

Lasting Alliances and Emerging Competition: Economic Developments in Early Mesopotamia

REINHARD BERNBECK

Freie Universität Berlin, Bitterstrasse 8-12, 14195 Berlin, Germany

Received October 19, 1993; revision received May 4, 1994; accepted May 12, 1994

In this paper, I argue that archaeologists have overlooked variability within the category of "prestate Mesopotamian societies" by focusing exclusively on political organization. If economic and not only political criteria were used to evaluate developments in early Mesopotamia, a different perception of prehistory and history would result. Mesopotamian societies in the 6th millennium B.C. can be shown to be politically "stable" but economically changing. The analysis of economic processes is based on the structural Marxist concept of "modes of production." © 1995 Academic Press, Inc.

INTRODUCTION

Research in Near Eastern prehistory and early history traditionally focuses on two fundamental developments, the neolithic revolution (10th to 7th millennia B.C.) and the emergence of the first states in the 4th millennium B.C. From the first appearance of agricultural settlements to the existence of sociopolitical systems capable of producing and distributing vast surpluses, important developments certainly occurred. Yet there are very few attempts to analyze social processes in this long period. Redman (1978: 188-189) subsumes these societies under the heading "advanced villages." He identifies some differences in their social organization, calling some of them "tribal" and others "chiefdoms." However, he does not provide detailed information about social and economic patterns underlying these differences (Redman 1978: 205-206). For Hole (1987: 30-32) this time range is characterized by a long "village period," differentiated mainly by culture historical but not by structural particularities.

The most commonly used approach for investigating prestate societies is to classify them according to the ideal types formulated by Service (1962) and Fried (1967) in their outlines of the evolution of politi-

cal systems. Lists of traits are developed and schematically applied to archaeological cases. This results in the reification of concepts of political stages and the sterile categorization of whole societies (Kohl 1984: 128-129). One of the basic flaws of concepts like "chiefdom," "tribe," or "state" is that political, economic, and other social institutions are conceived as tied together in such a way that change in one of them leads necessarily to changes in all others (Yoffee 1993). It is undeniable that there are close connections between social, political, and economic structures; they should, however, not be overemphasized. Assuming a certain degree of autonomy of such spheres in the social whole (see Rappaport 1979: 151-152), a way out of the dead end of neoevolutionism is to investigate the development of political, economic, and other structures independently of each other. For example, change in the economic sphere need not necessarily be accompanied by change in the political sphere and vice versa.

In the following discussion, I will show that during the long "village period" in Mesopotamia some fundamental economic developments occurred. Concepts of political anthropology by themselves do not allow us to detect these developments. A specifically economic theory is required

to permit the identification of crucial elements of production, distribution, and consumption. My approach will be based on the theoretical apparatus developed by French structural Marxism. After recent political events, it seems appropriate to comment briefly on the value of Marxism in general as a theory in the social sciences.

MARXISM IN SOCIAL SCIENCE?

In the current political situation, following the dissolution of a form of government in Eastern Europe known as *Realsozialismus*, some have argued that Marxist thought in general is discredited. This perception is based on the misunderstanding that anything labeled "Marxist" can be subsumed under a coherent ensemble of theory and practice for which *Realsozialismus* is representative. Some observers seem to equate a whole range of Marxist theories and their vocabulary with what they know about the political system of *Realsozialismus*.

Certainly, the unity of theory and practice, a basic claim of Marxism in general, has become a problem in light of recent historical developments. The few movements which were successful in installing a "socialist" or "communist" system all failed to ensure the most basic human rights, one of the reasons for their breakdown. However, this depressing state of affairs in the realm of practice does not automatically reflect flaws in the theory. It would be as illogical to argue that systems theory has to be dismissed just because a corporation whose management had applied a systems theoretical approach went bankrupt. A very general theory cannot be dismissed because one of its possible applications failed.

In social science, some nondogmatic strands of Marxist thought have profoundly influenced recent debates. Critical theory is probably one of the more widely influential kinds of Marxism in Anglo-American social science. Its contributions

to a critique of postmodernism (e.g., Habermas 1981) are widely recognized. Here, I am concerned with a different school of thought, structural Marxism. As will be shown below, this school pursues a reading of Marx's major work *Das Kapital* (Marx 1962 [1867]) based on certain assumptions.

Even though I do not deal here with the dialectics between theory and practice, it seems important to mention that the vanishing of *Realsozialismus* supports a very general idea ubiquitous in Marx's own writings, namely that the suppressed will not eternally tolerate their situation. This is a warning as well for industrialized western countries and their relations to the poorer parts of the world: we are not at the "end of history."

STRUCTURAL MARXISM AS A METHOD OF ANALYZING ECONOMIC INSTITUTIONS IN ARCHAEOLOGY

To explain some especially important principles of structural Marxism, some background knowledge about its intellectual history is useful. Structural Marxism is one branch of the many different Marxisms which developed in the course of the 20th century. A common problem with these schools is that most of them pretend to represent the "true" thoughts of Marx himself. The most uncompromising of all these groups was the doctrine of the former Soviet Union and its allies. There, an almost religious dogma was developed whose laws could be memorized from the numerous philosophical dictionaries and other "authoritative" works.

The reason for the development of different strands of Marxism is a simple one. The writings of Marx do not constitute a uniform block which is consistent in itself. Rather, there are substantial differences between the thoughts outlined in the earlier and later works; and even though most Marxists claim to think critically, the words of Marx himself are often regarded

as sacred. The combination of this attitude with Marx's own inconsistencies led to an enormous need for exegesis. As the exegeses took on more and more weight, different lines of interpretation developed into more and more intolerant political and philosophical positions. This tendency appeared as early as the first decades of the 20th century, when Lenin began to condemn tendencies in German socialist circles as "infantile disorders" (Lenin 1969 [1920]), and it was exacerbated by the struggle between Trotsky and Stalin in the 1920s.^{1,*}

Even though structural Marxism is also a school of Marxist thought, it has some peculiarities which set it apart from other Marxisms and which at the same time make it a goldmine of ideas for anthropological archaeology (Hart 1983: 125–126). The main ideas of structural Marxism were formulated by the French philosopher Althusser and his associate Balibar. In the following I will focus on one of the major aspects of this work, the "mode of production" concept.

For his analysis of capitalist society Marx used the term "mode of production." Also, in some writings he—and Engels—suggested that there existed several different modes of production prior to the capitalist one. In the preface to one major work, four such modes of production are mentioned: the asiatic, antique, feudal, and bourgeois modes. Engels used Marx's notes on Morgan's (1985 [1878]) *Ancient Society* to construct a much more elaborate evolutionary sequence (see Krader 1972). It is clear from Marx's writings that he did not consider the historic sequence outlined by himself as definitive (Hobsbawm 1964: 18–20).

The unclear character of some of Marx's concepts of mode of production has led to tragic consequences. This is especially true

for the asiatic mode of production. Under Stalin's influence, at a conference in Leningrad in 1931, the concept was declared to be incompatible with Marx's writings. Following Stalin's own writings (1947: 664), China and India were to be described as "feudal" societies in their precapitalist or presocialist state. Intellectuals who did not follow Stalin's ideas paid dearly—with their lives (Chesneaux 1969).

The problems with Marx's concept of modes of production have at least three sources. First, Marx did not differentiate between empirical and theoretical categories in his description of modes of production (Currie 1984). He always explained theoretical concepts by way of concrete examples. In the characterization of an "antique" mode of production, for example, it remains unclear whether the attributes listed pertain only to the special case described or if they are presumed to be typical for all societies with an "antique" mode of production. Second, Marx's knowledge of historically and ethnographically known societies was of course dependent on the current state of research at the time. Ethnographic and historical knowledge has changed dramatically in the past 100 years. Morgan's writings, one of Marx's and Engels' major sources, are outdated by modern standards of cultural anthropology. Third, the scheme set up by Marx includes an ideology of progress which is mainly based on technological developments. Evolutionary stages are conceptualized as modes of production. One of the fundamental criteria in Marx's system of values is the reduction of the limitations imposed by nature on human society. Marx directly connects this to progressive changes in the forces of production (Heller 1972). This idea of progress which underlies much more than just Marxist theory has been cast increasingly into doubt with the recognition that industrial systems, whether socialist or capitalist, destroy large parts of the natural envi-

* See Notes section at end of paper for all footnotes.

ronment and therefore threaten to eliminate human life itself.²

Structural Marxism has the potential to deal with these three problems inherent in Marx's writings. Althusser and Balibar point out that while Marx explains his theories through the use of historical examples, neither Marx nor Engels wrote an explicit abstract outline of a theory of modes of production. However, in their writings on the capitalist mode of production, such a theory is implicitly formulated. It is therefore possible to extract the abstract principles from the concrete examples. However, this is only possible if one finds a way to deal with the discrepancies in the earlier and later writings of Marx. Althusser's solution to the problem is to consider the main work of Marx, namely *Das Kapital* (Marx 1962 [1867]), and some of his other late writings like the *Grundzüge* (Marx 1983 [1939]). Balibar's section on "The Basic Concepts of Historical Materialism" in *Reading Capital* (Althusser and Balibar 1979: 199–308) consists of a generalization of the structure of modes of production.³ With this abstract concept, the sequence of modes of production as established by Marx and Engels, with its undifferentiated use of concrete and general categories as well as its inadequate historical and anthropological knowledge, can be reconsidered. Balibar's model contains criteria through which modes of production in a particular society can be analyzed and compared to those of other societies. This offers the possibility of identifying previously unrecognized modes of production.

Cultural anthropologists, especially in the French tradition, have tried to conceptualize a number of different modes of production which are not included in Marx's crude original scheme. They identified a colonial, a lineage-based, and other modes of production (Foster-Carter 1978; Jewiewicki 1981: 94–98; Meillassoux 1981; Terray 1972). With these new concepts, the traditional sequence of very few modes of

production had to be abandoned. More importantly, though, the associated idea of a progressive development toward capitalism and finally communism changed from a subject of belief to a subject for discussion (Elliott 1993: 236). Empirical findings on hitherto unrecognized modes of production allow us to reconsider the supposedly unilinear economic development of societies. They can be used to build a critique of the basic outline of Marx's evolutionary theory and its underlying values.⁴ The idea of multilinear development includes the possibility of nondirectional changes and vitiates the evaluation of modes of production as either "progressive" or "retrogressive."

