

Appearance and first development of cooking and “non-cooking” ware concepts in the Near East

Marie Le Mière¹ and Maurice Picon¹

¹Maison de l’Orient Méditerranéen Ancien, 7 rue Raulin, 69365 Lyon cedex 07, France.

Abstract

Cooking ware and “non-cooking” ware can be defined, whether technically, on the base of fabric characteristics, or by the actual use of pottery for cooking: we will start mentioning the difficulties caused by the often approximative or even random concordance between the two definitions. We will also insist on the slowness of the transformations of pottery techniques when they imply modifications of food uses.

These questions are central to our investigation into the emergence of “non-cooking” ware and cooking ware and the way they start differing from each other in the Near East during the early Pottery Neolithic. This study is based on sites that are few in number, yet rather well studied from both the archaeological and the technical points of view. In the material from these sites clear differences in techniques and uses of every ware can be clearly identified, the sites being Tell Bouqras (Syria, 1st half of the VIIIth millenium B.P.), Tell Halula (1st quarter of the VIIIth millenium B.P.) and Tell Sabi Abyad (Syria, midth of the VIIIth millenium B.P.). Some special types of pottery, such as the Dark-Faced Burnished Ware, produced in North Syria – Cilicia (Ras Shamra, the Amuq plain, Mersin...) will be studied as well. Then we will examine the production of some earlier sites where technical differentiation is not yet settled.

Key-words: Pottery, Neolithic, Near East, Cooking-Ware, Technical Evolution

INTRODUCTION

We intend in this contribution to investigate when and how cooking ware became clearly distinct from “non-cooking ware”: as a matter of fact it seems to have happened rather soon after the beginning of pottery technique, during the first stages of its development. We will shortly present these stages, but first we have to explain the precise vocabulary we will use and recall a few pieces of technical data about these productions.

COOKING AND “NON-COOKING” WARES

We will use the term “cooking ware” for pottery made of a paste suitable for being used on the fire to cook food. But it is obvious that all the cooking ware vessels can be used

for other purposes, as simple containers, for example. Opposed to this we will consider as “non-cooking ware” pottery made of a paste which is not suitable for frequent use for cooking food. So we will pay more attention to suitability through the paste characteristics than to the actual use of the pottery. Nevertheless we will take into account the effective use so far as archaeological data can prove it.

Pottery made of a very rigid structured paste cannot be used frequently for cooking food. When cooking food, the different parts of the vessel are submitted to strong differences of temperature: pottery made of a rigid textured paste does not give good possibilities of expansion in every part of the vessel, which can induce very strong stresses and thus produce cracks or even breaks

(thermic shocks). Pottery made of such paste has usually been fired at high temperature, especially in the case of calcareous pastes (CaO > 7-8%, firing temperature > 900°C, very fine inclusions of calcite in the paste). In the Near East the Neolithic “non-cooking” ware is made of this type of paste, often very calcareous. We will study its development.

Pottery which can be used frequently for cooking food is made of paste the texture of which is not so rigid, also said to be a loose texture. Such a characteristic makes it possible for the diverse parts of the vessel, which are submitted to strong differences of temperature, to expand diversely according to differences in temperature and hence to buckle without creating stresses which could heavily damage the vessel. A loose texture can result from a low firing. It can be further improved by adding a big quantity of temper, when possible well calibrated. This temper will limit the cracks’ progression, when they appear. We will see how and when pottery made of loose-textured paste started to be made in the Near East during the Neolithic.

Regarding these two different wares, cooking and “non-cooking”, we will try to elucidate whether their characteristics are intentional or fortuitous.

CONTEXT AND GENERAL EVOLUTION

The context of our investigation is that of the beginnings of pottery technique which started in the Near East roughly in the second half of the 9th millenium B.P. This period is rather badly documented, with few investigated sites, mostly only sounded and, when dated, rarely accurately. Therefore, when looking for the first pottery sites, we will take into consideration three different elements: the date; whether it has a continuous sequence including pre-pottery and pottery levels or not; and the technical characteristics of the pottery.

If some sites can be dated from this period¹, and if quite a number of them present

a pre-pottery/pottery sequence², only a very few have provided a pottery which is not particularly developed and which could thus correspond to the first elaboration of this technique. Tepe Guran, in the Zagros, is the most interesting one by the conjunction of its dating, of a pre-pottery/pottery sequence, and of the characteristics of the pottery which appears in level S: it is grey-brown, rather soft and said not to be high fired, and seems to be rather primitive (Mortensen, 1963). This pottery, found in very small quantities, still appears (in even smaller quantities) in later levels together with a more developed plant tempered ware, but soon disappears completely (level N).

Çatal Hüyük³, in Anatolia, presents surely two of the elements mentioned above, an early date and some “primitive” pottery comparable with that of Tepe Guran, since it is also brown and rather soft; it is mostly plant tempered. Pre-pottery levels are not yet confirmed but strongly suspected. The “primitive pottery”, in the earliest level where it has been recorded to date (level XII)⁴, was found together with some more developed examples, so, if the sequence is really the same as Tepe Guran one, we are still missing the earliest pottery level, containing only “primitive” pottery. Anyway, as in Tepe Guran, this “primitive” pottery, found only in small quantities here as well, soon disappears.

² Choga Banut in the Khuzistan, Ali Kosh and Choga Sefid in the Deh Luran; Jarmo and Tepe Guran in the Zagros; Ginnig in the Iraquian Jezirah (and also Magzalia, a pre-pottery site where a unique sherd has been found); Tell Seker al-Aheimar in the Khabur valley; Tell Assouad, Tell Sabi Abyad II and Tell Damishliyya in the Balikh valley; Gritille, Akarçay Tepe, Tell Halula and Bouqras in the Euphrates valley; Tell Ramad in Damascus area; Labwe in the Bekaa; Ras Shamra an Tell el-Kerkh in North Levant; and lastly, Suberde in Anatolia. We do not include the Syrian Desert and South Levant sites, the sequence of which includes pre-pottery and pottery levels, because the beginning of pottery in these regions will take place somewhat later (see below). See the bibliography of these sites in Le Mière Picon, 1998, except that of Akarçay Tepe (Balkan-Atli, Molist, to appear) and Tell Seker al-Aheimar (Nishiaki, 2001).

³ Mellaart, 1964; Mellaart, 1966; Hodder, 1999 [Introduction: Çatalhöyük 1999. In: Çatalhöyük 1999 Archive Report, <http://catal.arch.cam.uk/>]; Last, 1999 [Pottery/Çanak-çömlek. In: Çatalhöyük 1999 Archive Report, <http://catal.arch.cam.uk/>].

