

EARLY "NEOLITHIC" CHIPPED INDUSTRIES OF GREATER MESOPOTAMIA

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INTRODUCTION

This text is a modified version of the concluding chapter of my book, *The Eastern Wing of the Fertile Crescent, Late Prehistory of Greater Mesopotamia Lithic Industries*, in press.

A BREAKTHROUGH

It all began at the turn of the Pleistocene and Holocene when some of the local Protoneolithic industries began transforming into what I conventionally refer to here as the "Neolithic" industries. In the Levantine and Iraqi-Iranian provinces, this change took place around 8,300/8,200 years bc, whereas the Caucasian-Caspian province, of marginal significance for us, remained unaffected.

The reasons for this development remain unclear, but its outward manifestations are easy to describe. The traditional hunter-gatherer economy does not change in this time of breakthrough: the same grains continue to be gathered, hunters pursue the same game animals, the existing type of settlement persists and the only thing that changes slightly is the climate, which becomes milder. All this, however, does nothing to explain changes taking place in the flint industry.

In the classical Levantine area (Palestine), the local Late Natufian evolves into the Khiamian and Sultanian, losing its last geometrics (chiefly crescents) and acquiring Khiam points. Few changes occur in technology and among the other retouched tools (e.g., axes). The Khiamian is distinct from the Sultanian, and the two are different from related industries in areas outside Palestine: the Qermezian in Iraq and the industry from phase II of Mureibet in Syria. At least some of these differences have to be due to an early differentiation of Protoneolithic industries. We cannot be sure whether the Qermezian stems from the Natufian (it features triangles but not crescents, and its technique is different), while the Natufian assemblage from phase II in Mureibet also displays local peculiarities of its own.

Another large taxonomic unit that gave rise to local "Neolithic" industries is the Zawi-Chemi-the Post-Zarzian. It is easy to indicate significant typological similarities between the Zarzian/Post-Zarzian and the Mlefatian that followed. The differences between the two units are basically confined to the core formation technique and related features (mainly size and morphology of blades and, to a lesser extent, of the tools made from them).

Around 8,250/8,200 there appears in all of Mesopotamia the pressure technique, and quantitative changes can be seen in the group of microliths; like in the Levant, crescents disappear, being replaced in Mesopotamia by backed bladelets and backs + truncations. This phenomenon is in evidence in western Zagros (it is only there that the Post-Zarzian was discovered), with the late phase of the Zarzian remaining unknown in the east. However, since the "Neolithic" industry there is also Mlefatian (albeit with a local tinge), it is perhaps reasonable to presume a similar course of evolution there as well.

As I mentioned just recently, the Mlefatian was locally differentiated from its very beginning, dividing into at least two-three varieties - the eastern and the western - something that may be a reflection of the earlier differentiation of the Zarzian/Post-Zarzian substratum.

There are two other important things to mention. First, it is likely that the Zarzian/Post-Zarzian spread also to parts of the Mesopotamian Plain and Jezira (e.g., Tell der Hall and sites along the Khabur?). Second, the pressure technique appears to be allochthonous for the Zarzian/Post-Zarzian tradition, arriving from a foreign context (where from?).

Frank Hole's most recent studies provided a number of meager finds from along the Syrian Khabur which appear to fill in the territorial gap between the Zarzian and Natufian. Some of these assemblages are similar to those of both the mentioned units, while others are different. Undated and small in size, these assemblages do not allow definite interpretations, especially given the discovery of very early industries with geometrics in the Azraq basin, and the presence of geometrics in Qermez Dere. One must cautiously admit the possibility that there could have existed in the region a source of geometrics for the local "Neolithic" industries other than the Natufian and Zarzian.

The least clear situation is in eastern Anatolia where we so far know mainly rather late materials, which do however contain elements reminiscent of the older substratum. Namely, in the north, in the earliest Holocene, we see a dominance of the Caucasian-Caspian Trialetian tradition (Hallan Çemi and later Çafar "ancien" and Boy) which is also known from Nevalla Çori (in a vague chronological context). Areas further south (Anatolian steppe) lack evidence material dating to this period. From slightly more recent times, we know Levantine elements from this region (Çayönü, Nevalla Çori), the origins of which are shrouded in mystery. The origin of the shouldered points from Çafar "ancien", Çayönü-grill plan and Aşıklı as well as of "lanceolates" from Çayönü is likewise unexplained. Consequently, the areas north of Eastern Anatolia and the Zagros are the domain of the Trialetian, an industry which at that time, unlike other early industries, did not undergo any significant changes in its native territory, not counting the episode when trapezes were a predominant tool category (Belt, bottom?).

To sum up, we see (usually local) lines of development of local Protoneolithic industries into local industries described as "Neolithic," or local persistence of unchanged old industries well into the "Mesolithic" (Caucasian-Caspian province). The new industries usually occupy roughly (with few exceptions, cf. case of Sultanian?) the same territories as the older industries they stemmed from, apparently retaining or repeating the internal secondary differentiation of these older industries. Such a differentiation into local varieties is most

probably a partial reflection of actual differentiation of, for example, social territories, complete with their isolationism and autarkic systems of raw materials acquisition.

