

The definition of the study object
and the study of
production processes
in Archaeology

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Em português pp. 399

Archaeology, like all scientific activity, is construed within a given social and material frame, constituting given limits. The archaeologist cannot isolate herself from the influence of socio-economic, political, cultural, artistic, or general scientific situations. But, at the same time, Archaeology can obtain a certain relative autonomy as a social activity, also in relation to other scientific activities. This relative autonomy is given, partially, from the creation of institutions specialized in Archaeology, and partially through the definition of a specific study field and through delimitations of study objects and the concepts and definitions developed for their study (Cornell 1993c). In this short contribution, I shall discuss some theoretical and methodological problems connected to the delimitation of the study object in Archaeology. There is an urgent need to vitalize the discussion on some of these central questions in the theory and method of Archaeology.

1. The delimitation of study objects and social theory

The concept of cultural context

As demonstrated by Víctor Núñez Regueiro (1974), the concept of cultural context has often proved to be more of an obstacle than a constructive tool for archaeological interpretation in Argentina. The generalized definition of cultural context as a series of given traits is very close to the definition developed by the school of *Kulturkreislehre* (or the Historical-Cultural school). This school has influenced Argentine Archaeology in profound ways.

The problems are manifest at various levels, in theory and practice. At a theoretical level, we can choose the *Kulturkreislehre* of Fritz Graebner (whose major theoretical work was published in Spanish in Argentina in 1940) as an example. The absence of explicit hierarchies in the lists of cultural traits is evident. Concrete observations on whatever sort of material culture is mixed up (types of pillows and methods for the construction of buildings, for example), and, in its turn, mixed up with social elements (e.g. kinship terminology systems), and even mixed with categories used by biological anthropology (particularly stressed in Argentine applications; see Arenas & Baffi 1991-1992). This almost complete lack of hierarchisation or systematisation generates serious problems in the definition of the spatial distribution of a given "cultural circle". The specific content of the study object as a phenomenon is not defined, and the resulting assemblage of "everything" turns out impossible to manage. These problems are evident even in more systematic attempts to apply this methodology in Argentina, as can be seen, for example, in the study of Salvador Canals Frau from 1953.

In the archaeological applications the definition of cultural contexts generally presupposes, conscientiously or not, a certain hierarchisation of material elements, but almost always without any sort of theoretical discussion. Brought to the archaeological field, the cultural contexts have been defined in broad terms, generally departing from ceramics, or, when this category is absent or difficult to handle, the lithic material. In more systematic studies on ceramic producing cultures, the diagnostic ceramic (ceramics with many decorative or other formal elements well defined) has been given particular importance. Other categories of material culture and other related items (bones, macrofossil etc.) remain at a secondary level in the analysis. Archaeologists still speak of a "Diaguita culture" or a "Santa María culture", for example, though on sites with abundance of ceramics with Santa María decorative elements, the difference between the general assemblages from different sites are rampant. I can mention as an example of this, the notable variability in building and general material culture encountered in the Santa María valley, the Tafi del Valle, and the Tapia-Trancas area. The problem becomes even more acute if different cultural contexts are considered. How can we, for example, define adequately the difference between Candelaria culture and Santa María culture?

It is thus necessary to seek another approach, in which different elements of social, economical, political etc. character are hierarchized. The archaeological material must be studied as units (trench, habitations, tombs etc.), related systematically one to the other, and correlated to general concepts and theories. Chronology is an important interpretative factor in explaining variability (Cornell & Johansson 1993), but not the only possible explanation to variability. In ceramics, for example, variability may often depend on accessibility of raw material. In some cases, as proposed by Marta R A Tartusi and Víctor Núñez Regueiro (1993) for the "Condorhusasi" decorative pattern, the variability may be caused by ceremonial traditions. The decorative pattern on Santa María ceramics may, possibly, be interpreted similarly as a shared mythological tradition (Cornell 1993a). In the case of "Incaic" style, the decorative pattern represents an empire, and authentic vases as well as imitated, more or less similar, copies can be differentiated (Calderari & Williams 1991). In other cases, the variability may be explained by other variables, e.g. status or class differences.