A last and very important point is that a structural Marxist approach can be used to critique principles of historical materialism. Balibar's model of modes of production is in accordance with traditional Marxist schools insofar as modes of production consist essentially of "forces of production" and "social relations of production." According to traditional Marxisms, forces of production always develop faster than relations of production, and mounting tension, produced by the increasing discrepancy, is finally released through a "revolution." New relations of production which are in harmony with the already developed forces of production are thereby established, and the new combination of forces and relations of production defines the new mode of production. Popper (1964) calls this a "historicist" model which cannot account for the real course of human history. Balibar's structural model of modes of production allows us to reconsider these "laws" of historical materialism. Since forces and relations of production can be analyzed empirically, there should be a multiplicity of cases in which differential development of forces and relations of production occurs. In this way, predeterminations of a historicist character are avoided.

A STRUCTURAL MODEL OF MODES OF PRODUCTION

Before going into detail, a word is necessary concerning Marxist terminology. Marx formulated his thoughts without giving particular attention to definitions or to a vocabulary which is easy to comprehend. This problem has been exacerbated by clumsy translations into English. This is one of the reasons why Marxist literature is often so difficult to digest. A second reason is that in western industrialized countries Marxist vocabulary has a priori negative connotations. In the following section I cannot avoid using a certain amount of this jargon. On the other hand, I try to alleviate the problem by explaining concepts through the use of examples and by translating these terms into a more understandable language.⁵ The terminology is straightforward insofar as for the more abstract economic concepts the word *production* is used, as in relations of production, whereas for the more concrete concepts the word *labor* is used, as in means of labor (Fig. 1).

As mentioned already, modes of production consist of forces and relations of production. According to Balibar's reading of *Das Kapital*, forces of production are made up of the organization of labor⁶ and the means of production. All persons involved in the processes of the production of an object can be considered to belong to

the organization of labor. What is important for the organization of labor is not only the number of people involved in a production process but also the kinds of cooperation present in a society. Working groups can be nonhierarchical or hierarchical. A working group in which all members perform the same task simultaneously is defined here as nonhierarchical. A good example from ethnographic contexts is Malinowski's description of communal work in gardens on the Trobriand islands (Malinowski 1961: 159–162). Where different tasks are performed by different members of a working group at the same moment, the result is often a hierarchical structure of cooperation.

Means of production contain on the one hand objects of labor and on the other means of labor. Any part of nature which is transformed into an artifact is an object of labor at the time of transformation. It may then immediately be consumed—as in the case of unprocessed food—or it may be used to produce other objects of labor, in which case it becomes a means of labor. Means of labor are not only all kinds of tools but also water, land, and other such categories which are not necessarily produced by human beings.

In the triangle of organization of labor, means of labor, and objects of labor, the means of labor play a prominent role. This

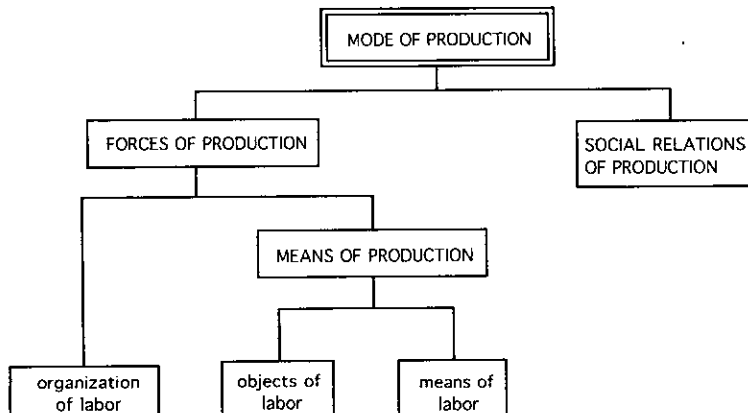


FIG. 1. The structure of modes of production.

is so because they determine to a certain extent the organization of labor as well as the character of the object of labor. The mechanization of agriculture, for example, resulted in a dramatic decrease in the need for labor in the primary sector. Fully mechanized farms are no longer organized primarily by family structures but by purely economic structures of employer and employee (Bergmann 1990: 52–55). This is a change in the organization of labor. Plants produced on such mechanized farms, i.e., the objects of labor, have to be much more standardized in order to treat and harvest them with machines. The means of labor—the machines—therefore put a strong pressure on artificial selection of plants with certain attributes and this changes the appearance of the objects of labor.

Social relations of production are the other major part of any mode of production. In the traditional Marxist literature, these relations are mostly reduced to property relations. However, according to Balibar, they include any relations between persons involved in the production, distribution, and consumption of a product (Althusser and Balibar 1979: 232–233). This amounts to a conceptual problem since the organization of labor also consists of relations between people, namely forms of cooperation. In this respect, forces of production and social relations of production seem to overlap. For analytical purposes, cooperation in work should be separated from other social relations of production. Cooperation is mainly a characteristic element of the organization of labor, but it is also of relevance for the analysis of the social relations of production.

What are the archaeological correlates for these elements of modes of production? Objects found in an excavation can belong only to the sphere of the means of production. This does not imply that any object is either an object of labor or a means of labor. For example, a kiln is a means of labor because it is used to pro-

duce other objects (ceramic vessels or metal objects). At the time the kiln itself is built, though, it is an object of labor. Therefore, all intentionally produced means of labor have to go through a stage in which they are an object of labor.⁷ One part of the objects of labor is directly consumed. Harvested grain which is directly consumed never becomes a means of labor. However, that part of the grain which is kept as seed for the future becomes a means of labor. The consequence of this double aspect of most humanly produced objects is that in an archaeological analysis one has to take into account both of these perspectives. One goal should be to reconstruct as much of the means of production as possible.

In addition to the directly observable objects and means of labor, certain attributes of objects of labor allow us to conclude the existence of means of labor. An obvious example is wheel-finished vessels. Various characteristic traces on vessels attest to the existence of the potter's wheel in the society where such ceramics are found. Objects of labor can also be reconstructed from characteristics of the means of labor. From casts, it is possible to reproduce the objects even if these were not preserved. Another archaeologically important category of objects is not included in the structural model of modes of production. It is what can be called "labor byproducts" or residues and consists of objects such as crucibles and splinters from the use of borers (see Tosi 1984: 25, 35). Wasters, for example, may contain information not only on certain attributes of the objects of labor, such as kinds of alloys of metal objects, but also on the shapes of means of labor, i.e., the crucibles.

An important part of the forces of production which can only indirectly be approached is the organization of labor. Certain kinds of means of labor allow for only a limited number of possible forms of cooperation in production processes. For ex-

ample, spindle whorls are objects which can be used by only one person at a time. The same is true for sickles and arrows. This does not mean that there was no cooperation at all involved in the use of such instruments. At least today in the Near East, harvesting with sickles is mostly done by several people doing the same kind of work at the same time and without much hierarchy.

Large public buildings are another sort of evidence for forms of cooperation and thus for the organization of labor. It is clear that such constructions could not have been built by a single person nor by a group working on an ad hoc basis. For many ancient monuments, such as pyramids, palaces, and temples, planning and special skills are needed which almost invariably involve a hierarchy in the organization of labor. From archaeological data alone it is impossible to specify the number of different levels in such a hierarchy. Here, as in most other cases where forms of cooperation in an archaeological context are concerned, the recourse to ethnographic analogies is necessary.

This leads to another problem: for a long time, cultural anthropologists showed no interest in the "anthropology of work." Only in the past 10 years or so has there been a growing interest in the relations between the organization of production and its results (Applebaum 1984).⁸ In French anthropological literature, such ideas have a longer tradition. Already in the 1940s, Leroi-Gourhan (1971, 1973) systematized work by considering the mechanical aspects of the means and objects of labor. Later, Cresswell explicitly formulated a concept for an anthropology of work (1972, 1990). According to Cresswell, the production of an object can be understood as a chain of sequentially or simultaneously executed tasks, called the "operational sequence" (see also Lemonnier 1992: 25–37). The emphasis is put on the relationship between tools, working people,

and transformed material as well as on social structures determining the distribution of tasks (Cresswell 1990: 42–48). The technology of a society, according to these ideas, cannot be understood by classifying different kinds of objects, but only by analyzing actual processes of work. Since these early formulations, the concept of the operational sequence was mainly—and with great success—applied to the production of lithic tools (Pelegrin et al. 1988; Pigeot 1990). Here, cooperation plays almost no role. Only very recently have there been attempts to apply the concept to production sequences in which cooperation between several individuals is involved (see contributions in Balfet 1991).

In the case study outlined below, I follow the general ideas of the concept. Each production sequence is analyzed according to at least four criteria. The first is the number of different tasks involved in the production of an object. There is no independent definition of what constitutes a task except that it consists always of one or more gestures. Instead, the identification of different tasks in specific operational sequences is dependent on the goals of the analysis. There is a wide span from the inclusion of the simplest gestures as single tasks to much more coarse-grained schemes in which the smallest analytical units of an operational sequence are complex sets of gestures (Lemonnier 1992: 35–38). The second criterion for the analysis of operational sequences is the number of people involved in each task. The third is what I call the degree of repetitiveness, i.e., how often the same task is repeated in an operational sequence. Repetitiveness often consists of a circle in the sequence. A number of tasks is performed over and over until the object enters a stage which requires qualitatively new tasks to be performed. The fourth criterion is the number of different tasks executed simultaneously. Simultaneity of tasks means that at some points the operational sequence has sev-

eral potentially parallel "subsequences" which necessarily converge to a single sequence toward the end of the production process.

One of the advantages of the concept of operational sequence lies in the comparability of different operational sequences used in the production of the same kind of items. In this way, the forces of production of different societies can be directly juxtaposed. For such comparisons, basic measures of the "complexity" of operational sequences are desirable. The number of different steps necessary to produce a single item, from procurement of raw material to the finished stage, gives a first approximation of the organization of production. For the other three criteria, similarly straightforward measures can be developed. It is possible to calculate the average number of people involved in each task. The higher the average number of people involved, the greater the possibility of a complex organization of labor. High numbers of repeatedly executed tasks are generally a sign of a comparatively less complex organization of labor because the number of working people can be kept low and the time required for the performance of a task can remain very restricted.⁹ Degrees of repetitiveness can be expressed by dividing the number of repeated tasks by the total number of tasks in a work sequence. In contrast, a high number of simultaneously performed tasks indicates a relatively complex organization of labor. The sum of simultaneously executed tasks relative to the total number of tasks can serve as a measure of the degree of simultaneity in different operational sequences.

Some aspects of this approach, such as the minimal number of different production steps in a productive process, are inferable by purely archaeological means. Others, like the relations between people involved in these processes, can be reconstructed only by the use of analogies. In many cases, it seems to be impossible to

ascertain with any degree of confidence whether one task was, for example, executed by a single person repeatedly or by two or more persons at the same time. For the archaeological examples outlined below, I therefore refrain from the use of numerical indices as measures of complexity of operational sequences. For the purpose of the case analyzed here, a simple description or visual comparison of schemes of such sequences is sufficient to recognize essential differences in complexity.