⁴ Observations by M. Le Mière in Konya Museum on the material of Mellaart’s excavations, which was made available thanks to J. Mellaart’s kind permission.

¹ Tepe Guran (Mortensen, 1963: 120), Bouqras (Akkermans *et alii*, 1981: 490), Gritille (Hours *et alii*, 1994: 396-397), Tell Assouad (Cauvin, 1974: 203), Çatal Hüyük (*Radiocarbon* 7, 1965: 191; *Radiocarbon* 11, 1969: 154-155).

So it seems that pottery technique could also have been developed in Çatal Hüyük.

Ras Shamra (Contenson, 1992) and Tell el-Kerkh (Tsuneki and Miyake, 1996; A. Tsuneki and Y. Miyake, pers. comm.), in North Levant, are not far from each other: both sites present a pre-pottery/pottery sequence, and, if Ras Shamra's earliest pottery level is not so early-dated, the Tell el-Kerkh one, not yet dated as such, could possibly date back to the end of the 9th millenium B.P (Tsuneki *et alii*, 2000). The most important element is the presence in both sites, in the first pottery level (Tell el-Kerkh level 6, Ras Shamra VB), of a peculiar type of pottery, mostly very calcareous and moreover very heavily plant tempered and therefore extremely porous: it has been called "*poterie friable*" in Ras Shamra (Contenson, 1992). It could also be considered as "primitive" though it is very different from the Tepe Guran and Çatal Hüyük examples: and, though it is found on both sites together with some other wares, it disappears very early in the sequence, as the "primitive" ware does in Tepe Guran and Çatal Hüyük. As in Çatal Hüyük, the earliest pottery level containing only this primitive pottery is still missing on both sites, so that the beginning of pottery technique is not represented as such; but it could have taken place in this region as well, suggesting again that the beginning of pottery technique happened independently in different parts of the Near East.

Thus, the sites where pottery could represent the very beginning of this technique are still quite rare (Fig. 1). Nevertheless it seems possible, from the available data, to hypothesize an elaboration of the pottery technique in the Near East also⁵.

The second stage of development of pottery technique can be recognized on more numerous sites, especially in certain areas (Fig. 2). It is characterised by a pottery assemblage which is still rather simple, with one or two different wares at most, very

simple shapes and no (or very rare) decoration. Recent investigations have provided new data which give a more detailed picture, although still provisional, of this stage: at two sites, Tell Akarçay (J.-M. Faura, Y. Miyake, pers. comm.) in the Euphrates valley and Tell Sheker al-Aheimar in the Khabur valley. The earliest pottery is mineral tempered (crushed calcite in Tell Akarçay, crushed volcanic rocks in Tell Sheker) when the earliest pottery previously known for this stage was plant tempered. At both sites plant tempering appears progressively, first associated with the mineral tempering mentioned above and afterwards alone. The appearing of plant tempering marks a second step in the development of pottery technique at these two sites; nevertheless shapes and decoration stay very simple and because the evolution is very progressive we will provisionally consider these two steps as parts of the same stage of pottery development, even if further work will possibly lead to a new picture. The sites where only the second step of the stage is represented are mostly situated in the Balikh and Euphrates valley (Fig. 2). Tell el-Kerkh is the only North Levant site where stage 2 is definitely represented: while shapes are very simple and decoration absent, the assemblage consists of *Kerkh Ware* and *Dark-Faced Burnished Ware*, both mineral tempered. After the primitive plant tempered ware (*poterie friable*) disappeared, plant tempering was hardly (or not at all) used until the end of the next stage; as we will see later, technical traditions seem to be quite different in this area.

The third stage of development is that of spreading out of the technique, since pottery is found on every site, except in the Syrian desert and the Southern Levant where pottery technique seems to have appeared a few hundred years later than anywhere else (Fig. 3). Pottery becomes, at this stage, very varied in ware, shape, decoration and size. At the same time pottery gains clear regional characteristics, which hardly appeared at all during the previous stage. Four ceramic regions (Fig. 3) can be roughly

⁵ If considering the date of the beginning of pottery technique in the Near East, the second half of the 9th millenium B.P., at that time pottery was yet known in Japan (Imamura, 1996: 51) and also in North Sahara (Close, 1995: 24); hence this technique could have been imported in the Near East.