Society

Concepts defining different social forms are vital tools for defining the study object in Archaeology. There are some central problems in using the concept of society that remain to resolve. The debate on synchronic versus diachronic approaches demonstrate a basic analytical problem in the definition of societies. In the synchronic and functionalist approach the general study object might be defined as a social unit determined by functional, internal, adaptative relations. In this approach, structural change is seldom addressed. The factor of time operates only within a given system (like e.g. cyclical change; Leach 1954, Gluckman 1955). In the diachronic approach, on the other hand, time is a fundamental category. A basic theoretical and methodological problem in this diachronic approach is how to define the study object in the stream of time. Most diachronic case studies propose just to enumerate a series of static situations ordered in time sequence, and does not stress, and even avoids to mention, the processes of change.

Functionalism attempted to solve this general problem widening the synchronic approach, discussing how each system adapts its structure as an answer to external factors (e.g. a change of the climate). This means that a given system strives to maintain its form and that change is the result of an adaptation to external circumstances (Radcliffe-Brown 1952). Other anthropologists, like Robert Lowie, sought explanations to change not within a given structure, but in parallel structures or groups. For example, the origin of the state, according to this author, is to be found in age groups or warrior groups, existing side by side to kinship systems (Lowie 1921). This type of solutions has been criticized, since it avoids the problematic of internal structural change (see Balandier 1967, pp. 179-185).

The archaeologist Colin Renfrew, working in a functionalist and systemic tradition has tried to integrate, in his own theoretical approach, a conceptualization of internal change in societies (Ren-

frew 1984). According to him, a system is constituted by various subsystems (political, religious, subsistence etc.). Each one of these subsystems tries to maintain equilibrium, that is, tries to avoid structural change. Structural change can occur, however, given certain specific circumstances. A change must occur, through particular innovations, in more than one given subsystem. Through secondary effects on other systems, the "multiplier effect" (a term borrowed from John Meynard Keynes), the final result is a structural change of the system as a whole. Renfrew particularly stresses the importance of activities of "management" as decisive for provoking structural change (see Peer-Polity interaction 1987). Renfrew's approach is interesting and valuable, but, in the end, considers structural change as the end effect of punctual "innovations". Thus, change in a structure is, according to Renfrew, the result of an adaptative process.

Operative definitions

In several anthropological studies, societies are labelled, in general terms, by more or less static sociopolitical terms, such as band, chiefdom, state (Service 1976), or with concepts related to some aspect of production, such as hunter-gatherers, agriculturalists, industrialists. The definitions are, generally, not very strict. Service attempted to define his concepts more in detail; but in most archaeological applications the definitions are modified or used in a non-systematic fashion.

The differences between sociopolitical concepts like band, chiefdom and state, in the archaeological context, remain little studied. Similarly, definitions vaguely related to production are applied carelessly. The fact that agriculture and hunting exist in industrial contexts has been left without discussion, for example. Thus, these concepts are not, in a strict sense, based on a structural model, but are more related to the "ideal type" concept of Max Weber (1958). According to Weber, the type was not a strict description of societies, but an analytic tool. These "ideal types" can, according to my opinion, be useful as such analytic tools, as "positive" entities, as a sort of approximation to concrete situations. They are necessary to the archaeologist, who cannot approach a material without some preliminary definitions. The methodology and the methods selected depend, largely, on these preliminary definitions (hunting?, agriculture?, industry). Nonetheless, these concepts are mere tools, and must be used with care, and not as dogmatic truths. For a more profound analysis we need other concepts.

Karl Marx' conceptualization

The concept of mode of production, developed by Marx, is of great importance to socio-economic analysis, though there are multiple interpretations and mis-interpretations of this concept in anthropological and archaeological literature. Seeking the sense of the term in Marx' Capital ((1867) 1962, (1885) 1963, (1894) 1964), some interesting points can be stressed. First, the concept is relevant only at a high level analysis, in the interpretation of societies. This means that an archaeological site may have been part or participant in a "mode of production", but that the individual site cannot represent the mode of production as such. Further, the mode of production is a generalization, and incorporates various similar concepts. Each region or area must not, thus, have had its own mode of production.