In the concept of the operational sequence, all three elements of the forces of production play a role. The object of labor is the item whose manufacture is reconstructed. It is the result of a sequence of tasks. Means of labor are important in almost all such operational sequences because the production of most objects is dependent on the use of tools, land, and other movable or immovable artifacts. These have to be produced in advance or at the same time as certain other tasks, which means that their production has an influence on the length or the complexity of the operational sequence. As was pointed out already, the organization of labor is evident in such sequences in several ways. In addition to the number of people involved in each task, degrees of repetitiveness and simultaneity of tasks all belong to the sphere of the organization of labor.

For the analysis of a whole mode of production, it is important not to restrict oneself to just one kind of material (like ceramics, lithics, or architecture) but to consider all recoverable aspects of the organization of labor. It can be assumed that the productive sphere in a specific society always has a certain coherence but that there will also be variations of the underlying cooperative patterns. One of the first goals in the analysis of the organization of labor is therefore to look for general trends in cooperation.

Even more problematic than the analysis

of organization of labor is the reconstruction of the social relations of production. In Marxist archaeological literature this term almost always means relations of property. One major problem is that such relations cannot be analyzed archaeologically. Mostly, they remain a phenomenon artificially imposed on the data. The most commonly used source is Engels' essay (1905) in which he tried to sum up Marx's excerpts from Morgan's *Ancient Society* (see Krader 1972).

However, if archaeological correlates for social relations of production cannot be devised, the whole concept of modes of production loses its value. As was mentioned above, the advantage of a structural model of modes of production is that the dialectical relationship between forces and relations of production is something which can be discussed and is not treated as an invariant relation. Critical research along such lines is only possible if means are developed to explore the social relations of production empirically, independent from an evolutionary theory which postulates a predetermined relationship between forces and social relations of production.

It is not Marxist-inspired archaeology which can be credited with having made progress on this subject. Rather, positivist processual archaeology has produced some major works which deal with the problem of social relations of production (Saxe 1970; Goldstein 1981). The propositions and hypotheses advanced by processualists depend mainly on the analysis of mortuary data from which ideas about property relations are derived. Other possible archaeological correlates for social relations of production will be suggested below.

To sum up, the theory of modes of production as developed by structural Marxism is important in several ways. It preserves a general strength of Marxism, the insistence on the profoundly social character of the economy and of production in

particular. At the same time, it is much more flexible than most strands of historical materialism with their law-like assumptions. The development of an abstract concept for the analysis of processes of production, implicit since the publication of *Das Kapital*, is another achievement of the theory. In the following, I will illustrate the utility of this concept in a particular archaeological case from the ancient Near East.

THE CASE OF 6TH MILLENNIUM MESOPOTAMIA

The early Mesopotamian Hassunan and Samarran societies¹⁰ are an example of two groups with different modes of production. In traditional views which compare "cultures" in terms of their respective objects of labor, i.e., their products, these two societies are often considered relatively similar to each other. Mellaart for example, after having pointed out some differences in terms of material culture, states that the Hassunan society can be regarded as the "poor relation" of Samarran society (Mellaart 1975: 149). People were living in small villages without apparent internal hierarchies. Architecture was simple and built out of the locally available material, mud. Three techniques of pottery decoration occur in both societies: incised, painted, and a combination of both. The range of lithic tools is comparable, too. Subsistence was based on agriculture and the herding of medium-sized animals, mostly sheep and goat. In addition to similar products, material correlates for the political structure of Hassunan and Samarran societies—settlement systems, house forms, or grave goods¹¹—reveal no major differences either. They indicate a basically egalitarian system in both cases. It will be shown below that the main differences are situated in the economic sphere, i.e., in forms of cooperation, in means of labor, and in the social relations of production.

Hassunan society, named after the site where it was first identified, consists of a large number of settlements in the region of Mosul in northern Iraq and south of the Jebel Sinjar range (Fig. 2). The few C^{14} -determinations available suggest a dating in the late 6th millennium B.C. (Bernbeck 1994: Appendix A).¹² Important sites are Tell Hassuna (Lloyd and Safar 1945), Yarim Tepe I (Merpert and Munchaev 1973,

1987), and the somewhat earlier Umm Dabaghiyah (Kirkbride 1982). The Samarran material culture was first identified by Herzfeld (1930) during his excavations at the Abbasid city of Samarra on the middle Tigris. Subsequently, two other places, Tell es-Sawwan and Baghouz, became the best known sites of this society (Yasin 1970; Breniquet 1992; Mesnil du Buisson 1948). Absolute dates for the Samarran fall

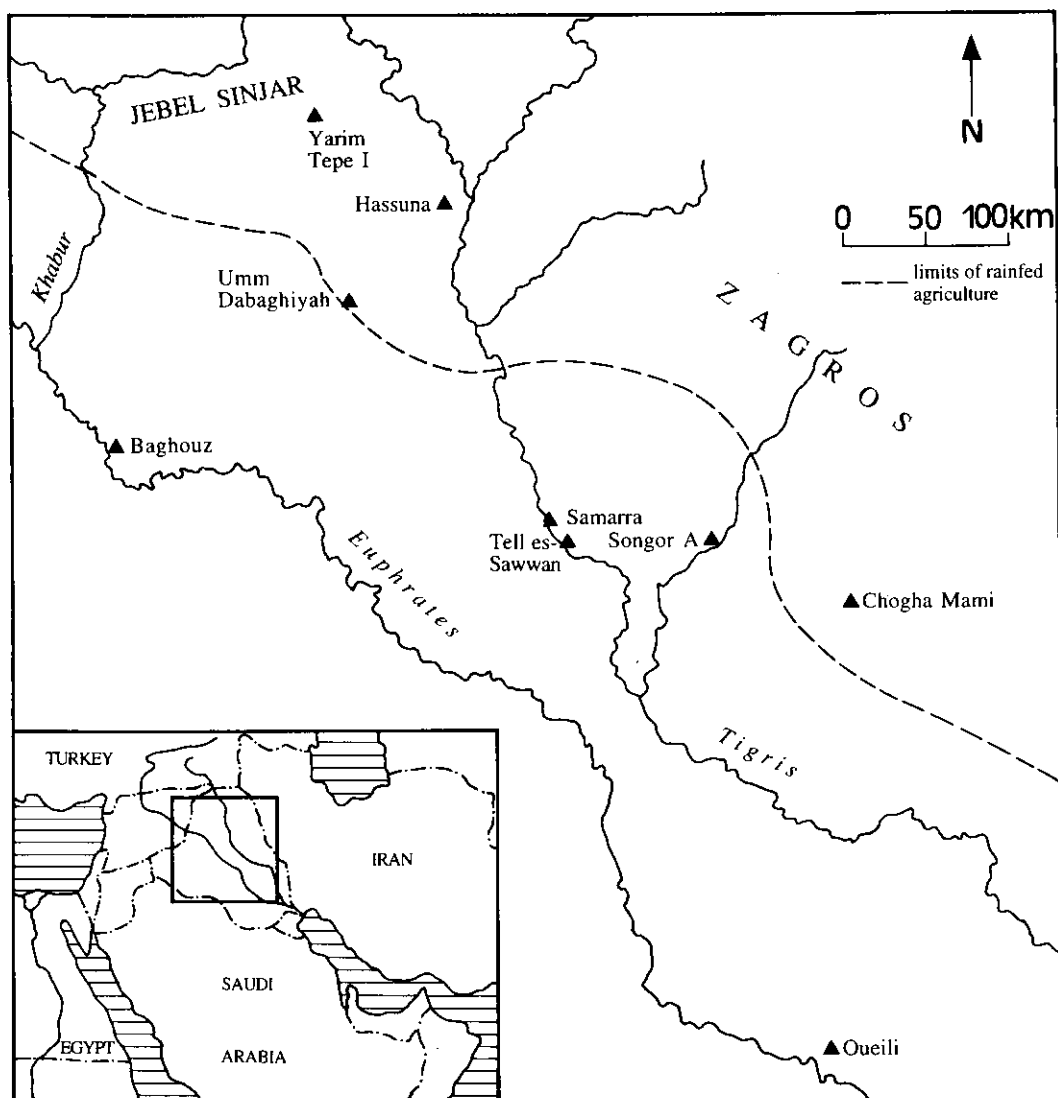


FIG. 2. Map with sites mentioned in the text.

into the latest third of the 6th millennium B.C. Related to Samarran material culture, but perhaps somewhat later in date are the sites of Songor A and Chogha Mami in the Zagros foothills (Kamada and Ohtsu 1981; Oates 1969).

Both societies are defined archaeologically by a single category of artifacts, decorated pottery vessels. Such a definition is unsatisfactory because individuals or whole groups never define themselves through a single category of artifacts alone. Nevertheless, the distinction holds because the Hassunan and Samarran societies show several other fundamentally different characteristics both in their material culture and their structures. One of the most important other differences between these societies originates from their natural environment. Hassunan sites are today within regions where rainfed agriculture is possible, whereas most Samarran sites are clearly outside of this range (Fig. 2). Paleoeological work indicates an even slightly drier climate in neolithic times (Bottema 1989: 14).

In order to get an idea of the forces of production in these societies, I have tried to reconstruct operational sequences for several categories of archaeological materials for both societies. It can be demonstrated that for most processes of production, people of the Hassunan society had simpler forms of cooperation and means of labor. For this discussion, I restrict the differences in means of labor between the two societies to three examples, building material, kilns, and agricultural devices.

Construction of Houses

Houses in Hassunan villages were constructed of pisé, those in Samarran villages of mud brick. Pisé constructions are often made without the benefit of any casing. The raw material is extracted from near the future house, because the mud must be

brought to the building site in wet and shapeless form, being heavy and difficult to transport. The mud is then set in layers of approximately 30 to 50 cm height. Between the setting of two layers a certain amount of time, often a day, must pass to ensure that the lower layers are not deformed by the weight of newly constructed upper ones (Wulff 1966: 108). It is therefore not practical for large numbers of people to contribute to the building of a pisé house (Fig. 3). This is confirmed by observations in the Near East today. In the literature, there is rarely mention of more than one or two persons involved in the construction of a pisé building. Neynaber (1920: 1) stresses that even for large-scale buildings the labor power is kept at a minimum if the building material is pisé. Work is repetitive because the same sequence of steps is executed for each layer of the walls.