One important conclusion appears to rise from all the above, namely that the alteration of industries at the turn of the Pleistocene and Holocene was not profound enough to be seen as truly significant, much less revolutionary. There is nothing extraordinary in the change, and all we see is a repetition of a model of technological and stylistic modification that had taken place many times over in earlier times. The new industries we know from the period in question are of a "hunting" (in European terms - Mesolithic) character, no different than that of their predecessors. It will only be the changes taking place in the 8th and 7th millennia bc that will be of truly historic significance (e.g., the introduction of pressure technology in the east, or bifacial heavy duty tools in the west).

TWO ROADS (Map 1)

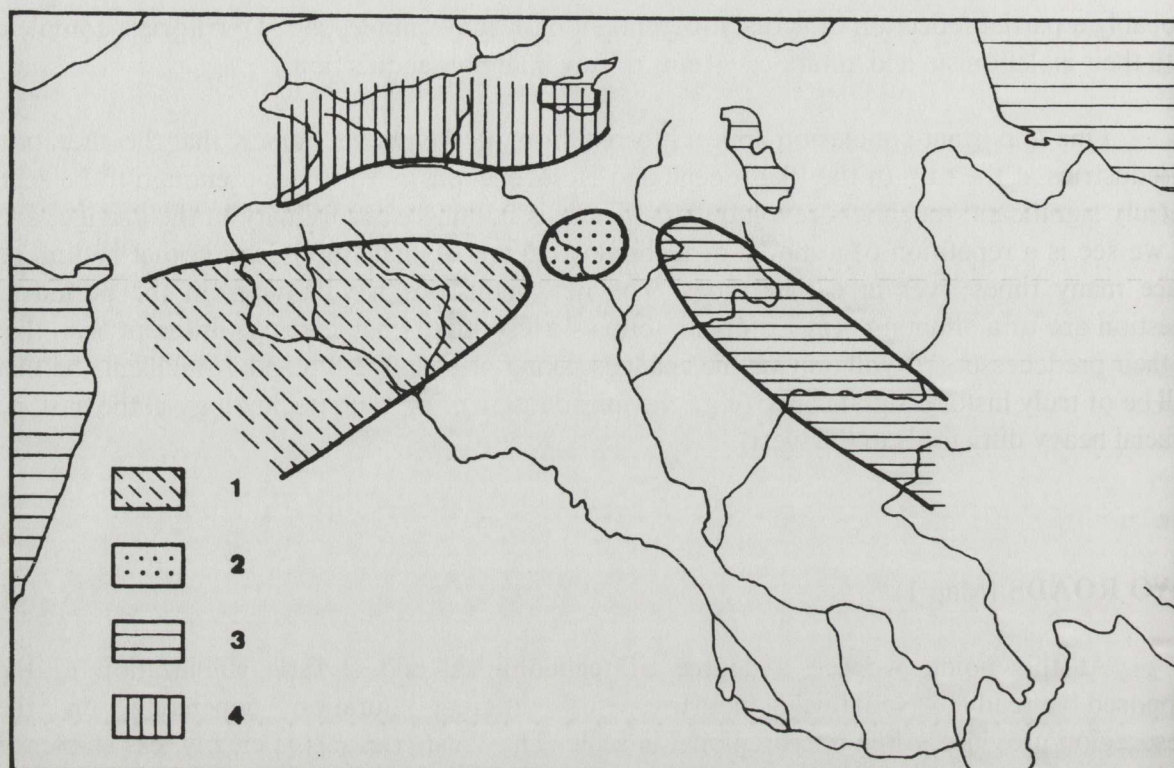
At this point, we see a degree of technological and stylistic stabilization of the supposed already "Neolithic" industries, of different duration depending on the mesoregion/province, often microregional in scale. The West (Levant) is clearly less stable, or perhaps more dynamic, and the period of stabilization there lasts several centuries (around 7,700 bc, the Khiamian industries are replaced by the Mureibetian, entirely as a result of local evolution), whereas in the East, the Mlefatian in its several (at least three) local variants, which emerged around 8,250 bc, will persist with few changes all the way to about 5,500/5,000 bc!

From the very beginning, we thus have in our area two distinct worlds: the more "progressive"/dynamic/restless/inventive West and the clearly conservative/"backward"/stable East. But is this character confined only to technology and stylistics of chipped industries?

