES, Y.L. 1978: The messengers of the Amarna letters. *Journal of the American Oriental Society* 95, 376–381.
- IACOVOU, M. 1988: The Pictorial Pottery of Eleventh Century B.C. Cyprus. *Studies in Mediterranean Archaeology* 78 (Göteborg, P. Åström's Förlag).
- KARAGEORGHIS, V. 1973: A Late Cypriote hoard of bronzes from Sinda. *Report of the Department of Antiquities, Cyprus*, 72–82.
- KARAGEORGHIS, V. 1974: *Excavations at Kition I. The Tombs* (Nicosia, Department of Antiquities).
- KARAGEORGHIS, V. 1976: *View from the Bronze Age, Mycenaean and Phoenician Discoveries at Kition* (New York, E.P. Dutton).
- KARAGEORGHIS, V. 1983: Palaepaphos-Skales, An Iron Age Cemetery in Cyprus. *Alt-Paphos* 3 (Constanza, Universitätsverlag).
- KARAGEORGHIS, V. and MUHL, J.D. (eds.) 1984: *Cyprus at the Close of the Late Bronze Age* (Nicosia, A.G. Leventis Foundation).
- KARAGEORGHIS, V. and DEMAS, M. 1984: *Pyla-Kokkinokremos, A Late 13th Century B.C. Fortified Settlement in Cyprus* (Nicosia, Department of Antiquities).
- KARAGEORGHIS, V. and DEMAS, M. 1985: *Excavations at Kition V. The Pre-Phoenician Levels* (Nicosia, Department of Antiquities).
- KARAGEORGHIS, V., DEMAS, M. and KLING, B. 1982: Excavations at Maa-Palaokastro, 1979–1982. A preliminary report. *Report of the Department of Antiquities, Cyprus*, 86–108.
- KLING, B. 1987: Pottery classification and relative chronology of the LCIII-LCIIIA periods. In Rupp, D. (ed.), *Western Cyprus, Connections. Studies in Mediterranean Archaeology* 77 (Göteborg, P. Åström's Förlag), 97–113.
- KLING, B. forthcoming: Mycenaean III C1b and Related Pottery in Cyprus. *Studies in Mediterranean Archaeology* (Göteborg, P. Åström's Förlag).
- KNAPP, A. BERNARD 1979: *A Re-Examination of the Interpretation of Cypriote Material Culture in the MCIII-LCI Period in the Light of Textual Evidence* (Unpublished Ph.D. dissertation, University of California, Berkeley).
- KNAPP, A. BERNARD 1985: Production and exchange in the Aegean and eastern Mediterranean, an overview. In Knapp, A.B. and Stech, T. (eds.), *Prehistoric Production and Exchange: The Aegean and the Eastern Mediterranean. UCLA Institute of Archaeology, Monograph* 25 (Los Angeles, Institute of Archaeology), 1–11.
- KNAPP, A. BERNARD 1986a: Copper Production and Divine Protection, Archaeology, Ideology and Social Complexity on Bronze Age Cyprus. *Studies in Mediterranean Archaeology, Pocketbook* 42 (Göteborg, P. Åström's Förlag).
- KNAPP, A. BERNARD 1986b: Production, exchange and socio-political complexity on Bronze Age Cyprus. *Oxford Journal of Archaeology* 5, 35–60.
- KNAPP, A. BERNARD 1988a: Ideology, archaeology and polity. *Man* 23, 133–163.
- KNAPP, A. BERNARD 1988b: *The History and Culture of Ancient Western Asia and Egypt* (Chicago, The Dorsey Press).