Construction with mudbrick follows a different logic. First, means of labor not necessary for pisé construction such as brick molds must be manufactured. The operational sequence is therefore longer. Second, the organization of labor is potentially more complex and less repetitive. Bricks can be formed and dried relatively far away from the place of construction because it is easier to transport the lighter, hard material. Several steps of work can be—and often are—done at the same time. The construction of walls can begin as soon as some bricks are dry (Fig. 3). Alternatively, it is possible to form all the bricks necessary for a building and then do the construction work itself. The construction of walls does not require an interval in which the building material dries. In practice, even though the number of different production steps in the operational sequence is larger, a building may be finished in a much shorter time than is the case with pisé. This is so because the degree of simultaneity of tasks is potentially

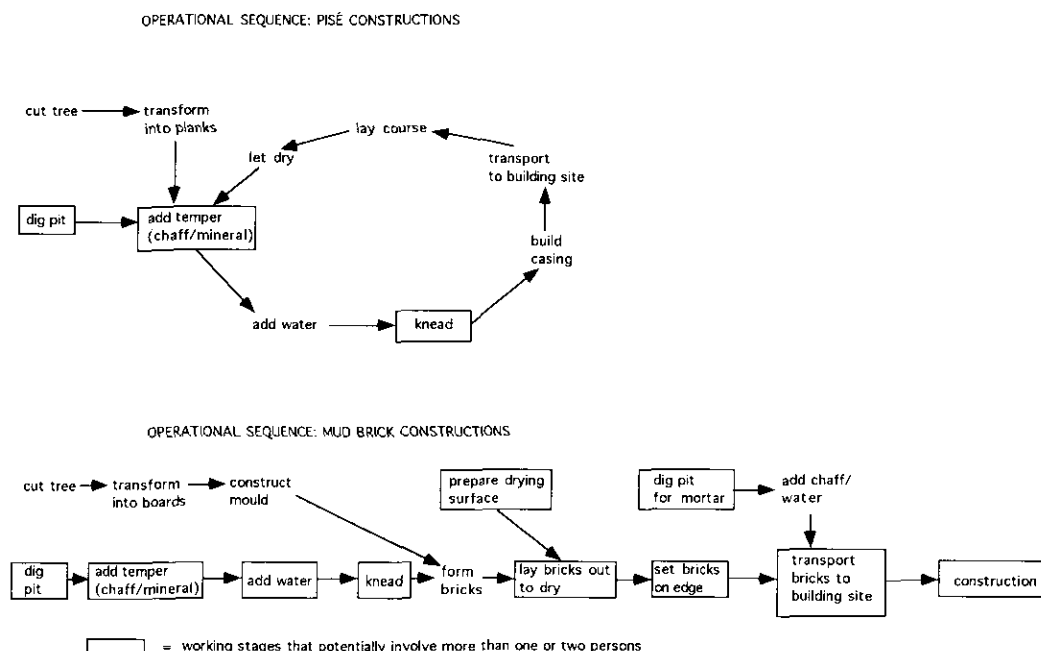


FIG. 3. Comparison of operational sequences for the building of houses with pisé and sun-dried bricks.

higher and the degree of repetitiveness lower than in pisé constructions.

Ceramic Production

Ceramics of Hassunan and Samarran societies are stylistically very different, but they are quite similar in terms of paste, basic repertoire of shapes, and other technological aspects such as firing temperature. From several sites, there is evidence of the use of kilns. Here, only those firing installations are taken to be kilns which are clearly associated with ceramic wasters or whose shape—separate firebox and firing chamber—suggests such a function (Delcroix and Huot 1972; 79–80, Fig. 9, Type II A).¹³ Kilns differ significantly in size. Examples in Hassunan villages have an average estimated volume of .37 m³, those in Samarran villages of 2.10 m³ (Bernbeck 1994: Table 93). From contemporary ethnoarchaeological research in Mesoamerica (Sheehy 1988), it is clear that the amount of

fuel needed per unit of clay pots (measured in kg) decreases with the size of the kiln. Based on Sheehy's data, the estimated weight of ceramics filling 1 cubic meter of kiln volume is ca. 198 kg.¹⁴ Furthermore, kilns with larger volumes have a different clay:fuel ratio than small kilns. This ratio does not, however, decrease in a linear fashion with increasing kiln size, but exponentially. Again using Sheehy's data (1988: Table 1), the estimated clay:fuel ratio for the average-sized Hassunan and Samarran kilns were computed (Table 1).

From these data, the amount of fuel necessary for one kiln load can be estimated. Using a figure of approximately 30 kg per load carried on a person's back, Hassunan kilns need between 1.0 and 1.8 such loads. For Samarran kilns, a minimum of 3 and a maximum of 7 loads carried could be estimated, the mean being 4.3 loads, and whereas the average number of vessels fired in a Samarran kiln is more than 7 times higher than that of a Hassunan kiln,

TABLE 1
Kiln Size, Fuel Load, and Efficiency for Hassunan and Samarran Kilns

	Average kiln size	Clay load (in kg)	Clay:fuel ratio	Fuel per kiln load (kg)	No. of fuel loads carried	Vessels fired (2 kg per vessel)	Vessels per fuel load carried
Hassuna	.37	73.3	1.54:1	47.6	1.5	37	24.7
Samarra	2.10	415.8	3.24:1	128.3	4.3	208	48.4

the amount of fuel which must be collected is only 2.8 times higher (Table 1).

Fuel gathering is one of the more tedious tasks of ceramic production (Rice 1987: 174–176). The data from the Hassunan and Samarran societies suggest that rationalization in this sphere of activities was of concern from very early on. It seems that kiln size in the Hassunan villages was limited by the amount of fuel an average person could gather and carry on his or her back. This means also that one kiln load consisted of a very limited number of vessels. If a large number of vessels were formed and readied for firing before completing this task, a certain amount of repetitiveness would be built into the operational sequence. If the number of vessels produced was limited by the size of the kilns, the repetitiveness would be even greater since the preceding tasks would also be performed repeatedly, but with interruptions. The much larger Samarran kilns suggest that either one person went several times to gather enough fuel for one firing or that several persons did the same kind of work at the same time. In light of other evidence, especially the larger size of Samarran households (see below), the latter interpretation seems more convincing. The organization of labor as well as the means of labor in the realm of ceramic production were certainly different in these two societies.

Subsistence Production

According to present knowledge, in many if not all Samarran villages agricul-

ture depended on a simple form of irrigation. This is suggested by the analysis of seeds recovered from Tell es-Sawwan (Helbaek 1964), but also by a small irrigation ditch found in excavations at the site of Chogha Mami (Oates and Oates 1976). If we use modern climatological patterns, Samarran villages invariably lie outside of the geographical range in which rainfall is sufficient for rainfed agriculture (Fig. 2). In contrast, available palaeobotanical data for Hassunan villages point to rainfed agriculture.¹⁵ Even though the working of fields in the northern Hassunan region involved a high degree of labor investment, this was certainly higher in Samarran contexts. Canal construction, maintenance, and clearing all presuppose more time spent with the production of means of labor.¹⁶ Before a canal can be built, a suitable piece of land has to be found which is flat enough to be irrigated. Otherwise, terracing work is necessary prior to canal construction. These tasks extend the operational sequence of agricultural work considerably. Furthermore, fields have to be leveled on a yearly basis to prevent erosion, and at the time of irrigation constant control of the waterflow is necessary. In irrigated fields the amount of weeds is much higher, so the time spent weeding increases too (see Charles 1990: 52–54).

The above-mentioned tasks accompanying irrigation agriculture support Bose-rup's (1965) hypothesis that intensification of agriculture implies an increase in workload/hectare/year. For the analysis of a mode of production, though, consideration of workload/hectare/year is inappro-

priate. Especially in semiarid environments like Mesopotamia, the amount of land per person which must be tilled cannot be based on the *average* amount of harvested grain per hectare. Modern data suggest that the southern fringes of the Sinjar range where most of the Hassunan villages lie are the very edge of a region where rainfed agriculture is possible. Local droughts are a constant threat (Ergenzinger et al. 1988: 110–111). One strategy for averting risk in the zone of rainfed agriculture may therefore consist in the tilling of a larger amount of land than necessary in the average year. This is called by Halstead (1989: 68–70) a “normal surplus” production. In case of a drought, the larger cultivated surface may yield an adequate crop. In years when smaller plots would have been sufficient for the individual household, it can be expected that there would always be some households in the same village which did not produce enough for their own needs and to whom this surplus could be transferred. As similar processes in present-day societies in Africa show, this is not just a romantic picture of an ultimately altruistic community (Lewis 1981: 63). In a semiarid zone where agriculture depends on rainfall, risk avoidance forces the individual household to cultivate more land than needed in the average year.

Ecological conditions for Samarran villages are different. Because of insufficient rainfall, irrigation is a condition of survival for all known Samarran villages. The preparation of irrigable land is a major labor investment, but once an irrigation system is set up it has an advantage over rainfed agriculture: it is much less dependent on the vagaries of annual rainfall. Lower risks permit the restriction of the amount of cultivable land necessary for subsistence. Even though the cleaning of canals and the control of irrigation processes may involve more work *per hectare* than in rainfed agriculture, the amount of agricultural work

per person may be lower due to the fact that the long-term predictability of the amount of harvested grain per hectare is higher.

The three examples of productive processes examined above show that work in Hassunan society was generally more repetitive and less complex than in Samarran society. An examination of village plans permits deeper insights into the organization of labor as well as social relations of production. We shall see that the more complex forms of cooperation in Samarran society are associated with more fragmented social relations of production.