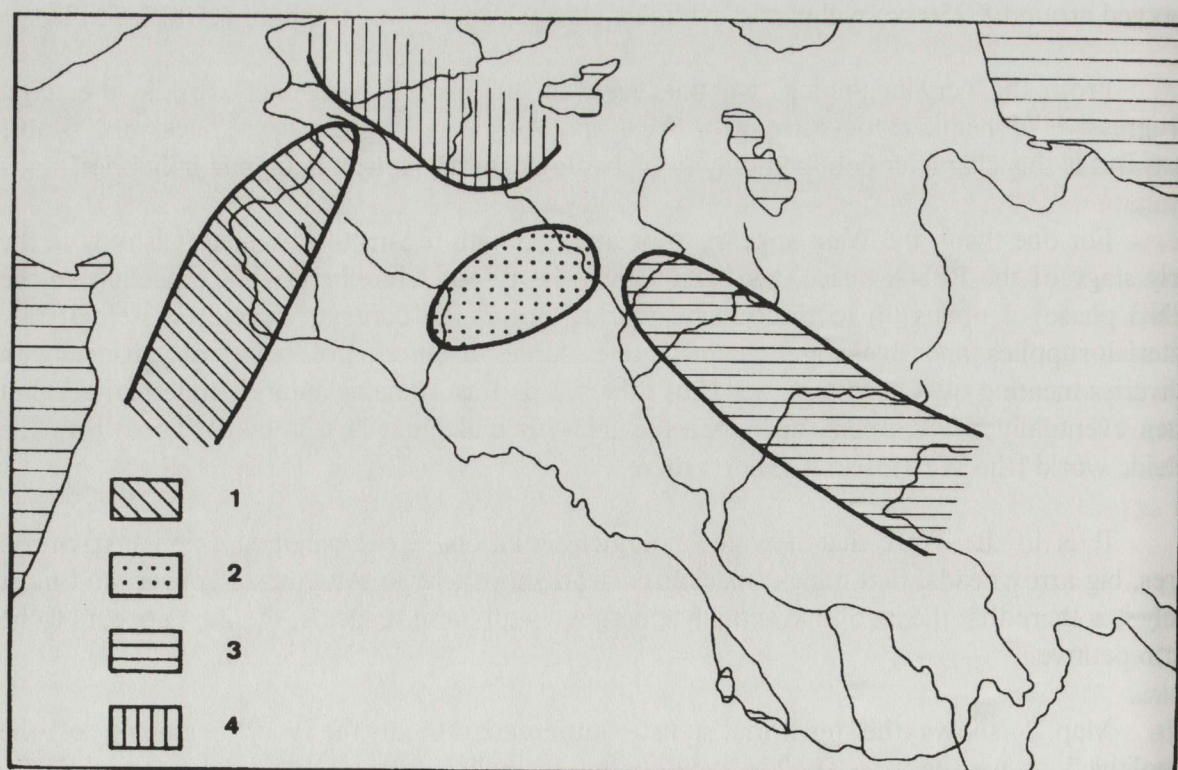
For one thing, the West appears to be autarkic with regard to raw materials only in the early stage of the PPNA phase, and later (since the PPNA Mureibetian but especially in the PPNB phase) it opens up to the outside world, long-range contacts develop, essential raw material supplies and exchange channels over large distances are being organized, with deliveries meeting own needs and needs of others. The East remains autarkic much longer, but when eventually it too opens up (since the mid-7th millennium bc), it takes more from the outside world (the West) than it exports there.

It is in the West that new technological solutions are developed (bipolar/naviform cores, big arrowheads, flint mines, specialized workshops); large settlements appear, and most likely it is there that the Neolithic actually emerges. In all these respects, the East appears to be just repetitive.

Map 1 shows the territorial/stylistic differentiation at the very beginning of the "Neolithic", as we see it today. The white spots, extending for example over parts of Jezira, are due in part to the paucity of evidence material; it is also probable that at least a part of the Mesopotamian Plain was settled in those times.



Map 1 Greater Mesopotamia between 8,300 and 7,700 bc:
1 - Khiamian, 2 - Nemrikian, 3 - Mletatian, 4 - Trialatian.



Map 2 Greater Mesopotamia around 7,600 bc:
1 - Mureibetian, 2 - Nemrikian, 3 - Mlefatian, 4 - Trialetian.

Four major taxonomic units may be distinguished in the period in question: the Trialetian, Khiamian, M'lefaatian, and Nemrikian. The last mentioned is known in these times only from a limited number of sites. We can see a functional differentiation of sites into villages and camps (e.g., Asiab and M'lefaat) - a situation which does not necessarily have to be strongly reflected in the chipped industries which continue to display a "hunting" character - and also the beginnings of organized production of particularly sought-after implements, taking place in specialized workshops relying on choice raw materials (broad blades made from "chocolate" flint in Nemrik).