- KNAPP, A. BERNARD and HELD, STEVE 1989: Problems and prospects in Cypriote prehistory. *Journal of World Prehistory* 3.
- KNAPP, A. BERNARD, MUHLY, J.D. and MUHLY, P.M. 1988: To hoard is human: Late Bronze Age metal deposits in Cyprus and the Aegean. *Report of the Department of Antiquities, Cyprus*.
- KRISTIANSEN, K. 1981: Economic models for Bronze Age Scandinavia—towards an integrated approach. In Sheridan, A. and Bailey, G. (eds.), *Economic Archaeology* (Oxford: BAR International Series 96), 239–303.
- LAGARCE, J. 1971: La cachette du fondeur aux épées (Enkomi 1967) et l'atelier voisin. In Schaeffer, C.F.A. (ed.), *Alasia I* (Paris, Klincksieck), 381–432.
- LAGARCE, J. and E. 1986: Les découvertes d'Enkomi et leur place dans la culture internationale du Bronze Récent: la métallurgie. In Courtois, J.-C., Lagarce, J. and E. Enkomi et le Bronze Récent à Chypre (Nicosia, A.G. Leventis Foundation), 60–100.
- LEVI-STRAUSS, C. 1969: *The Elementary Structures of Kinship* (London, Eyre and Spottiswoode).
- LIVERANI, M. 1987: The collapse of the Near Eastern regional system at the end of the Bronze Age, the case of Syria. In Rowlands, M., Larsen, M.T. and Kristiansen, K. (eds.), *Centre and Periphery in the Ancient World* (Cambridge, Cambridge University Press), 66–73.
- LO SCHIAVO, F. 1982: Copper metallurgy in Sardinia during the Late Bronze Age, new prospects on its Aegean connections. In Muhly, J.D., Maddin, R. and Karageorghis, V. (eds.), *Early Metallurgy in Cyprus* (Nicosia, Pierides Foundation), 271–83.
- LO SCHIAVO, F. 1985: Nuragic Sardinia in its Mediterranean Setting. *Edinburgh University, Dept. of Archaeology, Occasional Paper* 12 (Edinburgh).
- LO SCHIAVO, F. 1986: Sardinian metallurgy, the archaeological background. In Balmuth, M. (ed.), *Studies in Sardinian Archaeology II, Sardinian in the Mediterranean* (University of Michigan Press, Ann Arbor), 231–50.
- LO SCHIAVO, F., MACNAMARA, E. and VAGNETTI, L. 1985: Late Cypriote imports to Italy and their influence on local bronzework. *Papers of British School at Rome* 53, 1–71.
- MATTHÄUS, H. 1985: Metallgefäße und Gefäßunterstütze der Bronzezeit, der Geometrischen und Archaischen Periode auf Cypern. *Prähistorische Bronze-funde* 11/8, Munich, Beck.
- MATTHÄUS, H. and SCHUMACHER-MATTHÄUS, G. 1986: Zyprische Hortfunde: Kult und Metallhandwerk in der späten Bronzezeit. In Frey, O.-H., Roth, H. and Dobiat, C. (eds.), *Gedenkschrift für Gero von Merhart. Marburger Studien zur Vor- und Frühgeschichte* 7 (Marburg-Lahn, Hitzeroth Verlag), 129–91.
- MAUSS, M. 1966: *The Gift: Forms and Functions of Exchange in Archaic Societies* (London, Cohen and West).
- MERRILLEES, R.S. 1968: The Cypriote Bronze Age Pottery found in Egypt. *Studies in Mediterranean Archaeology* 18 (Lund, P. Åström's Förlag).
- MORRIS, I. 1986: Gift and commodity in Archaic Greece. *Man* 21, 1–17.
- MORRIS, I. 1987: *Burial and Ancient Society, The Rise of the Greek City State* (Cambridge, Cambridge University Press).
- MUHLY, J.D. 1980: Bronze figurines and Near Eastern metalwork. *Israel Exploration Journal* 30, 148–61.
- MUHLY, J.D. 1982: The nature of trade in the Late Bronze Age eastern Mediterranean: the organization of the metals' trade and the role of Cyprus. In Muhly, J.D., Maddin, R. and Karageorghis, V. (ed.), *Early Metallurgy in Cyprus* (Nicosia, Pierides Foundation), 251–66.
- MUHLY, J.D. 1985: The Late Bronze Age in Cyprus, a 25 year retrospect. In Karageorghis, V. (ed.), *Archaeology in Cyprus 1960–1985* (Nicosia, A.G. Leventis Foundation), 20–46.
- MUHLY, J.D. n.d.: Copper and tin ingots and the Bronze Age metals trade. In *Proceedings of the 6th International Colloquium on Aegean Prehistory* (Athens, September 1987).
- MUHLY, J.D., MADDIN, R. and WHEELER, T.S. 1980: The oxhide ingots from Enkomi and Mathiati and Late Bronze Age copper smelting in Cyprus. *Report of the Department of Antiquities, Cyprus*, 84–99.
- MUHLY, J.D., MADDIN, R. and KARAGEORGHIS, V. (eds.) 1982: *Acta of the International Archaeological Symposium, Early Metallurgy in Cyprus, 4000–500 B.C.* (Nicosia, Pierides Foundation).
- MUHLY, J.D., MADDIN, R. and STECH, T. 1988: Cyprus, Crete and Sardinia: oxhide ingots and the Bronze Age