Relations of Production

Architecture in Hassunan villages is agglutinative; i.e., houses are built directly against each other. The outer walls of the neighboring compound could be used as an integral part of a new building (Fig. 4). There is no standard plan for houses. Public space between compounds was used intensively for a number of activities like storage, processing of harvested grain, and firing of ceramic and probably other objects. That public space was an important place for all kinds of activities is also documented by the fact that such surfaces were sometimes carefully plastered, whereas floors inside the houses were left unplastered (Merpert, et al. 1978: 28). Houses have more than one entrance, suggesting that the separation between a public and a private sphere was not strongly marked. In Samarran villages, on the other hand, houses have a standard plan. Walls of compounds do not touch each other and buildings normally have only one entrance (Fig. 5). This spatial arrangement may be interpreted as another expression of greater social distance between different households and an indication of a strong demarcation between public and private spheres. Such an interpretation is supported by the fact that there are no indications of the occurrence of many activities

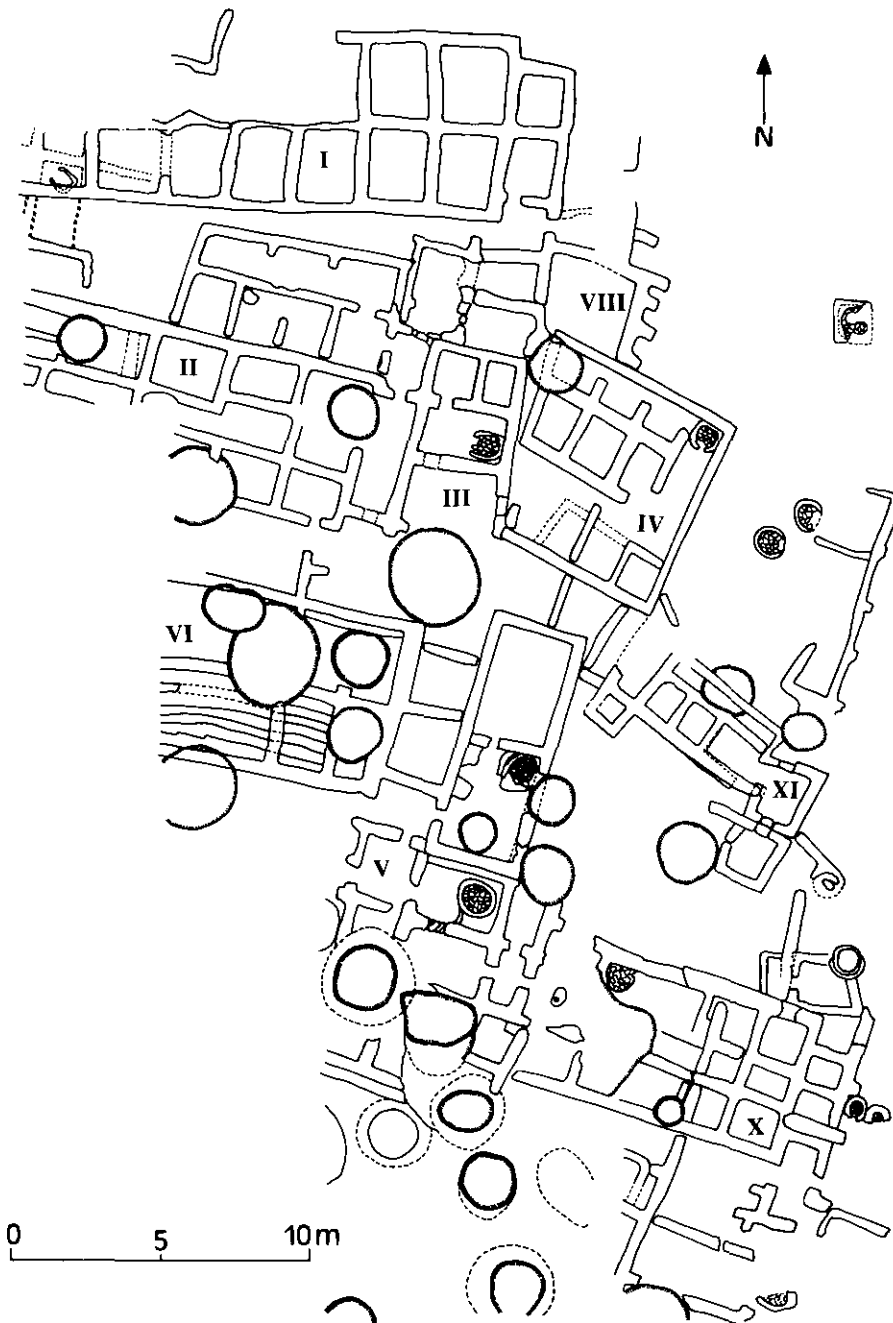


FIG. 4. Plan of Yarim Tepe, Level V (after Merpert and Munchaev 1973: Pl. XXXVII).

in the public spaces between compounds. Even kilns for firing ceramics are confined within walls, and the only documented installations in a public space are bread ovens

at the periphery of the village (Abu es-Sooif 1971: Pl. I). Also, houses are of a much larger size than in contemporary Hassunan villages, and their floors are

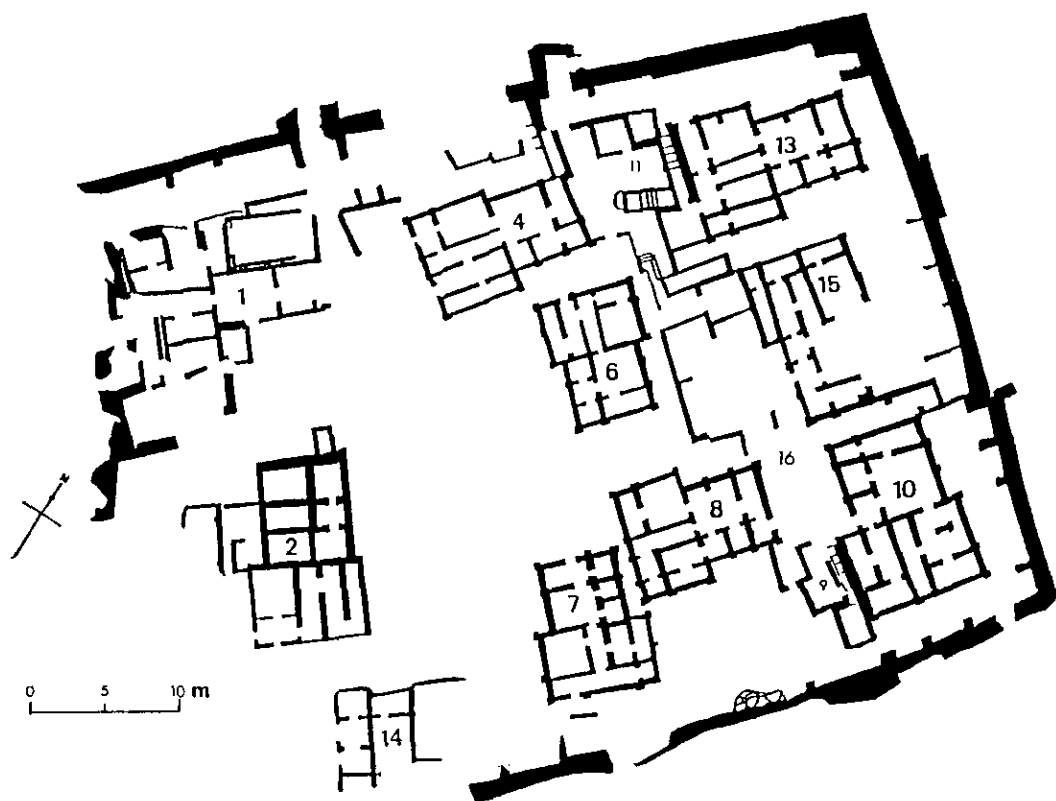


FIG. 5. Plan of Tell es-Sawwan III A (after Yasin 1970: Pl. I).

carefully plastered (Wahida 1967: 170–171).

Another important difference between Hassunan and Samarran villages are the kinds of public buildings present. In every Hassunan village in which a relatively large area has been excavated, multipurpose storage buildings were discovered. The most striking examples come from Umm Dabaghiyah (Kirkbride 1982: Fig. 2). In Yarim Tepe I, similar structures, consisting of two rows of small cubicles, were found (Fig. 4, house I). Analogies to modern societies suggest that these structures were used at least in part for storage of grain (Hall 1970: 163–165, Fig. 39). In Samarran contexts, such buildings were not found despite the complete excavation of the village of Tell es-Sawwan and large-scale excavations at other sites, including

Chogha Mami.¹⁷ Instead, small annexes like Nos. 9 and 11 for level III A at Tell es-Sawwan (Fig. 5) suggest that storage of harvested grain took place in each compound separately, another indication of greater social distance between households.

In contrast to Hassunan sites, in almost all Samarran ones remains of structures with a defensive character were found. Tell es-Sawwan is surrounded by a fortification wall and a ditch (Fig. 5). In Chogha Mami and Songor A, a tower-like structure and parts of a large wall were discovered (Oates 1969: 121–122; Kamada and Ohtsu 1981: Fig. 25). One can therefore conclude from a comparison of village layouts that social distance was not only greater within Samarran villages but between them as well.

These major differences can be at least partly explained by social relations of production. Judging by the area of compounds, Hassunan households had fewer members than Samarran ones (Fig. 6).¹⁸ Ethnographic examples suggest that such size differences result from the underlying kinship structures (Bernbeck 1994: 311). Compound size can therefore be used as an archaeological correlate for social structures. In the following discussion, my hypothesis is that the Hassunan households consist of stem families, whereas those of the Samarran society have the structure of extended families. These two different kinds of families undergo different family cycles (Lee and Gjerde 1986).¹⁹ For the present problem, the cyclical changes of what Sahlins (1972: 89–92) calls the consumer/worker ratio (hereafter *c/w* ratio) in these two kinds of families are of interest. This *c/w* ratio is made up by the total number of consumers per household divided by the number of persons able to work.²⁰ Differences in family cycles between stem families and extended families can be expected to have an effect on the *c/w* ratios.

With available archaeological data, it

seems impossible to set up more than a very tentative model for the Hassunan and Samarran societies. This is so because there are almost no demographic data from skeletons. Life expectancy, fertility, and mortality rates cannot be provided by the archaeological documentation. The model of family cycles and associated *c/w* ratios is therefore entirely based on ethnographic evidence. For this purpose, I use data from groups living in modern Iran (see Bernbeck 1994: 316–322, for more detail). Future archaeological work should enable a better adjustment of the model to the conditions of the late 6th millennium B.C. It is important, however, to note that the same demographic parameters were used for the calculation of both stem and extended family cycles.²¹ The model can be kept relatively abstract. For example, it is not necessary to specify the descent or residential patterns of the respective societies. For stem families, it is supposed that the first offspring stays in the compound, whereas the younger ones have to move out by marrying into other families or by setting up new compounds. For extended families, it is assumed that two of the off-

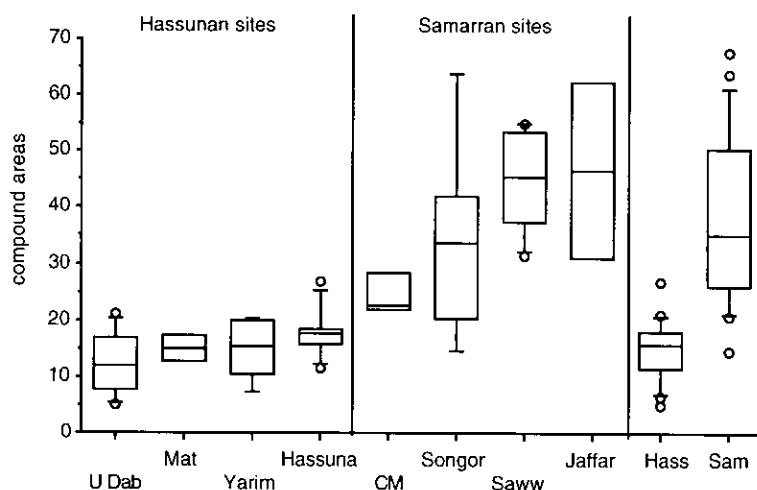


FIG. 6. Box plot of compound areas for Hassunan and Samarran sites (U Dab, Umm Dabaghiyah; Mat, Matarrah; Yarim, Yarim Tepe I; CM, Chogha Mami; Songor, Tell Songor A; Saww, Tell es-Sawwan; Jaffar, Jaffarabad; Hass, compound areas of all mentioned Hassunan sites; Sam, compound areas of all Samarran sites).

spring stay in the compound and form an extended household. These two subunits in a household can be similar in their internal structure to stem families, but an important difference is that the respective heads of the subunits can be expected to be of different ages. Therefore, the stem family-like subunits which constitute an extended household are in different stages of a subunit cycle. Following Chayanov's work (1966), yearly *c/w* ratios can be simulated for both kinds of households. According to the model, stem families go through relatively long cycles with a favorable *c/w* ratio and then suddenly experience a short but major crisis. For extended families, the pattern is very different. Cycles are shorter, phases of crises are longer, but the maximal *c/w* ratio is not nearly as high as it is for stem families (Fig. 7).