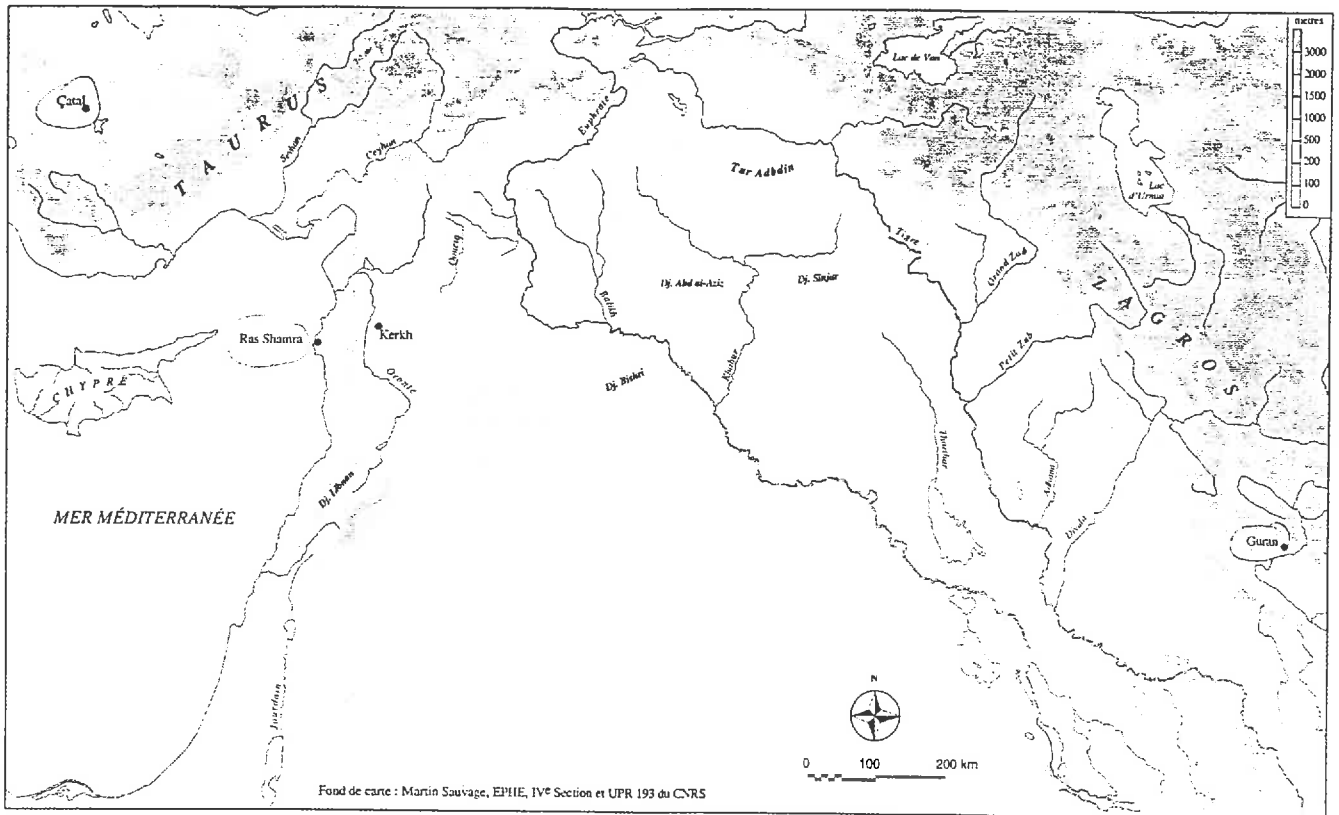


Fig. 1 - Map of the sites representing the first stage of development of pottery technique in the Near East.

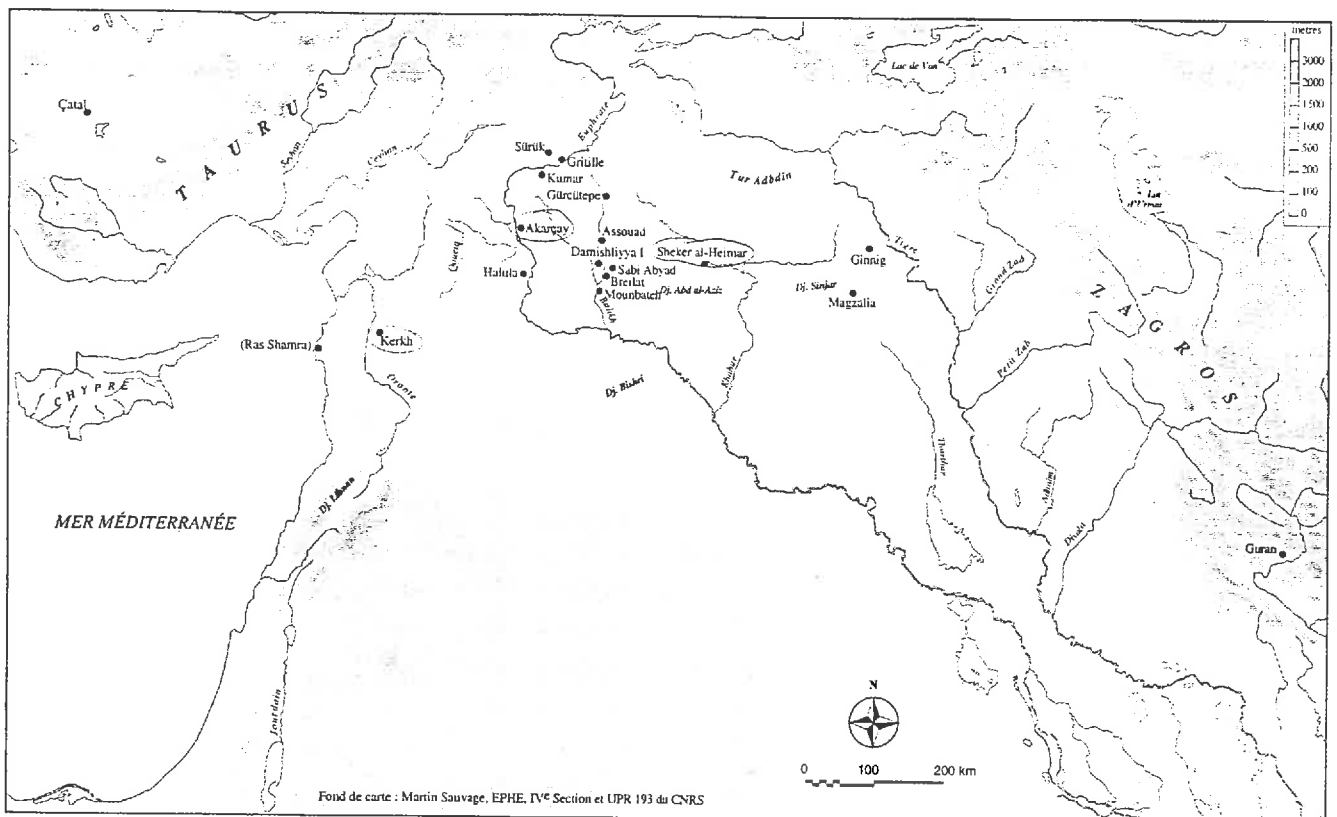


Fig. 2 - Map of the sites representing the second stage of development of pottery technique in the Near East.