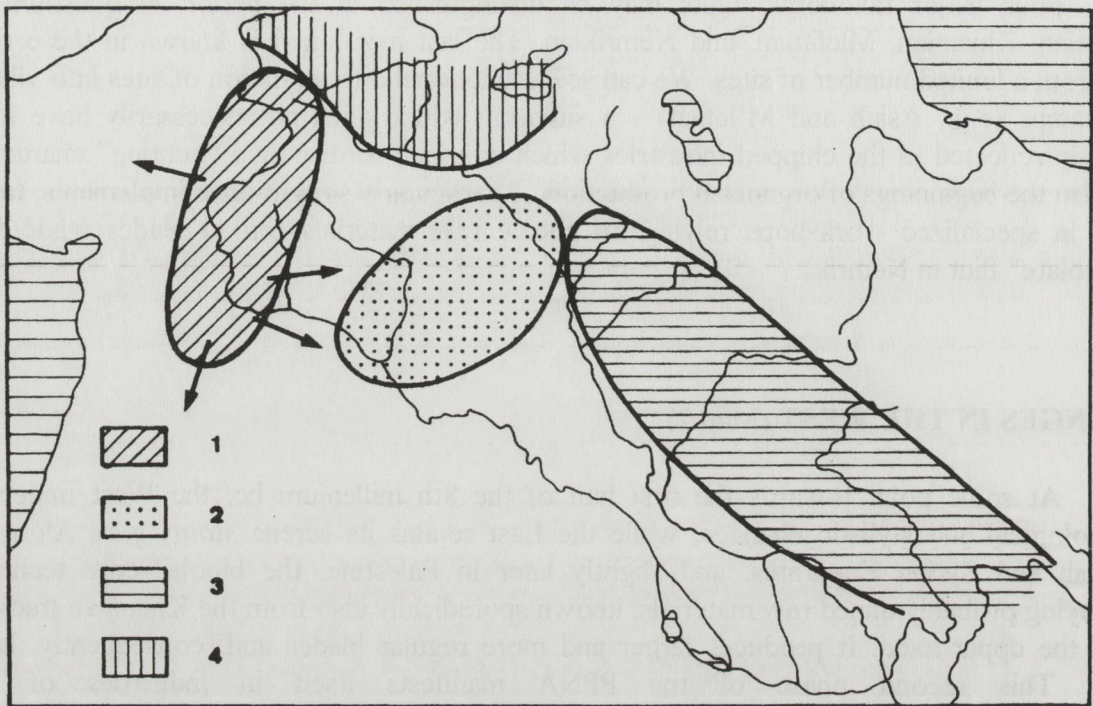
CHANGES IN THE WEST (Map 2)

At some point towards the first half of the 8th millennium bc, the West undergoes technological and stylistic changes, while the East retains its serene *status quo*. Along the Turkish and Syrian Euphrates, and slightly later in Palestine, the bipolar core technique employing probably mined raw materials, known sporadically also from the Khiamian tradition, gains the upper hand. It produces larger and more regular blades and, consequently, larger tools. This second phase of the PPNA manifests itself in industries of the Mureibetian/Aswadian/EPPNB type and is in evidence in a narrow strip of territory from Çayönü (?) to Israel. We do not know whether it also extends inside the Syrian Jezira, e.g., up to the Balikh river.

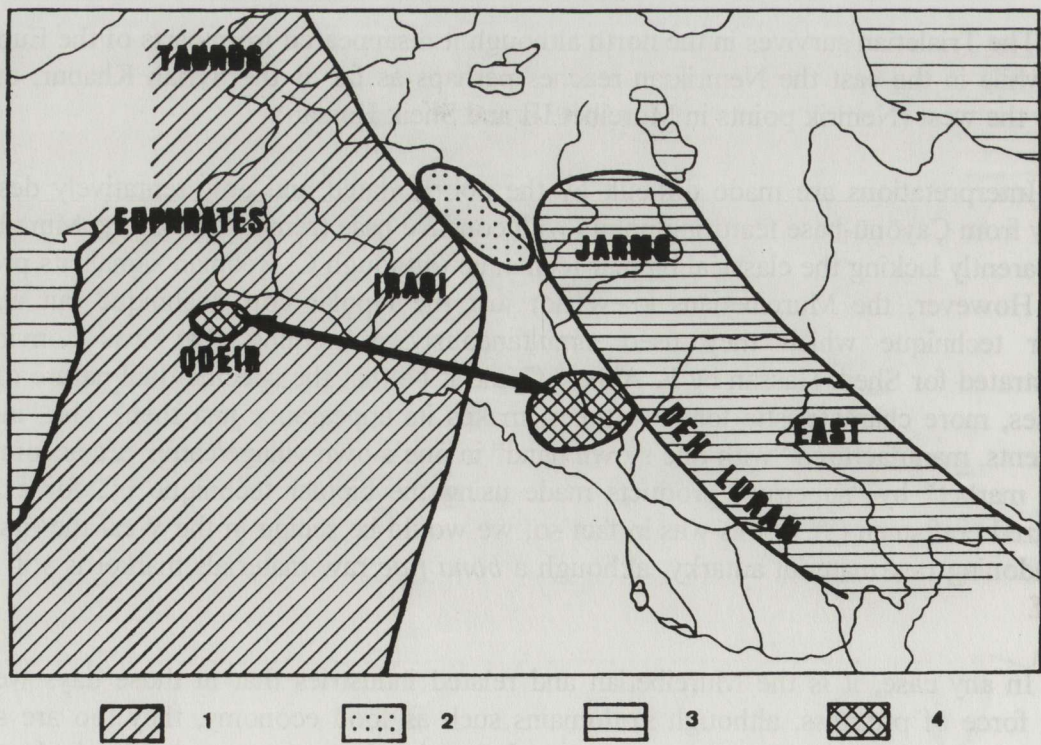
The Trialetian survives in the north although it disappeared from parts of the Euphrates basin, while in the east the Nemrikian reaches perhaps as far as the Syrian Khabur, or even more to the west (Nemrik points in Mureibet III and Sheik Hassan).