To reiterate, I hypothesize that in Hassunan society stem families prevailed, whereas the larger compounds in the Samarran society suggest extended families. These differences explain why there should be a greater tendency toward cooperation between households in the Hassunan sphere. Marked crises caused by labor shortage affect the organization of production in every household. Therefore,

households cannot survive without relying on each other's labor power in times of need. Social relations between households are characterized by alliances, and this dense web of mutual dependence translates materially into the intensive use of public space and communal storage buildings. In Samarran society, extended family structures lead to crises that are less severe but which last longer. The sheer length of these crises inhibits households' reliance on the help of other households. This tendency toward greater independence is possible only because the *c/w* ratio in times of need stays at levels much lower than predicted for stem families. This is shown by the different wavelength and wave-height for the respective family types (Fig. 7). In sum, if one uses compound size in these early villages as a correlate for family size and structure, the resulting family cycles have the potential to explain aspects of organization of labor and social relations of production. These conclusions are in accordance with those from the examination of the village layout.

Family structures certainly had an influence on property relations. The intensive cooperation between households in Hassunan society corresponds with communal storage practices. Since the consumption

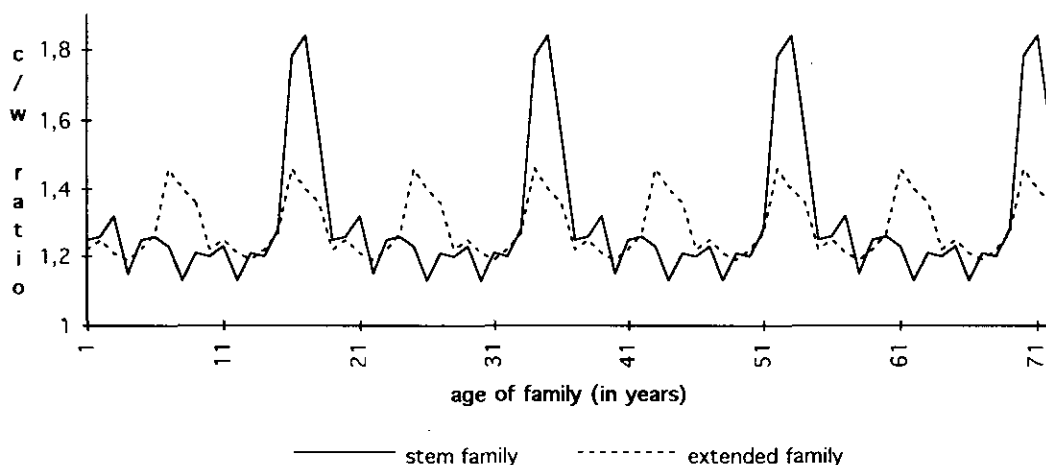


FIG. 7. Estimated consumer/worker ratios of stem and extended families.

of the product of labor is communal, there is no advantage for the single household in appropriating tracts of land. In addition, low population densities and cultivation based on rainfed agriculture make shortage of land unlikely. Thus, for the most important means of production in an agricultural society, land, communal ownership is highly probable. For Samarran society, a different picture emerges. As already pointed out, interhousehold cooperation in agricultural production was less than in Hassunan society. There are no indications for communal storage practices. Most important is the fact that with the introduction of simple irrigation, new, high-quality land became available. However, this means of labor had to be produced itself through preparation of fields in irrigable places and the construction of canals. Land was no longer a naturally existent factor in the production. It had to be transformed to become cultivable soil. It is therefore probable that the households did not invest more labor into the tedious preparation of land than necessary. The consequence is that there is not more cultivable land available than needed. To put it another way, cultivable land becomes a much more valuable means of production because its availability is no longer quasi-unlimited. As indicated above, single households in Samarran society could not rely on the products of other such units. Therefore, a strong pressure can be expected for the single household to keep its land together by mechanisms like inheritance or marriage rules (Goody 1976: 20; Bloch 1975: 209–216).

The mode of production of Hassunan society is characterized by simple forms of cooperation in working groups and by a network of alliances between households. In Samarran society, a mode of production prevails in which individual households were more independent and working groups were more structured. At first sight, these connections between inter-

household relations and forms of cooperation seem to be unexpected because complex forms of cooperation should occur where alliances between households are intensive. The reason for the observed pattern is again at least partly an outcome of the cyclical changes in labor power per economic unit as evidenced by family cycles. As shown above, periodic crises are inherent in family structure because of changes in their c/w ratios. Crises will hit every social unit sooner or later. Therefore, in a society where crises are solved by mutual assistance, the potential need for future help prevents families from using a currently socioeconomically advantageous position to acquire a particular status. Every household has obligations to its alliance partners and can also expect benefits from them. A strong egalitarian ideology may be one of the outcomes of such a situation. Where the cyclical household crisis is internally solved, as in Samarran society, a greater need to structure work "more effectively" may be felt. Reliance on others, though probably practiced to a certain extent, is much less developed. In this particular case, this can be shown to be true for the construction of houses, the production of ceramics, and agriculture. The workload involved is in all cases smaller than in Hassunan society. For construction work and the production of ceramics, the workload per unit produced is lower, as for agriculture the workload necessary to sustain one person. Concomitant to this higher effectiveness is a more complex organization of labor, more diverse and less broadly distributed means of labor.

Even though production and social relations of production are significantly different in these two societies, they seem to be relatively similar politically. In neither case is there any indication of formal or permanent political institutions. However, there are signs that the loss of intravillage reciprocity in Samarran society had a strong

effect on intervillage relations. In addition to the crises resulting from the structure of family cycles, ecological conditions were mentioned as another major factor which can lead to periodic reliance on other people. This contingency is especially strong where agriculture is completely dependent on annual rainfall and its hazardous fluctuations, as in Hassunan society. Here, alliances not only between households but also between villages can be expected in times of drought (see Halstead 1989: 74–75). Irrigation agriculture is less dependent on the vagaries of nature. Disasters occur more rarely and more likely in the form of flooding or plant diseases than drought. Irrigation and extended family structures lead in the longer term to a general weakening of social relations on intra- as well as intervillage levels. When ecological conditions worsen, the alliance mechanisms to deal with such a problem can no longer be activated. Instead of relying on assistance from a neighbor, a tendency toward “negative reciprocity” may become prevalent. This is archaeologically manifest in defensive works.

DISCUSSION

Hassunan and Samarran societies are only slightly different in terms of objects of labor or what are traditionally considered by archaeologists as diagnostic features of a society. However, an analysis of the means of labor and of evidence for the organization of labor leads to the conclusion that there are essential differences. This is supported by indications for particular social relations of production. Whereas Hassunan society could be described as having a “domestic mode of production” in Sahlins’ terms (1972), in Samarran society there are clear signs of a dissolution of such a mode of production. Developments in the early 5th millennium B.C. confirm this impression. In northern Mesopotamia, with the advent of what is called the Halaf so-

ciety, the objects of labor change. However, there is also continuity in that there are only weak indications of internal political differentiation in villages.²² Families continued to consist of only a few members, judging by the size of houses, and subsistence is based on herding and rain-fed agriculture. In middle and southern Mesopotamia, on the other hand, intravillage hierarchization is clearly documented in post-Samarran villages associated with the Ubaid culture. For example, in Tell Abada, level I, different house sizes (but with the same plans) and a prominent building with thicker walls and an elaborate facade suggest that one household achieved a permanent special position. At the same time, the oldest known public building is attested from the site of Eridu in the southern alluvium. The loss of social coherence in Samarran times was obviously soon used by some household units to gain a permanent power base.

In spite of these fundamental changes in post-Samarran times, the structure of the basic social units, extended families, remained the same as in Samarran society. In terms of means of production and organization of labor, too, there are no major changes in the periods immediately following the Samarran. Irrigation agriculture remained the main subsistence activity. Generally, forces of production seem to have changed significantly with the advent of Samarran society, but continued to exist in the Ubaid period.

As was outlined above, “normal surplus” production in Samarran society was low compared to that in Hassunan society. This, combined with an effective organization and means of labor, is an indication of a relative underuse of labor power. In an historic situation where underuse of labor power cooccurs with disruptive tendencies in social ties, it is relatively easy for single social units like households to acquire a special status and to force other people to produce an agricultural surplus which is

then appropriated by the prominent household or institution. The basis for such a new mode of production in which tribute was paid to local or even regional authorities (see Pollock 1989: 286) was laid with the developments in the forces of production in Samarran society.

In the Mesopotamian case, Balibar's structural model of modes of production can usefully be applied to archaeological data because it allows an in-depth analysis of production processes and their social background. By comparing two societies, the Hassunan and the Samarran, it becomes apparent that there are fundamental differences in their modes of production even though the material culture of both is at first sight similar. In a broader time frame, the analysis of this single case confirms once more Marx's well-known assumption, namely that forces of production develop at a faster pace than social relations of production. The emergence of a fully developed tributary mode of production in the Ubaid period in 5th millennium Mesopotamia is based on previous changes in the forces of production. It does not follow, however, that this kind of differential development of forces and social relations of production is a law-like phenomenon. It means only that Marx's original assumption is not contradicted by this case. Contrary to what Marx thought, the historical trajectory from a domestic to a tributary mode of production should not be evaluated as a step in a unified human history of progress. To use the terminology of Habermas (1984), the socioeconomic system became more effective, but the quality of the "Lebenswelt"—the "lived world"—declined.