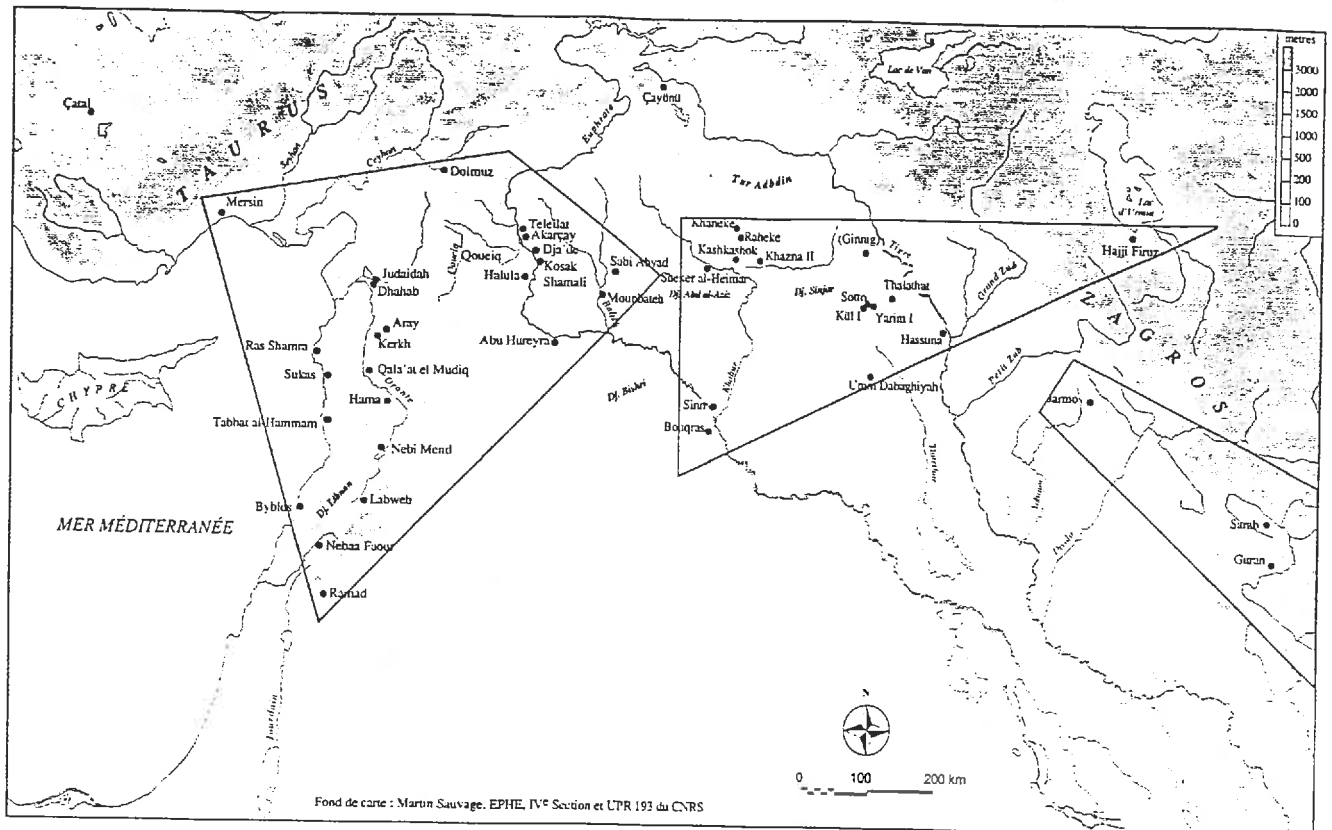


Fig. 3 - Map of the sites representing the third stage of development of pottery technique in the Near East.

distinguished—the Zagros⁶, Northern Mesopotamia⁷, North-Syria - Cilicia⁸ and Anatolia⁹—even if their limits are still not quite precise and, in some cases, they could be subdivided.

We must emphasize the fact that these stages are identified on the base of technical developments and not on that of chronology. The beginnings of pottery technique could have happened somewhat earlier or later in the different regions and the rhythm of development might not be exactly the same everywhere; but with the exception of the two regions mentioned above, these first three stages of development of pottery technique

took place in a range of time from roughly the second half of the 9th millennium B.P. for the first stage and the middle of the 8th millennium B.P. for the third. It is difficult to be more precise since datings are rather rare and often not fully reliable.

We choose to start from the third stage when pottery is rather developed and the position of cooking and “non-cooking” wares is more or less settled. Then we will proceed back to the preceding stages when the situation looks still rather puzzling, but could be cleared up by the later one.

We will not consider the whole area of the Near East but will instead focus on the northern part of Mesopotamia¹⁰, especially in the Euphrates valley and in the valleys of its tributaries, Balikh and Khabur. In this area several sites of the period have been investigated and the geological context, the large alluvial plain of Mesopotamia, is very homogeneous: calcareous clays are largely widespread and in most cases no other clays

⁶ See in Le Mière, Picon, 1998: 15 and notes 70 and 71 the ceramic characteristics, the sites, the description of the area and the references.

⁷ See in Le Mière, Picon, 1998: 15 and note 72 the ceramic characteristics, the sites, the description of the area and the references.

⁸ See in Le Mière, Picon, 1998: 15 and notes 73 and 74 the ceramic characteristics, the sites, the description of the area and the references.

⁹ See in Le Mière, Picon, 1998: 16 and note 75 the ceramic characteristics, the sites, the description of the area and the references.

¹⁰ It includes parts of two of the ceramic regions previously mentioned, North-Syria - Cilicia and Northern Mesopotamia.

are available. To avoid any confusion between the ceramic region of Northern Mesopotamia, mentioned above and already published as such, and the area considered below, we will call this last one "Jezirah"¹¹.

STAGE 3

If this stage is that of diversification of pottery as mentioned above, it nevertheless shows a rather simple and generalized situation concerning cooking and "non-cooking" wares.

*Tell Sabi Abyad*¹² (Fig. 3)

Tell Sabi Abyad, in the Balikh valley, is a good example of such a situation. Three wares are particularly interesting when considering this question:

1. The first, which was produced locally or in the near surroundings, is made of calcareous clay (mean CaO=16%), rather light in colour, containing abundant plant temper and rather thick (mean=12 mm). This ware represents more than 90% of the total pottery of the site. It will be henceforth referred to as Coarse Ware.

2. The second ware, surely imported, comes from ophiolitic zones which exist a few hundred kilometers from the site to the West or to the North. It is made of low calcareous clay (mean CaO=5%), dark in colour, containing no plant inclusions but mineral ones in varying size, quantity and type; it is much thinner (mean=8 mm) than Coarse Ware. This ware represents less than 4% of the total pottery of the site and it is called Dark-Faced Burnished Ware.

3. The third ware, the origin of which is still uncertain (though probably regional) is characterized by an abundant temper of crushed calcite; it is rather dark in colour and very thick (mean=13 mm). This ware represents less than 1% of the total pottery of the site; it will be referred to as Mineral Coarse Ware.

The Sabi Abyad assemblage also includes a ware made of calcareous clay without plant

inclusions, containing very fine mineral inclusions: we will not take it into consideration as such because it is technically rather comparable with Coarse Ware and not abundant, and therefore not really significant as far as the question of cooking and "non-cooking" ware is concerned.

In Sabi Abyad, black traces, which are very likely at least in most cases due to using the pottery for cooking, have been systematically recorded. The percentage of sherds wearing such traces is the following for each ware: 9% for Coarse Ware, 14% for Dark-Faced Burnished Ware, and 29% for Mineral Coarse Ware.