Interpretations are made difficult by the poorly dated and only tentatively described industry from Çayönü-base featuring points with concave base (reminiscent of the Mureibetian) but apparently lacking the classical bipolar technique (although C. Redman signals its presence there). However, the Mureibetians knew not just the bipolar core technique but also the unipolar technique which they used simultaneously, something that was convincingly demonstrated for Sheik Hassan by F. Abbes. Could it be that the specific dual nature of some industries, more characteristic for later times, makes its appearance just then? The "inferior" implements, manufactured "with one's own hand" in one's own village/camp, are accompanied "in the market" by "superior" products made using the bipolar technique by, for example, specialized craftsmen (?). If this was in fact so, we would be seeing in the West the first signs of abandoning raw material autarky, although a *bona fide* raw materials market is still a long way off.

In any case, it is the Mureibetian and related industries that in those days were the driving force of progress, although in domains such as food economy, they too are still far from being revolutionary developments and the industries themselves continue to be hunting in character.



Map 3 Greater Mesopotamia between 7,000 and 6,600 bc:
1 - Early/Middle BAI, 2 - Nemrikian, 3 - Mlefatian, 4 - Trialetian.



Map 4 Greater Mesopotamia between 6,500 and 5,500 bc:
1 - Late BAI and Post-BAI Agrostandard, 2 - Nemrikian and Late Nemtikian, 3 - Mlefatian and Late Mlefatian, 4 - Sawwan Industry.

NEW ORDER (Map 3)

More significant changes - in the West again - take place in the second half of the 8th millennium bc: a new, extremely dynamic higher-order unit, the Big Arrowheads Industries, also referred to as the PPNB (in the taxonomic sense), emerges from the Mureibetian and related industries. Its poorly researched initial phases - the Early (7,500-7,200 bc) and Middle (7,200-6,500 bc) - are represented primarily along the Turkish (?) and Syrian Euphrates and also in Palestine; we do not know whether it was also in existence in Jezira. BAI appears to be yet another local development stage in the Khiamian-Mureibetian sequence, although it is to be doubted whether the situation in eastern Anatolia was indeed that simple (e.g., the industry from Çaffer "ancien" with clearly Trialetian features, probably dating to before 7,000 bc, and its comparison with the similarly dated early industry from Çayönü-grill with clearly Levantine characteristics?).

The periodization scheme for the BAI proposed by Jacques and Marie-Claire Cauvin (who label it the PPNB), also does not necessarily have to reflect the situation in Anatolia (e.g., dates older than 7,000 bc for "PPNB Recent" from Nevalla Çori). BAI primarily represents a further refinement of the core formation technology, with the bipolar core developing into the highly specialized "naviform" core producing very large blades (larger than in the Mureibetian) with a straight lateral profile, serving to make equally large tools. Among these tools are the characteristic tanged points which replaced the points with concave base and Helwan points known from the Mureibetian.

Of course, this new type of industry required sufficiently large caliber of raw material nodules/tablets with suitable technological properties. The generally available pebbles occurring on the ground surface in many areas were no longer adequate and tool makers had to seek out and exploit deposits/outcrops of superior raw materials, a task by no means easy, considering that these could be found in some places only. They either had to build their village near or at the outcrop (a frequent case in the next evolution stage of the BAI, e.g., Ain Ghazal) or organize imports, also from very distant locations. In both cases it was necessary to mine the raw materials and also to at least pre-form it (if not to manufacture half-products), a process usually taking place in the vicinity of mines, prior to shipment to distant settlements. There emerges a highly individualized raw material system which will become an important element of the local "market" in the next period.

This elaborate system forces man to become more mobile, gives rise to functionally different sites of the same industry (mines, workshops, home assemblages), and triggers the development of interregional contacts. The autarkic and closed societies open up, and it is perhaps then that elements of craft/trade specializations make their first appearance.

The time is not just one of the West's technological advance, but also a period of a construction boom, with the large rectangular house making its appearance (Çayönü-grill, Nevalla Çori), a time when the first successful agricultural and animal husbandry experiments are noted; the chipped industry, however, is still of hunting character.

Unlike the dynamic West, the East of that time shows no perceptible changes in the local industries (Nemrikian in Jezira, Mlefatian further east) whose extent, understandably, is for us more clear than in the previous period, and whose territorial differentiation is more visible (the West vs. the Plain vs. the East).

Changes take place in different spheres of life, however. About 7,000 years bc or slightly later, there appears here the small rectangular house (many times smaller than in the West). In Zagros and some parts of the Mesopotamian Plain, these are the first ever permanent houses; further to the west they were preceded by circular structures. In that same period, in several places in the east, there were successful attempts to domesticate animals, but agricultural economy is still out of the question.

Overall, it is the more dynamic and open West that makes more headway. In the next period its influence will reach the East, adding momentum to development there.

The whole situation may be summed up as follows: the East, with its isolated social territories, enclosed by mountain ranges, is in the first half of the 7th millennium bc still autarkic in its raw material economy and extremely conservative in culture; the local industries (Nemrikian and three variants of the Mlefatian) have been persisting in unchanged forms for the past 1,500-1,800 years. We have to do here with hunters and gatherers comparable to the contemporaneous Mesolithic people of Europe. Interactions with the West (BAI) are very scant (e.g., the minimal amounts of obsidian) and new inventions (rectangular house, animal husbandry) appear sporadically or late in time.