Second, this concept describes complex relations between human beings, their relation to nature, and the products produced by humans. A mode of production cannot be defined by isolated criteria, such as a given type of grains or a given type of tools.

Third, and this is a key-point here, the concept describes a structural change, e.g., the processes of internal change in a structure. In this sense Marx' concept surpasses the functionalist terminology. It should be evident that the definition and interpretation of a mode of production is a complex task, and that it can only be an important objective in our research. Marx' himself developed a profound and valuable analysis of the capitalist mode of production but contributed little to clarify other modes of production. It is futile to search for detailed recipes in his works. It is better to leave several of the concepts he developed behind, as for example the Asiatic mode of production (see Cornell 1993b).

In an analysis of a Marxist character we must develop a series of studies on different aspects of a society, before defining the exact character of its mode of production. In the process of archaeological studies terminologies of Webers type may be of great value as operative tools (such as domestic unit, hunting station, a centre, etc.).

There are also other relevant concepts developed by Marx'. In another context (Cornell 1993c, Cornell 1993b), I have stressed the value of the concept of productive forces, representing a relationship between human beings and "nature". This concept seems to be of greater utility than the concept of ecology which is evidently linked to functionalist conceptualizations.

Necessity and surplus

The use of the concept of necessity or utility and the concept of surplus play an important role in anthropological and archaeological debate, and deserve some comments.

Karl Marx discussed the significance of goods in capitalism and according to him, the value of a good, in the last instance, is determined by the mean human labour invested in the production of a good in a given society. Raymond Firth (1989) used the concept of utility in his criticism of Marx' concept of value. Firth quote various neo-classical economists to make his point, and stress factors of demand and supply as determinants for the value of a given good. This is actually a "traditional" criticism of Marx', developed in the latter part of the 19th century. There are various contemporary economists that do not accept this criticism. Luigi Passinetti (1975), for example, stresses that the interpretation of Marx' and the neo-classical interpretations are equally probable. Further, one must stress that Marx' allowed for a series of factors influencing the fluctuations on the price of merchandise, one of these factors being demand and supply in given historical circumstances (see 1962: 263-266, 657-670; 1964: 115-146, 649-650) . Further, he stresses that these fluctuations are of great historical importance for the process of accumulation of capital. Marx' also stressed the importance of the allocative mechanisms, and the elasticity of social necessity:

The social necessity, or the use-value brought to a social potential, constitute here a determinant factor in relation to the total labour time in a society that correspond to to each of the specialized frames of production. (1964: 649)

There is another type of criticism of Marx', according to which Marx' analysis is "purely" ideological, postulating the existence of an absolute necessity. According to Quirís & Tiscornia (1988) necessity should not be an objective factor, as Marx, according to these authors believed. On the contrary, the necessity is always socially defined according to Quirnos & Tiscornia, and thus "First the surplus is defined, and then the minimum." (p. 31). There are various problems with the approach of Quirís & Tiscornia. It is not possible to deny that there are some minimal requirements for the survival of human beings (air, energy etc.). These basic necessities objectively exist. At the same time, it is impossible to define these necessities exactly, due to the great variability between different historical periods and different geographical regions. Marx wrote on the necessities and demands in a capitalist society that *".../ a certain defined quantity of social necessity require a specific quantity of goods on the market. But the definition of this quantity is all through elastic and fluctuating."* (Marx 1964: 198) and the use value depends on the *".../ quantitatively defined necessity a society demand of this concrete type of product/.../"* (1964: 648-649). It should further be noted that Marx' had observed that some "savage" societies dedicated relatively little labour time to cover necessities of food (Marx 1962: 537-538), what Sahlins (1974), ignoring Marx, posteriously named the original affluent society. The surplus, however, was in these cases not invested in labour of great scale.

According to Marx utility and surplus are intimately related. The fundamental point is that the social classes are based fundamentally, on the social character of production, not on that of the distribution (1963: 120), or, expressed differently, the production is the determinant factor, not distribution. This means, focusing on production. Thus Marx discussed the fetichism of the goods in capitalist society, where the product attains a mysterious value at the market. Marx tried to show that

this value, fundamentally, was based on human labour. As has been shown by Maurice Bloch, this fetishism exist in various non-capitalist societies as well, but is developed in other contexts and not based on generalized goods in these cases (Bloch 1989).