Mineral Coarse Ware shows the highest percentage of black traces and, together with this, the common shape characteristics of this ware must be mentioned: closed neckless shapes, that is to say hole-mouth jars, frequently bearing lug handles – characteristics which are quite rare in Coarse Ware, the common shapes of which are neck jars or open shapes (Fig.4-5), without any handles. Still, the main element to emphasize is the presence of crushed calcite as temper in Mineral Coarse Ware: this technique will be the most common for cooking ware in the Mediterranean world during the Neolithic, the Bronze Age and the Iron Age, and much later as well since it is still in use nowadays. It is rather unlikely that the use of such technique during the Neolithic in the Near East was merely due to chance. It is probably also not only by chance that Dark-Faced Burnished Ware pots have sometimes been reused for cooking in Sabi Abyad: black traces can be seen on neck jars, the broken neck of which has been sawn and smoothed, changing them into hole-mouth jars. As we previously mentioned the clay of this ware is low calcareous, and the selection of non-calcareous clays is another technique which will later take a large place in the production of cooking ware.

So it seems that in Sabi Abyad, during the third stage of pottery technique development, we can find the main characteristics of later cooking productions, except the fact that

¹¹ Jezirah means island, and represents the "island" between Tiger and Euphrates.

¹² Le Mière, Nieuwenhuys, 1997.

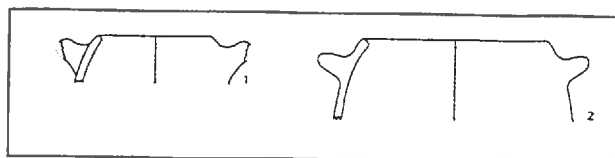


Fig. 4 - Mineral Coarse Ware shapes from Sabi Abyad (after Le Mière and Nieuwenhuys, 1976 : figs. 3.16 and 3.59)

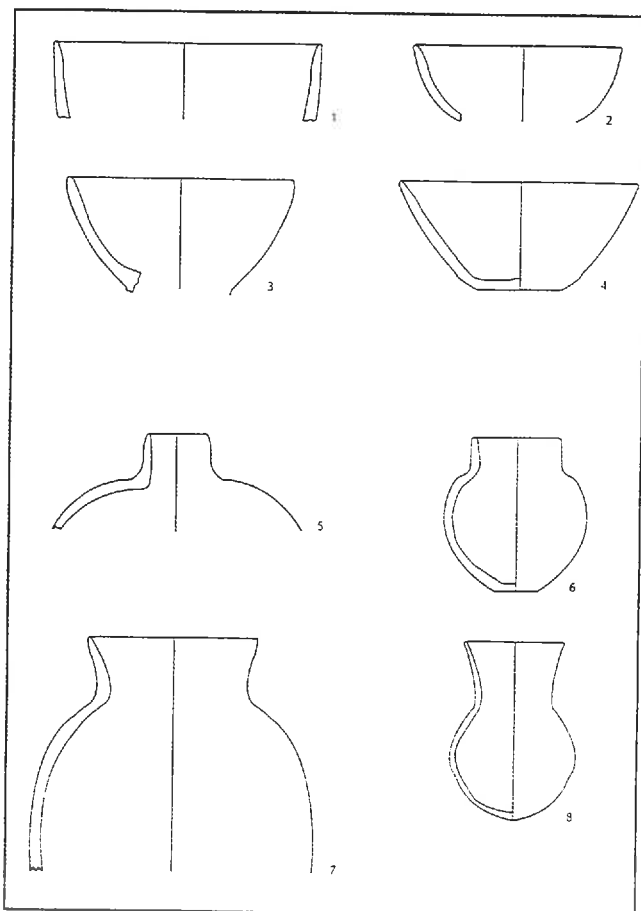


Fig. 5 - Selection of the most common Coarse Ware shapes from Sabi Abyad (after Le Mière and Nieuwenhuys, 1976 : figs. 3.7, 3.8, 3.9, 3.10, 3.12, 3.13 and 3.20).

Coarse Ware made of calcareous clay has also been used as cooking ware as suspected from the frequency of black traces – but less frequently, in 9% of the cases against 29% for Mineral Coarse Ware. Actually it is quite possible to use pottery made of calcareous clay for cooking if it has been fired at temperature low enough to keep a rather loose texture. We have not yet made any precise study of the firing temperature of Sabi Abyad Coarse Ware but we have done so for Tell Bouqras material, which will be presented now.

Tell Bouqras¹³ (Fig. 3)

This tell is situated in the middle Euphrates valley, a few kilometers south of the Khabur junction. The ceramic assemblage is in many respects very comparable to that of Sabi Abyad.

1. The main group of pottery, representing around 90% of the assemblage, is made of calcareous clay, light in colour and heavily plant tempered: it is locally made and technically the same as Sabi Abyad Coarse Ware. Another calcareous ware without plant inclusions and containing very fine mineral inclusions is present, as in Sabi Abyad, and for the same reasons we will not take it into consideration as a separate type.

2. A small group of pottery, representing less than 1% of the assemblage, is made of low calcareous clay; it contains large mineral inclusions and only few plant ones. It was imported to the site (Fig. 6). The shapes, rather closed, neckless, with frequent lugs and comparable with Sabi Abyad Mineral Coarse Ware ones, again suggest a use for cooking food and are rather different from the shapes of the other wares; the mineral inclusions are not crushed calcite but volcanic rock fragments.

Black traces which could be seen cannot be interpreted with any reliability as traces of use on the fire because of the presence of bitumen in large quantities and everywhere on the site. But the firing temperatures of the diverse wares have been studied, especially those of the Coarse Ware, which is made of calcareous clay, and which in Sabi Abyad was surprisingly used for cooking.

For this study we used different methods: X-ray diffraction to observe the new crystalline phases, quantitative analysis of calcite contained in the paste by X-ray diffraction and by calcimeter, and measurement of thermal expansion. These analyses have been processed for several tens of samples. The result for the calcareous samples is rather surprising since it shows a complete “indifference” to borders between very high fired pottery, which surely cannot be used for frequent cooking, and low fired

¹³Akkermans *et alii*, 1983; Le Mière, 1986.