ACKNOWLEDGEMENTS

A shorter version of this paper was presented at a meeting of the "Arbeitsgemeinschaft Theorie" at the colloquium on "Marxismus in der Archäologie," February 20, 1993, Rückerbach (Germany). I thank the participants for their critiques. Susan Pollock offered

encouragement and critical comments on many occasions. I am also grateful to Norman Yoffee, Hans Nissen, Henry Wright, Phil Kohl, Stefan Hauser, and an anonymous reviewer for their critical and helpful comments on various drafts of this paper.

REFERENCES CITED

- Abu es-Soof, Behnam
 1971 Tell es-Sawwan. Fifth season's excavations (Winter 1967–1968). *Sumer* 27:3–8.
- Althusser, Louis, and Etienne Balibar
 1979 *Reading "Capital."* Verso, London.
- Applebaum, Herbert
 1984 Theoretical introduction. In *Work in non-market and transitional societies*, edited by Herbert Applebaum, pp. 1–38. State Univ. of New York Press, Albany.
- Balfet, Hélène (Ed.)
 1991 *Observer l'action technique. Des chaînes opératoires, pour quoi faire?* Éditions du CNRS, Paris.
- Bergmann, Theodor
 1990 Socioeconomic situation and perspectives of the individual peasant. *Sociologia Ruralis* 30(1):48–61.
- Bernbeck, Reinhard
 1994 *Die Auflösung der häuslichen Produktionsweise. Das Beispiel Mesopotamiens.* Dietrich Reimer, Berlin.
- Bloch, Maurice
 1975 Property and the end of affinity. In *Marxist analyses and social anthropology*, edited by Maurice Bloch, pp. 203–228. Wiley, New York.
- Boserup, Esther
 1965 *The conditions of agricultural growth.* Allen and Unwin, London.
- Bottema, Sytze
 1989 Notes on the prehistoric environment of the Syrian djézireh. In *To the Euphrates and beyond*, edited by Odette M. C. Haex, Hans H. Curvers, and Peter M. M. G. Akkermans, pp. 1–16. A. A. Balkema, Rotterdam.
- Breniquet, Cathérine
 1992 Rapport sur deux campagnes de fouilles à Tell es-Sawwan, 1988–1989. *Mesopotamia* 27:5–30.
- Charles, M. P.
 1990 Traditional crop husbandry in southern Iraq 1900–1960 A.D. *Bulletin on Sumerian Agriculture* 5:47–64.
- Chayanov, Alexander V.
 1966 *The theory of peasant economy.* Richard D. Irwin, Homewood, IL.
- Chesneaux, Jean
 1969 Le mode de production asiatique. *Quelques*

- perspectives de recherche. In *Sur le 'mode de production asiatique'*, edited by Roger Gaudy, pp. 13–46. Éditions Sociales, Paris.
- Copeland, Lorraine, and Francis Hours
 1987 L'expansion Halafienne, une interprétation de la répartition des sites. In *Préhistoire de la Mésopotamie*, edited by Jean-Louis Huot, pp. 209–220. Éditions du CNRS, Paris.
- Cresswell, Robert
 1972 Les trois sources d'une technologie nouvelle. In *Langues et techniques, nature et société. Tome II. Approche ethnologique, approche naturaliste*, edited by J. Thomas and L. Berriot, pp. 21–27. Klincksieck, Paris.
 1990 "A new technology" revisited. *Archaeological Review from Cambridge* 9(1):39–54.
- Currie, Kate
 1984 The Asiatic mode of production: Problems of conceptualising state and economy. *Dialectical Anthropology* 8:251–268.
- Delcroix, Gilbert, and Jean-Louis Huot
 1972 Les fours dits "de potier" dans l'Orient ancien. *Syria* 49:35–95.
- Elliott, Gregory
 1993 The lonely hour of the last instance: Louis Pierre Althusser, 1918–1990. In *The Althusserian legacy*, edited by E. Ann Kaplan and Michael Sprinkler, pp. 233–240. Verso, London.
- Engels, Friedrich
 1905 *The origin of the family, private property and the state*. Kerr, Chicago.
- Ergenzinger, Peter, Wolfgang Frey, Hartmut Kühne, and Harald Kürschner
 1988 The reconstruction of environment, irrigation and settlement on the Habur in North-East Syria. In *Conceptual issues in environmental archaeology*, edited by John L. Bintliff, Donald A. Davidson, and Eric G. Grant, pp. 108–128. Univ. of Edinburgh Press, Edinburgh.
- Feest, Christian F., and Alfred Janata
 1989 *Technologie und Ergologie in der Völkerkunde*, Vol. II. Dietrich Reimer Verlag, Berlin.
- Forest, Jean-Daniel
 1983 Aux origines de l'architecture obéidienne: Les plans de type Samarra. *Akkadica* 34:1–47.
- Foster-Carter, Aidan
 1978 The modes of production controversy. *New Left Review* 107:47–77.
- Fried, Morton
 1967 *The evolution of political society*. Random House, New York.
- Friedman, Jonathan
 1974 Marxism, structuralism and vulgar materialism. *Man N.S.* 9:444–469.
- Goldstein, Lynne
 1981 One-dimensional archaeology and multi-dimensional people: spatial organization and mortuary analysis. In *The archaeology of death*, edited by Robert Chapman, Ian Kinnes, and Klavs Randsborg, pp. 53–69. Cambridge Univ. Press, Cambridge.
- Goody, Jack
 1976 *Production and reproduction. A comparative study of the domestic domain*. Cambridge Studies in Social Anthropology 17. Cambridge Univ. Press, Cambridge.
- Habermas, Jürgen
 1981 Modernity versus postmodernity. *New German Critique* 22:3–14.
 1984 *The theory of communicative action*. Beacon Press, Boston.
- Hall, D. W.
 1970 *Handling and storage of food grains in tropical and subtropical areas*. Food and Agriculture Organization of the United Nations, Rome.
- Halstead, Paul
 1989 The economy has a normal surplus: Economic stability and social change among early farming communities of Thessaly, Greece. In *Bad year economics. Cultural responses to risk and uncertainty*, edited by Paul Halstead and John O'Shea, pp. 68–80. Cambridge Univ. Press, Cambridge.
- Hammel, E. A., and C. Mason
 1993 My brother's keeper. Modelling kinship links in early urbanization. In *Old and new methods in historical demography*, edited by David S. Reher and Roger Schofield, pp. 318–342. Clarendon, Oxford.
- Hart, Keith
 1983 The contribution of marxism to economic anthropology. In *Economic anthropology. Topics and theories*, edited by Sutti Ortiz, pp. 105–144. University Press of America, Lanham.
- Helbaek, Hans
 1964 Early Hassunan vegetable at Es-Sawwan near Samarra. *Sumer* 20:45–48.
- Heller, Agnes
 1972 *Hypothese über eine marxistische Theorie der Werte*. Suhrkamp, Frankfurt.
- Herzfeld, Ernst
 1930 *Die vorgeschichtlichen Töpfereien von Samarra. Die Ausgrabungen von Samarra*, Vol. V. Dietrich Reimer, Berlin.
- Hobsbawm, Eric J.
 1964 Introduction. In *Karl Marx. Pre-capitalist economic formations*, edited by Eric J. Hobsbawm, pp. 9–65. International Publishers, New York.

- Hole, Frank
 1987 Archaeology of the Village Period. In *The archaeology of western Iran*, edited by Frank Hole, pp. 29–78. Smithsonian Institution Press, Washington.
- Jaeggi, Urs
 1975 Theorie der Geschichte—Geschichte der Theorie? *Das Argument* 94:952–975.
- Jewsiewicki, Bogumil
 1981 Lineage mode of production: Social inequalities in equatorial central Africa. In *Modes of production in Africa. The precolonial era*, edited by Donald Crummey and C. C. Stewart, pp. 92–113. Sage, Beverly Hills.
- Kamada, Hiroko, and Tadahiko Ohtsu
 1981 Tell Songor A. *Al-Rafidan* 2:164–181.
- Kirkbride, Diana
 1982 Umm Dabaghiyah. In *Fifty years of Mesopotamian discovery*, edited by John Curtis, pp. 11–21. Stephen Austin, Hertford.
- Kohl, Philip
 1984 Force, history and the evolutionist paradigm. In *Marxist perspectives in archaeology*, edited by Matthew Spriggs, pp. 127–134. Cambridge Univ. Press, Cambridge.
- Krader, Lawrence
 1972 *The ethnological notebooks of Karl Marx*. Van Gorcum, Assen.
- Lee, James, and Jon Gjerde
 1986 Comparative household morphology of stem, joint, and nuclear household Systems: Norway, China, and the United States. *Continuity and Change* 1(1):89–111.
- Lemonnier, Pierre
 1992 *Elements for an anthropology of technology*. Anthropological Papers, Museum of Anthropology, 88. University of Michigan, Ann Arbor.
- Lenin, Vladimir I.
 1969 *'Left-wing' communism, an infantile disorder; a popular essay in Marxian strategy and tactics*. International Publishers, New York. [First edition 1920]
- Leroi-Gourhan, André
 1971 *L'homme et la matière*. Albin Michel, Paris.
 1973 *Milieu et techniques*. Albin Michel, Paris.
- Lewis, John van D.
 1981 Domestic labor intensity and the incorporation of Malian peasant farmers into localized descent groups. *American Ethnologist* 8:53–73.
- Lloyd, Seton, and Fuad Safar
 1945 Tell Hassuna. *Journal of Near Eastern Studies* 4:255–289.
- Malinowski, Bronislaw
 1961 *Argonauts of the western Pacific*. Dutton, New York.
- Marx, Karl
 1962 *Das Kapital. Band I. Marx-Engels-Werke*, Vol. 23. Dietz-Verlag, Berlin. [First edition 1867]
 1983 *Grundrisse der Kritik der Politischen Ökonomie*. Marx-Engels-Werke, Vol. 42, pp. 47–768. Dietz-Verlag, Berlin. [First edition 1939]
- Meillassoux, Claude
 1981 *Maidens, meal and money: Capitalism and the domestic community*. Cambridge Univ. Press, Cambridge.
- Mellaart, James
 1975 *The neolithic of the Near East*. Thames & Hudson, London.
- Merpert, Nikolai la., and Rauf M. Munchaev
 1973 Early agricultural settlements in the Sinjar plain, northern Iraq. *Iraq* 35:93–113.
 1987 The earliest levels at Yarim Tepe I and Yarim Tepe II in northern Iraq. *Iraq* 49:1–36.
- Merpert, Nikolai la., Rauf M. Munchaev, and N. O. Bader
 1978 Soviet investigations in the Sinjar plain 1975. *Sumer* 34:27–70.
- Mesnil du Buisson, Comte du
 1948 *Baghouz l'ancienne Corsoté. Le tell archaïque et la nécropole de l'âge du bronze*. Brill, Leiden.
- Morgan, Lewis H.
 1985 *Ancient society*. Univ. of Arizona Press, Tucson. [Reprint of the 1878 edition, with a preface by Elizabeth Tooker]
- Neynaber, Adolf
 1920 *Die Wehrbauten des Irak. Bauwissenschaftliche Beiträge, Band 7*. Zirkel-Verlag, Berlin.
- Oates, David, and Joan Oates
 1976 Early irrigation agriculture in Mesopotamia. In *Problems in economic and social archaeology*, edited by G. Sieveking, I. H. Longworth, and K. E. Wilson, pp. 109–135. Duckworth, London.
- Oates, Joan
 1969 Choga Mami, 1967–68. A preliminary report. *Iraq* 31:115–152.
- Pelegrin, Jacques, Claudine Karlin, and Pierre Bodu
 1988 Chaînes opératoires: Un outil pour le préhistorien. In *Technologie préhistorique*, edited by Jacques Tixier, pp. 55–62. Notes et Monographies Techniques 25. CNRS, Paris.
- Pigeot, Nicole
 1990 Technical and social actors: Flintknapping specialists at Magdalenian Etiolles. *Archaeological Review from Cambridge* 9(1):126–141.
- Polanyi, Karl
 1957 Aristotle discovers the economy. In *Trade and markets in the early empires*, edited by Karl Polanyi, Conrad M. Arensberg, and Harry W. Pearson, pp. 64–96. Gateway Edition, Chicago.