- metals trade. *Report of Department of Antiquities, Cyprus*.
- NEGBI, O. 1986: The climax of urban development in Bronze Age Cyprus. *Report of the Department of Antiquities, Cyprus*, 97–121.
- NIKLIASSON, K. 1983: A shaft grave of the Late Cypriote III period. In Åström, P. and E., Niklasson, K. and Öbrink, U., *Hala Sultan Tekke 8. Studies in Mediterranean Archaeology* 45.8 (Göteborg, P. Åström's Förlag), 169–213.
- NIKLIASSON-SÖNNERBY, K. 1987: Late Cypriote III shaft graves, burial customs of the last phase of the Bronze Age. *Aegeum, Annales d'Archéologie Égéenne de l'Université de Liège* 1, 219–25 (Liège).
- PARKER PEARSON, M. 1984: Economic and ideological change, cyclical growth in the pre-state societies of Judaea. In Miller, D. and Tilley, C. (eds.), *Ideology, Power and Prehistory* (Cambridge, Cambridge University Press), 69–92.
- PARRY, J.P. 1986: The gift, the Indian gift, and the 'Indian gift'. *Man* 22, 452–473.
- POPHAM, M., TOULOUPOU, E. and SACKETT, L.H. 1982: The hero of Lefkandi. *Antiquity* 56, 169–174.
- PORTUGALI, Y. and KNAPP, A.B. 1985: Cyprus and the Aegean, a spatial analysis of interaction in the 17th–14th centuries B.C. In Knapp, A.B. and Stech, T. (eds.), *Prehistoric Production and Exchange: The Aegean and East Mediterranean. UCLA Institute of Archaeology, Monograph* 25 (Institute of Archaeology, Los Angeles), 44–78.
- RANDBERG, K. 1974: Social stratification in Early Bronze Age Denmark, a study in the regulation of cultural systems. *Prähistorische Zeitschrift* 49, 38–61.
- RANDBERG, K. 1980: *The Viking Age in Denmark, The Formation of a State* (London, Duckworth).
- RANDBERG, K. 1982: Rank, rights and resources, an archaeological perspective from Denmark. In Renfrew, C. and Shennan, S. (eds.), *Ranking, Resources and Exchange* (Cambridge, Cambridge University Press), 132–39.
- RENFREW, C. 1967: Cycladic metallurgy and the Aegean Early Bronze Age. *American Journal of Archaeology* 71, 1–20.
- ROWLANDS, M.J. 1976: *The Production and Distribution of Metalwork in the Middle Bronze Age in Southern England*. (Oxford: BAR British Series 32).
- ROWLANDS, M.J. 1980: Kinship, alliance and exchange in the European Bronze Age. In Barrett, J. and Bradley, R. (eds.), *Settlement and Society in the British Later Bronze Age* (Oxford: BAR British Series 53), 15–55.
- ROWLANDS, M.J. 1984: Conceptualising the European Bronze and Iron Ages. In Bintliff, J. (ed.), *European Social Evolution* (Bradford, University Press), 147–56.
- ROWLANDS, M.J. 1986: Modernist fantasies in prehistory? *Man* 21, 745–746.
- ROWLANDS, M.J. 1987: The concept of Europe in prehistory. *Man* 22, 558–559.
- RUPP, D.W. 1987: *Vive le Roi, the emergence of the state in Iron Age Cyprus*. In Rupp, D. (ed.), *Western Cyprus, Connections. Studies in Mediterranean Archaeology* 77 (Göteborg, P. Åström's Förlag), 147–168.
- SCHAEFFER, C.F.A. 1952 *Enkomi-Alasia I. Nouvelles Missions en Chypre 1946–1950* (Paris, Klincksieck).
- SHANKS, M. and TILLEY, C. 1987: Abstract and substantial time. *Archaeological Review from Cambridge* 6, 32–41.
- SHAW, J.W. 1986: Excavations at Kommos (Crete) during 1984–1986. *Hesperia* 55, 219–269.
- SHAW, J.W. 1984: Excavations at Kommos (Crete) during 1982–1983. *Hesperia* 53, 251–287.
- SHERATT, E.S. n.d.: Patterns of contact between the Aegean and Cyprus in the 13th and 12th centuries B.C. Paper presented at Fifth International Colloquium on Aegean Prehistory, Sheffield University.
- SILVER, M. 1983: Karl Polanyi and markets in the ancient Near East, the challenge of the evidence. *Journal of Economic History* 43, 795–829.
- SILVER, M. 1985: *Economic Structures of the Ancient Near East* (Croom Helm, Beckenham, Kent).
- SNODGRASS, A.M. 1982: Cyprus and the beginnings of iron technology in the eastern Mediterranean. In Muhly, J.D., Maddin, R. and Karageorghis, V. (eds.), *Early Metallurgy in Cyprus* (Nicosia, Pierides Foundation), 285–96.
- SNODGRASS, A.M. n.d.: The Bronze/Iron transition in Greece. In Thomas, R. and Stig-Sorenson, M. (eds.), *The Bronze/Iron Transition in Europe* (Oxford: B.A.R. International Series).
- SOUTH, A.K. 1984a: Kalavassos-Ayios Dimitrios and the Late Bronze Age of Cyprus. In Karageorghis, V. and Muhly, J.D. (eds.), *Cyprus at the Close of the Late*