At the same time, the West is inhabited by an already partly urbanized (e.g., Çayönü-grill, Nevala Çori?), dynamic and expansive BAI people, organizing a complex system of chipped raw material acquisition, with a different territorial organization (settlements along large rivers, in open, easily accessible and easily traversed spaces), already partly agricultural. These are the people who were the driving force behind neolithization, who in the next period embark on an expansion towards the Wild East, carrying the "banner of knowledge" to the people living there.

BIG BANG (Map 4)

The Big Bang takes place sometime around the middle of the 7th millennium bc: the old order in the East collapses and a new one begins to emerge.

What happens first of all is the downfall of existing barriers isolating human groups. Mesopotamian and Zagrosian communities, which till then existed in a model of autochthonous, inwardly oriented structures, begin to open up to outside influences, considerably step up interregional contacts, also ones involving large distances, some "give" various goods to others, and the others "take" them. In the process, a network of permanent "trade" connections is created, linking together manufacturing centers with their clients, sometimes quite far away,

These ties are best seen when looking at obsidian that was distributed on a mass scale (upwards of 40%, mainly in the form of blades) over distances of up to 350-400 kilometers, and to a lesser extent (5-10%) over distances of as much as 600-700 kilometers. It was extracted around the Van lake, processed initially into cores or, more frequently, still further into blades, and then shipped to villages in eastern Anatolia, Jezira, Mesopotamia and Zagros (but not to the middle Euphrates area). The blades were used in a variety of ways. Among others, they became the so-called Çayönü tools (as a result of working soft stone) and also side-blow blade-flakes and corner-trimmed blades, but were mainly turned into ordinary retouched blades. Cores were least plentiful: Toshihiro Nishiyaki counted just 78 in the entire area of interest to us (minus Çayönü and Magzalia).

The reason why comparable quantities of similarly formed obsidian did not reach the eastern-Anatolian steppe and Syrian Euphrates basin does not necessarily have to do only with the fact that it had to encounter there powerful competition from excellent local mined flint, near or next to which large villages were constructed in those days. I have in mind here the Late BAI settlements/sites, e.g., Nevalla Çori, the El Kom basin, Buqras, late Mureibet and Abu Hureira, which in most cases were erected on a virgin soil. An important consideration in their siting was no doubt the proximity (sometimes relative) to deposits of excellent flint raw materials. Another reason could have been the existence of some sort of important "political" boundary between the mountains and steppe (this boundary is still existing in our days).

Trade routes of the Euphrates can be traced based on other finds however. The north-south stretch, from the Taurus all the way to Jezira, is marked by the constant presence in Late BAI assemblages of small conical cores, usually made from obsidian, and infrequent bladelets from these cores (Hayaz, Halula, Abu Hureira, Caracol, Qdeir), all of which are atypical for these assemblages. They are not of course an indigenous part of the local BAI but rather an intrusion into this environment. Whatever the explanation for their presence, they are a trace of interregional contacts in this area.

The cores and their blades are of course reminiscent of the Nemrikian/Mlefatian tradition, and since they are usually made from obsidian, they can be an indication that the BAI "market" was also open to offers from flint knappers belonging to a foreign production and mining tradition hailing from the Van lake shores (?).

Other sections of the communication and trade routes are marked by the characteristic carinated stone bowls made from soft rocks, produced in several centers (including Buqras, Magzalia and Jarmo) and distributed over long distances, especially westwards along the Buqras-El Kom line and eastwards along the Buqras/Jarmo-Sawwan/Deh Luran axis, that is to say along the lower course of the middle Euphrates and then on eastwards along the middle Tigris. It is interesting to note that these vessels do not reach the interior of central Zagros along this route. Was this area still occupied by "savages"?

These are only the most readily apparent interregional communication routes of the day. Others could probably be discerned following studies of the flint raw materials used at that time. The very existence of these routes suggests that in the second half of the 7th millennium bc, we already have a well organized market, offering blades, usually made from excellent raw

materials, as well as the luxurious stone bowls requiring a great expense of labor to produce. It appears that all these items are the work of specialized producers operating near sources of the required raw materials, and that they could have perhaps been distributed over large distances by specialized middlemen-traders (?). Will this situation be repeated in later times in the case of the luxury Samarra-type ceramics? It is hard to imagine anything else.

All this is, of course, coming from the West, which commences its eastward expansion somewhere around the middle of the 7th millennium bc. At that time the BAI, till then confined to the Anatolian-Syrian section of the Euphrates, makes significant territorial gains in the east, reaching Syrian Jezira (Buqras, Abu Hureira, Damishliya) and Iraqi Jezira (Magzalia), as well as Mesopotamian Plain in later times (Sawwan) reducing the spread of the Nemrikian. The expansion is also directed southwards, to the oases of El Kom and Palmyra (El Kom 1, Caracol, Qdeir, Umm-el-Tlel). In the new territories there appear large villages that will continue to survive for centuries, often built up with large and small rectangular houses, sometimes even fortified (Magzalia).

The changes with respect to the previous situation are so profound that one cannot rule out (this being the position of Jacques Cauvin) the migration of human groups to the hitherto largely avoided ecumene, resulting in the replacement (or domination) of its indigenous inhabitants. The new settlements are as a rule erected on virgin soil, something that would support the proposed hypothesis. But this migration hypothesis could be challenged.