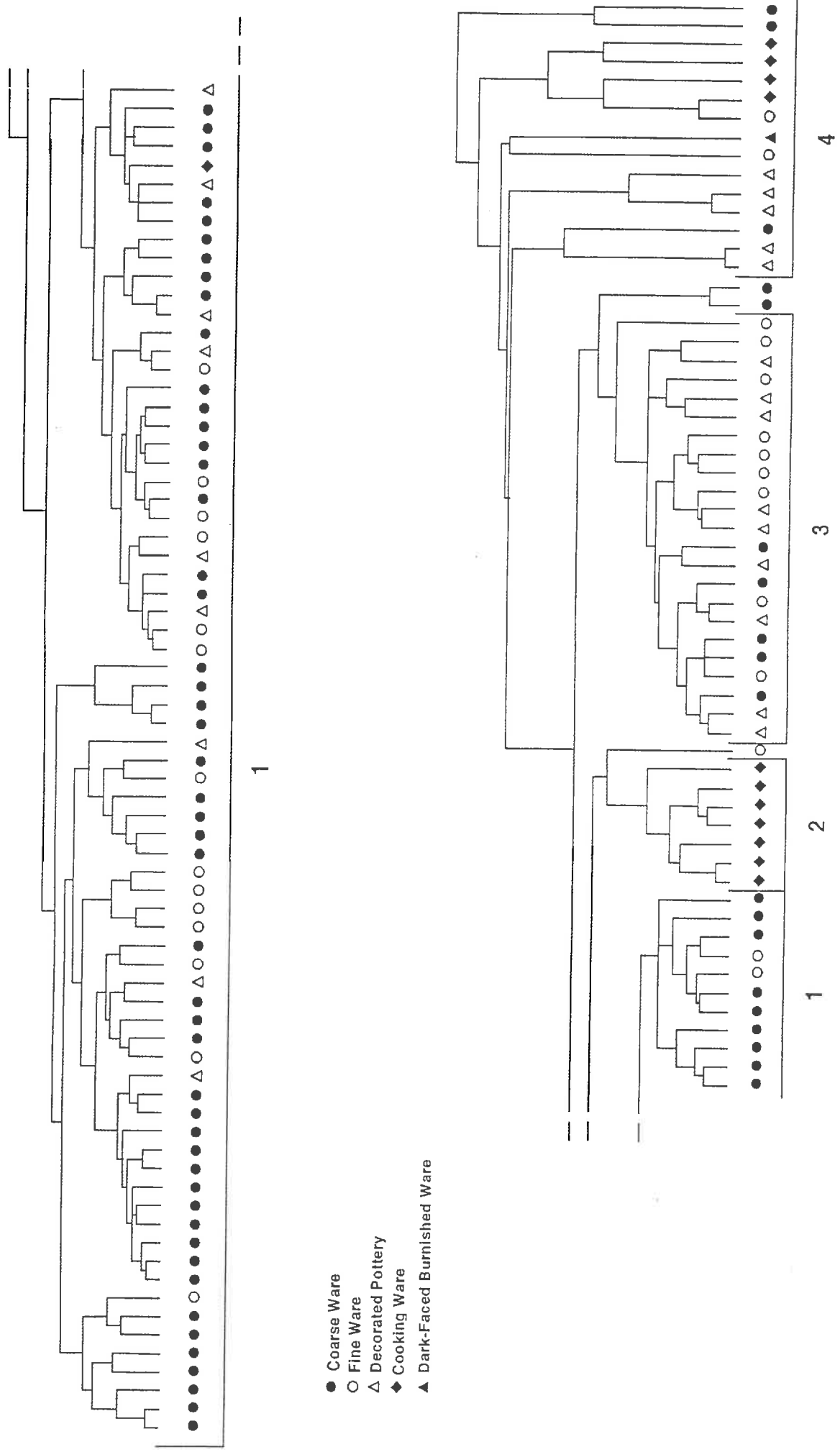


Fig. 6 - Cluster analysis dendrogram of pottery samples found in Bourgas.

pottery, which can be used for cooking: actually some of the firing temperatures are just slightly higher than 700°C while some others go up to over 900°C.

Opposite to that, we should notice that volcanic tempered pottery, suspected to be cooking ware, seems not to have been fired higher than 750°C.

This "indifference" to firing temperatures of calcareous production from Bouqras fits well with the fact that shape characteristics of this ware do not lead us to suspect that it was produced purposefully for cooking. It would more likely be a production for "non-cooking" uses, even if some pots might have been used at times for cooking in spite of the risk that they could be rendered useless. The calcareous production, the most common on the site, was abundant enough not to prevent taking such a risk. Anyway this use of calcareous pottery for cooking disappears progressively since a few hundred years later, in the Halaf period, this type of pottery was fired high enough to make it almost impossible to use it for cooking.

Other sites in Jezirah

The same situation as observed in Sabi Abyad and Bouqras can be noticed on several other sites in Jezirah during the third stage of development of the pottery. The pottery assemblage comprises on the one hand the most abundant ware, made of calcareous clay rich in plant inclusions, locally produced, which was mainly used for non-cooking purposes (the shapes suggesting no such use as well, though it may occasionally have been used for it); and on the other hand one or two rather restricted wares seemingly much better adapted for cooking since they contain abundant large mineral temper and their shapes are rather closed, neckless and bearing handles.

We can mention, among others, the case of Tell Kosak Shamali and Tell Ja'ade in the Euphrates valley (Fig. 3), where Mineral Coarse Ware with crushed calcite is quite comparable to that of Sabi Abyad: on these sites it also represents around 1% or less of

the total pottery, this percentage being still approximative for Tell Ja'ade.

In Tell Seker al-Aheimar, in the Khabur valley (Fig. 3), a small group contains volcanic rock fragments together with some plant inclusions (as in Bouqras) but it also exists at preceding stages, so we will examine it again later.

In Tell Halula, in the Euphrates valley (Fig. 3) a crushed calcite tempered ware is present. During the third stage its percentage is low, down from 11% to 2%, but it was much higher during the second stage, which gives weight to the interpretation of stage 3 assemblages in this area of Jezirah.

A comparable situation is found in Akarçay we will comment on it when considering stage 2.

In the East of Jezirah, in the Sinjar and to the South of this region (Fig. 3), so far no possible "cooking ware" has been identified, in spite of a systematic study of several sites. The pottery assemblages are composed of calcareous wares, mostly with plant inclusions, except extremely rare imported non-calcareous *Dark-Faced Burnished Ware* samples, which can hardly count as cooking ware since there are only two or three of them on each site. As in the more western sites of Jezirah, calcareous wares may have been occasionally used for cooking as suggested by the presence of black traces on some sherds, but we can tentatively hypothesize that the use of preparing food by long cooking or boiling, which requires pottery, was less developed in this region. We can mention the following sites: Umm Dabaghiyah, Tell Sotto, Telul eth-Thalathat, Kül Tepe and Yarim Tepe.

Other regions of the Near East

We have focused on Jezirah mainly because of the geological context. As a comparison we will look at the situation concerning cooking and "non-cooking" ware in Northern Levant, the western part of North Western Syria-Cilicia. We will be brief because evolutions are not so well documented and because they are more difficult to interpret, partly due to this lack of

data but also due to the geological context which is much less simple than in Jezirah.