The production process

The conceptualization of the production process can be of great value for the archaeologist. Several recent studies, in which the analysis of aspects of production processes have been in focus (for example Arnold 1985, Clark 1986, Lackey 1986, Mitchell 1985, Prehispanic agricultural... 1987 etc.) and some more general discussion on production and technology (Costin 1991, Nelson 1991) demonstrate a growing interest for this topic. The terminology is still, however, little developed. I have discussed some aspects of this problem (Cornell 1993b; see also, for interesting approaches, Tosi 1984, Myrdal 1990). In this connection I will only comment on two general studies.

Margaret Nelson explicitly works with conceptualisations based on neo-classic economic theory. Nelson discusses in terms of "strategies" for organizing the solution to concrete problems (in relation to hunting, cultivation, and so on). The base for the argument is the existence of a specific pattern of optimal human behaviour for adaptation to different situations. Nelson does mention some of the problems in this approach (1991, p. 61 and 87-88), but, she nevertheless applies this conceptualization throughout. A major setback with this approach is that the frame for given decisions of strategy are left without discussion. These frames, based on the knowledge of the environment, the development of the forces of production, and the socio-economic realities in general are determinant.

Cathy Costin (1991) stresses the difference between studies on production and studies on distribution, and points to the lack of systematic studies of the former. Her argumentation is of great interest, and contains valuable proposals for further studies.

Nevertheless, Costin is heavily influenced by neo-classic economic theory, particularly when she defines types of specialization from types of demand (1991, p. 7, see Cornell 1993b, p. 71). Some of her more general conclusions are dubious, particularly this one

For any product, there may be few or many producers relative to the total consuming population. A product that has a high number of producers in relation to consumers will have a low degree of specialization, while a product that has relatively few specialists in proportion to consumers will have a high degree of specialization. (1991, p. 4)

This is probably a common pattern, but there are notable and important exceptions. In the production of luxurious items, the number of intervening specialists may be very high, while the group of consumers may be indeed very small.

Costin defines specialization as "differential participation in specific economic activities" (p. 43), a factor of differentiation. This type of definition is generally related to specialized techniques. There is another type of specialization, not including specialized techniques, but incorporating different scales of labour. The classic example may be the construction of a large temple, often realized with relatively simple methods of construction, but with an enormous accumulation of human resources. In this case, the individual labourer does carry out a "special" work, but is not, technically, specialized.

Conclusions of part 1

In order to delimit the object of study of Archaeology, I have stressed the necessity to go beyond static approaches in order to focus on processes of change. In the process of archaeological work, the use of static categories, such as the *ôldeal typeö* of Max Weber, may nevertheless be of great value as operative tools.

Focusing on change I pointed to the potential value of the concept mode of production, and discussed some problems related to the study of production.

The articulation of these concepts to archaeological practice is a central problem. To achieve this objective, respecting the complexity of socio-economic forms, a systematisation of the archaeological material is necessary.

2. The objects of study and archaeological fieldwork

The practice of Archaeology

In archaeological practice, we are constantly confronted with a series of methodological problems, and all of them contain problems of theoretical nature. The delimitation of study objects, on the level of the region, the site, and the feature, is a major problem. Archaeological practice confronts us with a wide variety of situations. In some cases, there are visible remains above ground, e.g. stone walls, and in other cases there are no visible signs above ground. To each situation a specific set of methods and a specific methodology must be applied. My personal field experience is limited to the southern cone, but various field seasons during several years in Northwestern Argentina has brought some reflexions on these problems. There are certainly other colleagues with wider experience that could present more important contributions.