Bronze Age (Nicosia, A.G. Leventis Foundation), 11–18.

SOUTH, A.K. 1984b: Riches of Late Bronze Age Cyprus. *American Schools of Oriental Research, Newsletter* 36(2), 3–5.

SOUTH, A.K. 1987: Contacts and contrasts in Late Bronze Age Cyprus, the Vasilikos Valley and the West. In Rupp, D. (ed.), *Western Cyprus, Connections. Studies in Mediterranean Archaeology* 77 (Göteborg, P. Åström's Förlag), 83–95.

SOUTH, A.K. and TODD, I.A. 1985: In quest of the Cypriot copper traders: excavations at Ayios Dhimitrios. *Archaeology* 38(5), 40–47.

SPYROPOULOS, T. 1972: *Hysteromykenaikei Helladikoi Thesaurioi. Archaeological Society Publication* 72 (Athens, Archaeological Society).

STECH, T. 1985: Copper and society in Late Bronze Age Cyprus. In Knapp, A.B. and Stech, T. (eds.), *Prehistoric Production and Exchange: The Aegean and East Mediterranean. UCLA Institute of Archaeology, Monograph* 25 (Institute of Archaeology, Los Angeles), 100–105.

STECH, T., MADDIN, R. and MUHLY, J.D. 1985: Copper production at Kiton in the Late Bronze Age. In Karageorghis, V. and Demas, M., *Excavations at Kiton V.1. The Pre-Phoenician Levels* (Nicosia, Department of Antiquities), 388–402.

STECH-WHEELER, T., MUHLY, J.D., MAXWELL-HYSLOP, K.R. and MADDIN, R. 1981: Iron at Taanach and early iron metallurgy in the eastern Mediterranean. *American Journal of Archaeology* 85, 245–268.