In Northern Levant the most interesting site is Tell el-Kerkh in the Rouj Basin which is parallel to the Orontes valley to the East of it (Fig. 3). At the third stage of development of the pottery the assemblage is quite different from that of Jezirah since wares made of low or non calcareous clays are largely dominant. As a matter of fact, pottery made of calcareous clay and containing plant inclusions, very rare at the beginning of stage 3, does develop but still represents only about 20% of the total material at the end of the stage: the main ware is Dark-Faced Burnished Ware (75-80%). Such an opposition between Jezirah and Northern Levant is certainly not only due to the geological context because, if hardly any non-calcareous clay can be found in Mesopotamia, the reverse is not true and calcareous clays are available in Northern Levant together with non calcareous ones. This situation suggests the existence of technical traditions different from those of Jezirah.

As of yet the rather restricted available data prevent us from describing and locating these traditions more precisely but we may suspect that they influenced cooking ware production in Jezirah at the third stage and that this influence started during the second stage, which we will examine now.

STAGE 2

This stage is that of the first developments of pottery technique. Very varied situations can be observed which can be somewhat puzzling but could suggest phases of adaptation to techniques with different trials or borrowings which will lead, by diverse ways, to the model which seems to become generalized during the 3rd stage in Jezirah. This model is characterized, as presented above, by the supremacy of calcareous pottery, which would correspond to the emergence of a mainly "non-cooking" production, which is accompanied by cooking ware productions, very restricted in number, some imported but in some cases locally or regionally produced. The way this simple

situation could have been reached will be examined now.

Tell Halula (Fig. 2)

The sequence of Tell Halula, in the Euphrates valley, makes it possible to study the transition from stage 2 to stage 3 and, if the beginning of the sequence is not as yet as complete as that of Akarçay Tepe or Tell Seker al-Aheimar (see below), the available data are to date more detailed than those of both other sites. We mentioned above that in the course of the third stage crushed calcite tempered dark pottery decreased from 11% to 2%. But this decrease is the last step of much more important transformations of the assemblage since this ware accounted for up to 44% of the pottery at stage 2. Though we do not have absolute any means of comparison between the different phases of the site and between the diverse sites as well, such a high percentage can hardly be attributed to a much larger use of the pottery for cooking. Therefore the most significant element is the progressive replacement of this dark crushed calcite tempered pottery, which could possibly be a local or regional production, by a local light coloured ware made of calcareous clay and plant tempered.

The initial very high percentage of crushed calcite tempered pottery suggests rather strongly an influence coming from elsewhere. This influence could have been more or less assimilated, the low- or non-calcareous clay of the initial model being replaced by local calcareous clays not so suitable for cooking use. But this replacement, in the present case, would not have been of great importance, since the use of pottery for cooking, which was rather restricted at the third stage, was certainly still more limited at the second one. We cannot exclude the possibility that this use was more developed in other regions, particularly in the region where the technique of crushed calcite pottery started.

In Jezirah, the very restricted use of pottery for cooking, and its use mostly as a simple container, assisted in the development of other pottery techniques, mainly that of calcareous light coloured plant tempered

ware. That is to say that such techniques as crushed calcite tempering, which is needlessly complicated when considering the requirements of food processing at that time in this region, allowed the development of simpler techniques sufficient for "non-cooking" uses, which seem to have been by far the most important.

Akarçay Tepe and Tell Seker al-Aheimar

These two sites, the early pottery sequences of which are more complete than that of Halula, support the hypothesis formed on the basis of the previous site.

Akarçay, a few tens of kilometers upstream from Halula (Fig.2), is one of them. Stage 2 presents two phases (see above). The pottery of the first comprises exclusively crushed calcite tempered pottery, which was very likely imported to the site, as demonstrated by chemical analyses (Le Mière, Picon, to appear). This is replaced during the second phase of stage 2 by plant-tempered calcareous pottery, this replacement being progressive since we first see the introduction of plant tempering together with the crushed calcite ware, and then exclusive plant tempering, and it evolves so that by stage 3 we have the usual assemblage of coarse calcareous plant tempered pottery, often accounting for up to 90% of the material, together with small groups of pottery without plant temper, mostly finer.

Tell Seker al-Aheimar is situated in the Khabur valley (Fig. 2). As in Akarçay Tepe, stage 2 also presents two phases. The pottery of the first comprises exclusively pottery with abundant volcanic temper; during the second phase, plant temper is found sometimes and sometimes not associated with volcanic temper, the association disappearing by and by. This group of plant-tempered pottery increases throughout the second phase of stage 2 and will be largely dominant at stage 3, associated as usual with small groups of pottery without plant temper, among them a very small group of volcanic-tempered pottery. During the last days of the 2001 campaign a very few crushed calcite-tempered sherds were found, seemingly

earlier¹⁴ than the volcanic-tempered ones, which could suggest that volcanic-tempered pottery might be a local adaptation of "imported" crushed calcite ware¹⁵, but this has yet to be ascertained by enlarging the collection of this pottery and by chemical analyses.

Other sites in Jezirah

In some other sites the sequence is not as complete as it was in the sites just presented. Nevertheless whether it includes stage 2 and stage 3 separated by a hiatus between both, or only stage 2, the pottery assemblage can be situated by comparison with the technical model, largely widespread in this region at stage 3, of a dominant calcareous plant-tempered group associated with small groups of calcareous pottery without plant temper and also, in several cases, with a very small group of cooking ware, with large mineral temper.

Sabi Abayd is one of these sites: some deposits, not in stratigraphical continuity with those of stage 3, belong to stage 2, and probably to what can be identified now as a second phase of this stage: the pottery assemblage consists almost entirely of calcareous pottery, mostly plant-tempered. This is also the case at Sabi Abyad II, a small mound to the west of Sabi Abyad I, and at Tell Assouad, situated a few tens of kilometers upstream in the Balikh valley, as well as at other sites of the same valley (Fig.2). At all these sites, stage 2, again probably the second phase of it, is the only one known to date.

In Kumar Tepe in the Euphrates valley, more than a hundred kilometers upstream of Akarçay, the situation is somewhat more complicated. Only stage 2 is represented there, probably the second phase. The assemblage of pottery still includes about 30% of pottery without plant inclusions, a third of which is crushed-calcite tempered. The presence of crushed-calcite-tempered pottery among plant-tempered ware, which

¹⁴ In the very first levels above pre-pottery ones, cf. Nishiaki *et al.*, to appear.

¹⁵ The earliest crushed calcite pottery from Akarçay Tepe was imported to the site, see above.

was at first thought to be a mark of later development, seems actually to correspond to the end of the first phase of stage 2, when the assemblage was composed of only crushed-calcite-tempered pottery: so we could have at this site the transition between phase 1 and phase 2 of stage 2.

The Sinjar has not yet provided any reliable data for stage 2.