Unit of provenience

Unit of provenience is a fundamental concept in archaeological methodology. For the archaeological register/archive, developed in the practical experience of field-work, it seems favourable to construct small units of provenience, in order to facilitate posterior regrouping and analysis of the material. In relation to excavation, the methods of registration of stratigraphical units proposed by E C Harris are of great importance (Harris 1979). When possible, it is best to nivellate items directly in three dimensions. In some situations it is, however, difficult to nivellate all material directly. When operating with great masses of material, often fractured and identified only when screening, small defined units of provenience, englobing several findings, are necessary. In archaeological excavations in NW Argentina, there are often situations when it is impossible, at least ocularly, to differentiate cultural layers on the basis of colour or texture. Thus, the "cultural layers" tend to take great dimensions. In such situations it may be useful to operate with artificial layers, subdividing cultural layers of all too great dimensions. It is often possible to differentiate vertical variability in assemblages of artefacts and other materials posterior to the excavation.

As an example of the complexity of the situation, I will just mention one case. At the site El Pichao (STucTav5), Valle de Santa María, a site exposed for severe erosion and destruction floods in large parts, excavations were carried out in several different structures. In a structure named Unit 12, defined preliminary as a "domestic unit", situated on a relatively protected position in relation to erosion, two different floor levels were identified in the stratigraphy when excavating, as well as other features (concentration of carbon and pits with ashes). The floor levels were difficult to detect in the profile or section, but in the process of excavation identified as compactation of earth, on and in which there were several ceramic fragments and animal bones in horizontal position. The luminescence datings of the ceramic fragments gave, in some instance, inverted datings. My first response was to discard all datings, but this seemed impossible, since most datings from the site were coherent internally (Cornell & Johansson 1993). My second response was to discard my own perceptions and deny the existence of floor levels. This, however, was neither convincing, since the floor levels were quite evident to several excavators, including workers from the near-by village. Thus, my final interpretation was that the ceramic material not corresponding to floor levels had been accumulated as filling. A part of the fill material had been "new" when the filling occurred, and a part "old". Another important factor, complicating still more the situation, was the activity of rodents, that could in some instances move materials between levels.

The exposed example shows that stratigraphy in a strict sense (Harris 1979), as well as the study of assemblages (artefacts and related materials) gives valid and important information. It is important to carry analysis of both types, in order to contrast the information. Rejoining artefacts, dating, detailing the stratigraphy: all are valid methods. In some instances the information based on different methods will seem contradictory, but this may often be resolved in a more profound analysis. In some

cases, there may occur actually a contradiction that cannot be resolved.

In the analysis of materials accumulated in field-work, the units of provenience differ according to the problem under discussion. In some circumstances comparative analysis is based on stratigraphic levels (often combined levels), or given assemblages. In other situations, the comparative analysis is based on structures ("houses", tombs etc.), or, in some cases, on individual sites or even regions. It is of central importance to maintain a systematic approach. For example, when making a quantitative seriation (Ford 1962) it is important that the units of provenience are compatible one to the other. In the case of the seriation of materials from the Hualfín Valley, established by Alberto Rex González (González & Cowgill 1975) on the base of the work carried out by engineers Weiser and Wolters to conform the Muñiz Barreto collection, an advantage in favour of the commensurability of the units is that they all are tombs. The commensurability is also important as to what concerns the depository character of the material. Material accumulated as trash or filling ("secondary refuse" according to Michael Schiffer 1987) is not directly commensurable to deposits of "primary" or "de facto" type. The concrete articulation between types of deposits varies according to regions and periods. The categorisation by Schiffer is valuable, but the complexity of the material often demands a more refined categorisation (Cornell & Johansson 1993). In quantitative seriation it is also necessary to take into account the variability of processes that may have provoked changes to the deposited material posterior to the moment of interest to us (cultivation, plundering etc. as well as "natural" processes, the forces of wind and water etc.).

In general, the analytic units are units to which we ascribe a function or a meaning, according to defined "ideal types". The units interpreted as "domestic units" are, for example, an example of a concept from social theory articulated to the archaeological material through operative methods. Domestic units are defined archaeologically by certain recurrent patterns in the material organization (Cornell 1993b, pp. 83-92, 145-188). These interpretations also operate at the level of the site, in the definition of villages and centres, for example. In these cases, the definition of the type is important also when defining the limits of the site (Cornell 1993b, pp. 137-140).