STOS-GALE, Z.A., GALE, N. and ZWICKER, U. 1986: The copper trade in the south-east Mediterranean region. Preliminary scientific evidence. *Report of the Department of Antiquities, Cyprus*, 122–44.

THEMELIS, P.G. 1983: An eighth century goldsmith's workshop at Eretria. In Hägg, R. (ed.), *The Greek Renaissance of the Eighth Century B.C.* (Svenska Institutet i Athen, Stockholm), 157–165.

VAGNETTI, L. 1974: Apunti sui Bronzi Egei e Cipriote del ripostiglio di Contigiano (Reiti). *Mélanges de l'École Française de Rome Antiquité* 86, 657–671.

VAGNETTI, L. 1985: Late Minoan III Crete and Italy, another view. *Parola del Passato* 220, 29–33.

VAGNETTI, L. 1986: Cypriot elements beyond the Aegean in the Bronze Age. In Karageorghis, V. (ed.), *Acts of the International Archaeological Symposium: Cyprus between Orient and Occident* (Nicosia, Department of Antiquities), 201–216.

WALDBAUM, J. 1980: The first archaeological appearance of iron and the transition to the Iron Age. In Wertheim, T.A. and Muhly, J.D. (eds.), *The Coming of the Age of Iron* (New Haven and London, Yale University Press), 69–98.

WALDBAUM, J. 1982: Bimetallic objects from the eastern Mediterranean and the question of the dissemination of iron. In Muhly, J.D., Maddin, R. and Karageorghis, V. (eds.), *Early Metallurgy in Cyprus* (Nicosia, Pterides Foundation), 325–50.

WATROUS, L.V. 1985: Late Bronze Age Kommos, imported pottery as evidence for foreign contact. *Scripta Mediterranea* 6, 7–10.

WATROUS, L.V. n.d.: Foreign trade at the Minoan harbor town of Kommos, the Late Bronze Age imported pottery. In *Proceedings of the 6th International Colloquium on Aegean Prehistory* (Athens, September, 1987).

ZETTLER, R.L. 1986: From beneath the temple: inscribed objects from Ur. *Expedition* 28(3), 29–38.

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MEGALITHIC MADNESS AND MEASUREMENT. OR HOW MANY OLIVES COULD AN OLIVE PRESS PRESS?

Summary. *Nineteenth century explorers and travellers in north-west Libya were intrigued by the hundreds of well-preserved stone structures which they took to be prehistoric megaliths of ritual significance. H.S. Cowper made a particular study of them in this belief, measuring, sketching and photographing quite a number of the monuments. The admirably meticulous character of his work was undone by his fanciful interpretation and it was soon revealed that the stone structures were, in fact, parts of Roman olive presses.*

This article, however, considers the lasting importance of Cowper's work in the context of a detailed discussion of the processing capacity of ancient olive presses (that is what quantity of olives comprised a single press load and how much olive oil was likely to be yielded). Comparison with literary and ethnographic evidence suggests that the Tripolitanian presses had a large potential capacity. An order of magnitude figure of c. 9–10,000 kg is proposed for the annual output of olive oil from one of these large presses.

INTRODUCTION

From the early nineteenth century the interior of Turkish controlled Tripolitania (modern Libya) was opened up as a favoured route of travel for European explorers setting out for Central Africa. Many of these travellers used their time in Tripolitania as a training period, testing their instrumentation and powers of observation on whatever caught their eye. Heinrich Barth was the first of them to record in any detail the curious monumental stone structures, known locally as senams, of the hilly region (Gebel) to the south of both Tripoli and the ruins of the Roman city of Lepcis Magna. He described (1857, 47–48 and cf.

56) "a pair of immense slabs, above 10 ft [3 m] long and regularly hewn, standing upright, which at first I supposed to be the remnants of a large building; but having since had a better opportunity of studying this subject, I concluded they were erected, like the cromlechs for some religious purpose" (Fig. 1). At another site he recorded one of the monuments (Fig. 2) in more detail (1857, 58–62):

"It consists of a pair of quadrangular pillars erected on a common basis . . . The two pillars . . . are 10 ft high. The western pillar has three quadrangular holes on the inside, while the corre-