Other regions of the Near East

Concerning North Western Syria Stage 2 is surely present in Tell el-Kerkh but the available data are to date not quite sufficient to be interpreted regarding the question of cooking and "non-cooking" ware.

STAGE 1

Stage 1, the stage of the appearance of pottery, has been recognized on so few sites (see above and Fig. 1) that the available data cannot help the interpretation of later stages' assemblages regarding the question of cooking and "non-cooking" ware: they prove only that the pottery assemblages of stage 2 had predecessors.

TENTATIVE SYNTHESIS

Stage 3, where our presentation started from, is, in Jezirah, a period of unification and stabilization in the choice of raw materials but on the other hand it goes together with a strong diversification of surface treatments, shapes, decorations and sizes. Technically stage 3 is characterized by a production made of calcareous clay with plant tempering largely prevailing in all sites. Firing temperatures seem to be very varied (*cf.* Bouqras), which does not exclude the possibility of using at least part of this production temporarily for cooking food. This function could have been more systematically fulfilled by very restricted productions containing mineral inclusions (volcanic rock fragments or crushed calcite), some of which, and possibly most of which, were imported (*cf.* Bouqras). One may consider that individualization of cooking productions

starts at the beginning of phase 3 with the presence of mineral-tempered pottery reserved for cooking use (Fig. 7).

Soon after, calcareous productions were mostly high fired, making them unusable as cooking ware (Halaf period). At this point begins the production of characterized "non-cooking" pottery.

The preceding period, stage 2, is much more complex. It appears that in several cases the proportion of mineral-tempered pottery is decreasing, being more abundant in the first phase of stage 2, and that calcareous plant-tempered productions increase in number in the second phase of the same stage (Akarçay Tepe, Tell Seker al-Aheimar, Halula...). This evolution leads to the stage 3 situation.

The first phase of stage 2 is rather puzzling: it is characterized by the exclusive or very abundant presence of pottery the paste of which recalls that of cooking ware, which does not correspond, at least quantitatively, to a real need for cooking. This could suggest that this phase in the evolution of pottery technique could have appeared in Djézirah under the influence of another area where the same production, usually non-calcareous, was employed for both cooking and "non-cooking" uses.

The Jezirah population could have at first copied or imported pottery of this type. Then they would have progressively abandoned this model and started to use local calcareous clays with plant inclusions to make simple containers, some of them nevertheless being used for cooking. This restricted use of calcareous pottery for cooking food continues in stage 3 and disappears when individualization of "non-cooking" productions settles at the end of stage 3.

Regarding stage 1 pottery, they are still too scarce and sparse to be included in an evolution model.

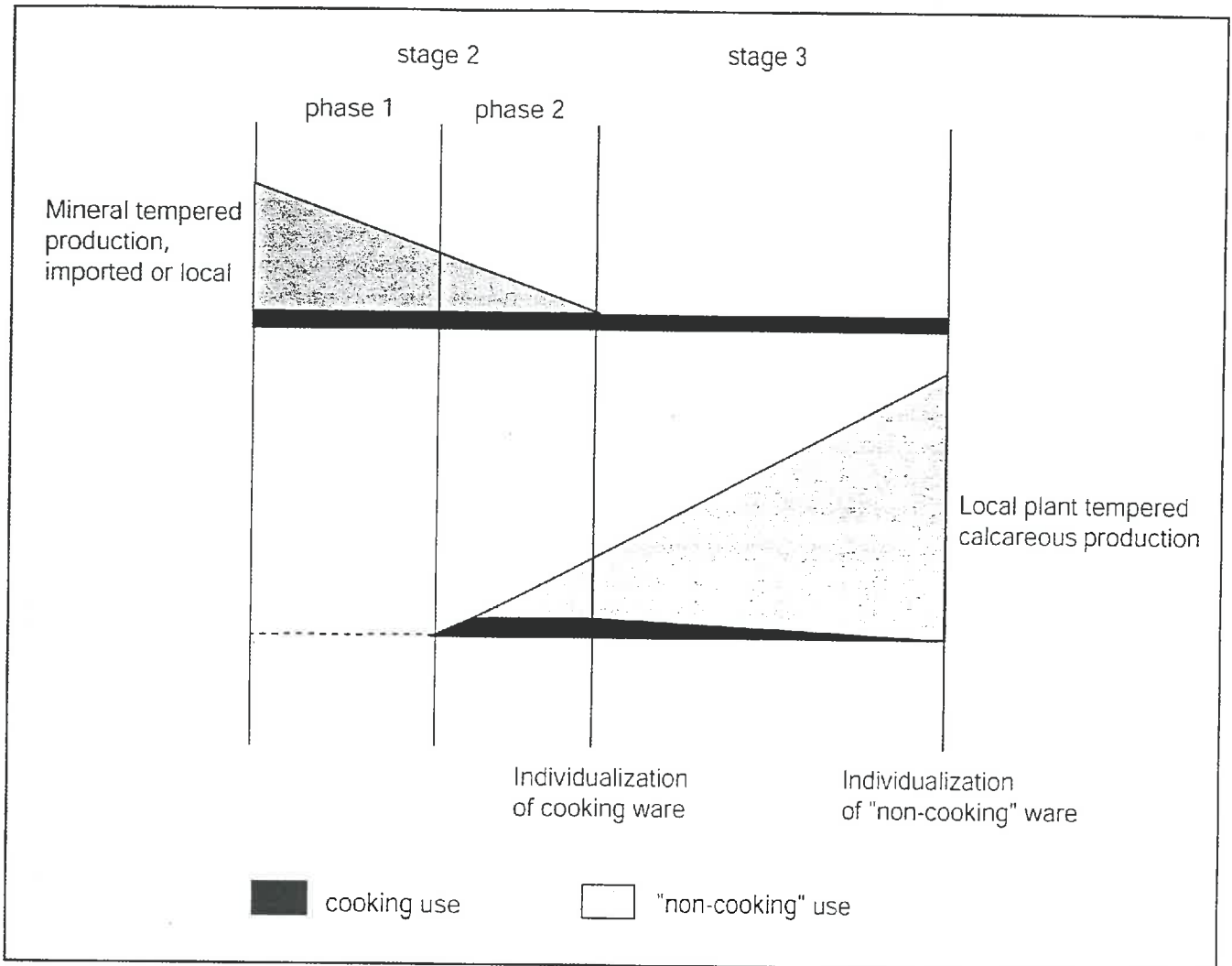


Fig. 7 - Schematic graphic showing the evolution of cooking and "non-cooking" wares during the first stages of development of pottery technique in the Near East.

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