In all archaeological projects, the definition of the general methodology is important. If there is no coherence and no defined strategy a project of investigation does not exist, but only a series of parallel studies, of which none, in general, achieve concrete results. The limitations of resources, further, oblige us to use instruments and money in a rational manner. For example, all field projects may start with general prospection and mapping of visible structures and topography, when necessary; and continue, if they are little known, with limited test-trenching of different types of features; and on the basis of this information develop a strategy for larger excavations. If resources are scarce, it may be of value, in relation to large-scale excavation, to concentrate resources on given units each field season. Accumulating detailed information on different types of units this way allows for interesting future comparative analysis.

Probabilistic statistics

In those cases where no visible indications help us identify sites on the surface, systematic test-trenching based on some statistical method may be of relevance for defining spatial distribution. These methods have also been used in other situations, for example when choosing objects of study between large amounts of sites. The permanent use and abuse of these methods allow for some comments on theoretical-methodological problems.

In the existing bibliography there are various presentations of probabilistic sampling (see Shennan 1988). However, there is remarkably little discussion on the fundamentals of the method. The probabilistic method is a classic inductive method, used for inferring something about the unknown on the basis of a small known sample. When selecting a given probabilistic method, it should be kept in mind that there is no men· of free choice, mixing as one pleases. A given method must, if used, be applied systematically throughout a given project. It is interesting to note that many archaeologists of the "New Archaeology" trend, though defending in theory deduction have applied to a great extent inductive statistic methods (including probabilistic sampling and significance tests).

In archaeological practice, the conditions of archaeological materials do not facilitate the application of inductive statistical methods. The factors involved, determining the formation of the (unknown) total archaeological population of each case, are several and very complex. In Sociology, the situation is different since the population is often visible in the present, and it is thus possible to argue on its characteristics in order to choose a suitable method. This does not mean that probabilistic sampling (in a strict sense) is of no use in Archaeology. They can constitute useful tools for archaeological analysis, but only in special cases it will be possible formally to make statistically valid inferences (Doran & Hodson 1975, Cowgill 1977, Madsen 1988).

Deductive-descriptive statistics

The deductive/descriptive methods are, from a statistical point of view, of greater use for Archaeology (see Madsen 1988). Also more complex methods, like the correspondence analysis, are useful for defining correlations between multiple variables (artefacts, bones, macrofossils and so on), in series of given units; they are particularly useful to establish chronologies (Madsen 1988, Hojlund 1988, Bonn archaeological... pp. 267-286) and to establish groups of artefacts, bones etc., representing a function or a differentiated social situation (Bolviken et al 1980, Hojlund 1988, Blankholm 1991 pp. 91-101, Bonn archaeological... pp. 267-286). Formally, the criticism of Albert Spaulding (1977) on deductive/descriptive methods is valid: they do not bring us new information. But, nevertheless, these methods organize the material in complex ways, often almost impossible to achieve manually.

Conclusions of part 2

The delimitation of units of provenience is a fundamental problem. It is of great importance to stress the difference of scale in units of provenience, and to consider the analytic and statistic commensurability of different units.

3. General conclusions

Both on the level of social theory, and in application, the conceptualization of cultural contexts is impossible to manage in NW Argentina. The archaeological material demonstrates a variability that does not allow the separation of well defined cultural contexts. It seems better to orientate archaeological studies to specific defined problems, related, for example, to social, economic or political themes.

A problem of mayor importance are the processes of change in different societies. Approaching this problem, the concept of mode of production seems to be of fundamental importance. Nevertheless, static categories, such as the ideal type proposed by Max Weber, are of great value as operative tools.

The units of provenience in Archaeology are of two types, the minimal delimitation defined in, say, an excavation, and units given a socio-economic content, constituted by several minor units. These latter units are, actually, a sort of ideal types. These types may be defined on the level of the site (a centre?, a village?), or according to elements of a site (a temple?, domestic units?).

To conclude, I propose as a sort of principal objective to archaeologists in future studies to focus on theoretical and methodological problems in passing from the static level of the ideal type to more complex problems related to change

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