This BAI also represents a new quality as regards the chipped industry. It is based on excellent blades, often made from obsidian - and hence imported - usually lacking their cores, which are more often accompanied by flint blades with their parent cores on the site, usually representing more than one rock kind (the "better" ones probably imported from some not too distant location, and the "inferior" collected in the immediate vicinity of the site; cf. e.g., Buqras).

The supposed expansion proceeds along large water courses (Euphrates, Wadi Tartar, Balikh, Khabur, but not the Tigris?), with the villages in valleys being separated by wide expanses of uninhabited steppe which lacked water or deposits of good quality flint that could attract settlers.

The Late BAI, which we are dealing with here, expanded the range of its implements, producing large Byblos- and Amuq-type arrowheads, a wide variety of burins, truncations (made chiefly from flint), as well as retouched, natural and use-retouched blades (the majority being made from obsidian except of Turkish and Syrian steppe). Of special significance appear to be the triangular tools, most probably used as sickle inserts. Unlike its predecessors in the east and west, this Late BAI is no longer a "hunting" industry, displaying obvious "hunting-agricultural" features. At that time, these genuine sickle inserts are a complete novelty, and their presence correlates well with the results of botanical studies (presence of domesticated cereal grains) and architectural/urbanistic evidence, namely the large villages consisting of big houses (Çayönü, Çaffer, Nevala, Jarmo, Magzalia), perhaps inhabited by enlarged families. These houses are in marked contrast to the small multicellular structures existing at that time in the East (lower levels of Jarmo, Ali Kosh, Chaga Sefid, Guran, Jarri, etc.).

This process of settling eastern territories could not of course have taken place without contributions from the local substratum which is responsible for the isolated Nemrikian elements in the Late BAI in Syrian and Iraqi Jezira (Iraqi BAI), and which accounts for the territorial differentiation of the Late BAI.

Jacques Cauvin believes that the newcomers arriving to the Jezira area originated from Anatolia, bringing with them mainly obsidian. This may have indeed been the case, although intense western (Syrian) contacts are for us better documented for those times (carinated stone bowls, Sawwan-like arrowheads, transversal burins, etc.).

The western/north-western influences, so visibly confirmed by the just described expansion of the BAI and the almost complete elimination of the Nemrikian, had a different effect on the Mlefatian which occupied areas further to the east. First, these influences are signaled by abundant western imports of obsidian blades and bladelets, at that time present in fairly large quantities in the western reaches of the Mlefatian territory (Jarmo-aceramic, Shimshara-aceramic). Second - and in this case the western influence is harder to prove - towards the end of the aceramic period, there occurs an increase of blade dimensions. Third, around the turn of the aceramic and ceramic periods (ca. 6,000 bc), or a little earlier, the large rectangular house and carinated stone bowls (together with the Çayönü tools used to make them) appear in the western Mlefatian. These novelties had of course been known earlier in the west.

It may thus be surmised that around this time the western Mlefatian ceased to be a closed system, that since the end of the 7th millennium bc it began taking an active part in the market that was being maintained by the BAI, and that Jarmo embraced the agricultural model of economy. Not so in the case of the Mlefatian in eastern Zagros (Sarab) and of the remains of the Nemrikian along the Tigris (Telul, Ginnig). Although there too, like in the west, some blades become bigger, none of the western novelties make their appearance, the exceptions being the extremely rare single carinated bowls imported from distant places (and this when in the west Jarmo was producing them!).

The least clear situation is that of the Mlefatian in the Mesopotamian Plain which, although not surrounded by mountain barriers, is nevertheless relatively immune to Western novelties (only few carinated vessels in Ali Kosh).

Going back to the mentioned increase in blade dimensions in the Mlefatian (which in fact occurred in different environments in different times), a few words about blades, the basic and most important element in the industries of those times. Their significance - perhaps as unretouched knives (part of the secondarily retouched blades are in fact use-retouched) rather than as blanks for the production of retouched blades - is at that point in time crucial. This explains the special emphasis on the quality of raw material which was increasingly often mined, in many cases processed near mines and distributed in the form of finished blades (much less frequently cores) over large distances (obsidian). To be quite honest, it is not entirely clear to us why the people of those times were willing to go to all this trouble. Not everybody in the region, to mention but the Syrian BAI, was so demanding and nevertheless fared well. The

technological properties of obsidian probably did not play a vital role here since this raw material was eventually replaced by flint (in the 6th millennium bc).

As regards retouched blades, they are always plentiful in Near Eastern assemblages, and in quite a large number of the younger Mesopotamian assemblages, although not in all, they are more numerous than in older ones. Also, their indices appear to be negatively correlated with arrowheads indices (at least in the Iraqi-Iranian province), meaning that the greater the arrowheads index in an assemblage, the lower the retouched blades index, and vice versa. This could perhaps be a reflection of the early-late camp-village or hunting-agriculture (??) dichotomy, or perhaps respectively of mountain and lowland environments. Whatever the case, it appears that the best explanation here would have to do with functional differentiation of sites. This issue is important because it was precisely in the times of the Big Bang that agriculture was fully installed in the western Mlefatian (Jarmo).