- Pollock, Susan
1989 Power politics in the Susa A period. In *Upon this foundation. The 'Ubaid reconsidered*, edited by Elizabeth Henrickson and Ingolf Thuesen, pp. 281–292. Museum Tusculanum Press, Copenhagen.
- Popper, Karl R.
1964 *The poverty of historicism*. Harper & Row, New York.
- Porada, Edith, Donald P. Hansen, Sally Dunham, and Sidney H. Babcock
1992 Mesopotamia, In *Chronologies in Old World archaeology*, edited by Robert W. Ehrich, 3rd ed. Vol. 1, pp. 77–121. Univ. of Chicago Press, Chicago.
- Rappaport, Roy A.
1979 *Ecology, meaning, and religion*. North Atlantic Books, Berkeley.
- Redman, Charles
1978 *The rise of civilization*. Freeman, San Francisco.
- Rice, Prudence M.
1987 *Pottery analysis. A sourcebook*. Univ. of Chicago Press, Chicago.
- Sahlins, Marshall
1972 *Stone age economics*. Aldine de Gruyter, New York.
- Saxe, Arthur
1970 *Social dimensions of mortuary practices*. Ph.D. thesis. University Microfilms, Ann Arbor, MI.
- Service, Elman R.
1962 *Primitive social organization*. Random House, New York.
- Sheehy, James J.
1988 Ceramic ecology and the clay/fuel ratio: Modeling fuel consumption in Tlajinga 33, Teotihuacan, Mexico. In *Ceramic ecology revisited*, edited by Charles C. Kolb, Vol. 1, pp. 199–226. British Archaeological Reports, International Series 436, Oxford.
- Stalin, Josef
1947 Dialektischer und historischer Materialismus. In Josef Stalin, *Fragen des Leninismus*, pp. 647–679. Verlag für Fremdsprachige Literatur, Moskau.
- Terray, Emmanuel
1972 *Marxism and "primitive" societies; Two studies*. Monthly Review Press, New York.
- Tosi, Maurizio
1984 The notion of craft specialization and its representation in the archaeological record of early states in the Turanian basin. In *Marxist perspectives in archaeology*, edited by Matthew Spriggs, pp. 22–52. Cambridge Univ. Press, Cambridge.
- Wahida, Ghanim
1967 The excavations of the third season at Tell es-Sawwan, 1966. *Sumer* 23:167–176.
- Watson, Patty J.
1978 Architectural differentiation in some Near Eastern communities, prehistoric and contemporary. In *Social archeology. Beyond subsistence and dating*, edited by Charles L. Redman, Mary J. Berman, Edward V. Curtin, William T. Langhorne Jr., Nina M. Versaggi, and Jeffery C. Wanser, pp. 131–158. Academic Press, New York.
- 1983 The Halafian culture. A review and synthesis. In *The hilly flanks and beyond: Essays on the prehistory of southwestern Asia*, edited by T. Cuyler Young, P. E. L. Smith, and Peder Mortensen, pp. 231–250. Studies in Ancient Oriental Civilizations 36. Univ. of Chicago Press, Chicago.
- White, Leslie A., and Beth Dillingham
1973 *The concept of culture*. Burgess, Minneapolis.
- Wulff, Hans E.
1966 *The traditional crafts of Persia. Their development, technology and influence on eastern and western civilizations*. M.I.T. Press, Cambridge, MA.
- Yasin, Walid
1970 Excavation at Tell es-Sawwan, 1969. Report on the sixth season's excavations. *Sumer* 26:3–35.
- Yoffee, Norman
1993 Too many chiefs? or safe texts for the 90s. In *Archaeological theory: Who sets the agenda?*, edited by Norman Yoffee and Andrew Sherratt, pp. 60–78. Cambridge Univ. Press, Cambridge.

NOTES

¹ Many of today's circles of communist political activists continue to show such a sectarian character.

² The catastrophes of Bhopal and Chernobyl are two of the most striking examples of a rapidly increasing number of such disasters.

³ This work has been heavily criticized. An important objection is that class struggle no longer plays a role in the theory (Jaeggi 1975: 967). This is a logical consequence of an abstract theory insofar as the theory of modes of production is supposed to apply to any society, including classless societies in which class struggle is by definition absent. The objection implies that the level of abstraction is too high and that Marxist theory can apply only to class societies.

⁴ Balibar maintains that Marxist theory is strongly anti-evolutionary (Althusser and Balibar 1979: 225–226). One has to remember that the term "evolution" is used very differently by cultural anthropologists of Anglo-American tradition and by French and Ger-

man thinkers of Marxist persuasion. A sequence of more and more complex stages through which a society develops, whereby western industrial society is seen as the most complex and therefore most "advanced" stage (White and Dillingham 1973: 59–63), is characteristic of anthropological conceptions of cultural evolution. In Marxist writings, evolution is defined as continuous development versus discontinuous or "revolutionary" development. It is clear from Marx's writings that he thought in terms of stages and that for him there was a trend towards more complex but also more just societies. Marxism is anti-evolutionary in Marxist terms but contains a strong evolutionary element as defined by anthropologists.

⁵ The use of jargon is a problem inherent in almost all approaches in the social sciences. Postmodern vocabulary and the language of critical or systems theory are not understandable without some introductory texts.

⁶ I follow Friedman's (1974) free but appropriate translation of the German term *Arbeitskräfte*. In the English version of *Reading Capital* (Althusser and Balibar 1979), the term "labor power" is used.

⁷ As already mentioned, there are some means of labor which are not produced. In most cases, they are very simple tools like sticks or hammerstones. Such means of labor do not undergo any treatment and are thus not objects of labor.

⁸ Whereas Anglo-American anthropologists were traditionally concerned with much broader aspects of the economy, especially exchange patterns and the "embeddedness" of production in social institutions (see Polanyi 1957: 69–71), a branch in continental European ethnology was continuing to collect artifacts from nonwestern cultures with a narrow interest in their functions (Feest and Janata 1989).

⁹ Repetitiveness of tasks may be due partly to the fact that marginal utility of labor in nonwestern peasant societies is low.

¹⁰ Traditionally, these entities are called "cultures." To make clear that the terms "Hassuna" and "Samarra" denote human beings and their relationships behind the artifacts, I prefer the word society.

¹¹ Typical Samarran grave goods are known mainly from the site of Samarra which Herzfeld interpreted as a graveyard. The famous child burials from level I at Tell es-Sawwan with their elaborate alabaster figurines must be dated to an earlier period (ca. 5500 B.C.) than the one considered here. The stratigraphy of this level is particularly unclear (Forest 1983; Bernbeck 1994: 171–173) so that an interpretation of the graves as indications of evidence for a society with ascribed status must remain problematic.

¹² For estimations of calibrated dates see Porada et al. 1992: 83.

¹³ On both Hassunan and Samarran sites, a low-fired straw tempered soft ware was found which was almost never decorated. This ware was probably not kiln-fired. At Yarim Tepe I, level 4, a large number of simple round "kilns" were found. Initially, they were considered to be part of an industrial complex for ceramic production (Merpert and Munchaev 1973: 96). Their shape and size is similar to that of present-day bread ovens, and the excavators now suggest such a function for them (Munchaev, pers. comm.), an interpretation which is followed here.

¹⁴ I use Sheehy's figures in an illustrative sense only. Obviously, the actual numbers will vary for different ceramic traditions. The important point is the nonlinear relationship between kiln size and fuel required.

¹⁵ It is possible that small-scale garden or orchard irrigation was practiced in favorable places. Such occasionally occurring activities are not of major relevance for economic organization of work on the whole.

¹⁶ The existence of canals does not mean that political control was present to regulate the distribution of water. Canals were so small that they could have been built and maintained by single households.

¹⁷ In two preliminary reports (Abu es-Souf 1971: 3–4; Yasin 1970: 3–5), the excavators claimed that the houses of level III A at Tell es-Sawwan were turned into storage buildings in level III B. The evidence for this—increasing numbers of partition walls in formerly larger rooms—is inconclusive. Also, the question of where the population of the village had its habitations at the time of level III B is left unanswered.

¹⁸ The numbers are in part derived from Watson's calculations (1978). For a discussion of these and further measurements see Bernbeck 1994: 312–316 and Appendix B.

¹⁹ For these early societies, the assumption of an identity between household and family is justified insofar as kinship is the major structuring principle of society. It would be useful to pursue the influence of kinship structure and family size on household cycles with a sophisticated simulation program such as SOCSIM, but that is beyond the scope of this paper (see Hammel and Mason 1993: 321–322).

²⁰ Sahlins' (1972: 102–123) much debated interpretation of "Chayanov's Rule" is only of secondary concern here.

²¹ There are no indications for differential fertility or mortality rates in the two societies concerned.

²² However, see the debate between Watson (1983) and Copeland and Hours (1987).