Needless to say, I cannot claim with conviction that all the dichotomies mentioned above adequately account for the different roles of retouched blades in Mlefatian assemblages. I am not attempting to convince anybody that the correlation between a higher blade index and agriculture is a proven thing, but I do believe that the retouched blades-village correlation does indeed take place.

The mentioned increase in blade dimensions that occurs around or before 6,500/6,000 bc in the Mlefatian and whatever was left of the Nemrikian is of course part of the general development tendencies among "Neolithic" industries which eventually peak in industries of the Agro-Standard type.

CHANGES IN THE EAST

The time around 6,000 bc is a symbolic point marking yet another transformation of the cultural scene in Greater Mesopotamia. It is not of course the date of the revolution, since the Big Bang, which commenced around 6,500 bc, continued in an evolutionary manner, with this evolution being (imperfectly) symbolized by the transition from the aceramic to the ceramic period which took place roughly then. Various changes clustered around the year 6,000 bc.

The earliest ceramics make their appearance: of the Pre-Halaf and Proto-Hassuna/Umm-Dabagiya types in the West, and Jarmo and Muhammad Jafar types in the East. In truth, the appearance of ceramics is dated to more or less a single period only for the convenience of helpless researchers, while in reality there existed local chronological differences which we are unable to discern (lack of reliable ¹⁴C dates).

The increase in blade dimensions mentioned above had likewise not been dated precisely in industries of the East. The phenomenon is being described by contrasting aceramic assemblages (narrow blades) with the early ceramic ones (broad blades), and it perhaps did not start exactly in 6,000 bc and not in the same time in different regions.

Geometrics (trapezes, isosceles triangles, segments) appeared in the Mlefatian and Iraqi BAI around 6,000 bc or slightly earlier (Abdul Hosein); it is from this moment that the Mlefatian becomes the Late Mlefatian.

Significant changes take place in the lithic raw materials market. Already since the end of the 7th millennium bc, we observe a decreasing role of obsidian in the BAI environments in Syrian and Iraqi Jezira. It is being replaced ever more effectively by local flint or flint imported from nearby areas. This perhaps may be a sign that the recent immigrants have relaxed ties with their Anatolian roots. Characteristically enough, we see that they are gradually abandoning also imports of flint, relying to an ever greater extent on local raw materials (Buqras). We have a different situation in the western Mlefatian where in that same period obsidian imports increase in volume.

In eastern Zagros and along the middle Tigris, the raw material situation also changes. "Superior" raw materials make their appearance, being used to produce choice blades (Sarab, Tamerkhan), and this obviously outside sites. The trade in blades, an idea that occurred to people in the West already earlier, thus arrives also to the long-backward East. The isolationism of that area starts to crumble, and there is even an increase, albeit slight (ceramic phase in Deh Luran) of obsidian imports to the region.

The eastward expansion of Western ideas meanwhile continues: big villages resembling similar settlement in the West, consisting of large rectangular houses, some fortified (what was being protected and against whom?), make their appearance not just in Jezira but also in Mesopotamia proper. The aceramic Magzalia is followed by ceramic Jarmo (II,5), and later, in the second half of the 6th millennium bc, we will see Sawwan, Songor A, Choga Mami. The phenomenon spreads eastwards but clearly not over the entire territory of Mesopotamia and the Zagros.

The end of the first half and the middle of the 6th millennium bc brings further changes in various areas of Mesopotamian culture, including the flint industries.

The BAI continues to expand eastwards and south-eastwards, by about the mid-6th millennium bc reaching south: Iraqi Jezira (Umm-Dabagiya) and the Tigris (Hassuna Ia, in the Agro-Standard variant?), as well as areas lying quite a long way to the south-east (BAI elements in Sawwan). Going still further we have the Arabian Desert and even Qatar where the BAI tradition is carried by nomadic herders (around 5,000 bc), according to Jacques Cauvin and Danielle Stordeur.

One could not of course have expected a complex and expansive taxonomic unit such as BAI to evolve along a single road. It is enough to recall here that in Arabia and ceramic Çayönü and Halula the BAI retained its typological character for quite a long time, that in Palestine evolution affected mainly arrowheads, and that evolution in Greater Mesopotamia was different still. There - and we can say this quite confidently - a profound process of "neolithization" or "agriculturization" of the BAI industry took place around the middle of the 6th millennium bc. The Post-BAI Agro-Standard emerged, an industry rapidly discarding the "hunting" elements (arrowheads), displaying a high degree of standardization, with a

predominance of retouched blades and retouched truncations, most probably purchased in the market more often than made at home; this industry is accompanied by a rather crude home "subindustry" (Sotto, Kul). This is the final outcome of the full neolithization of north-western Mesopotamia!!

The demand for high-class tools for use in agriculture appears to have been so great that it forced a rapid development of a crafts market catering to the need of farmers. Given this fact, the industries in northern Mesopotamia were at that time more of a "shopping" than "home" character, and although they do of course represent a specific tradition, it would be a tradition of professional flint knappers supplying the farmers rather than that of the local farmers themselves.

As for the East, it was a bit behind in development, as was its custom since a long time before. Although around the middle or end of the 6th millennium bc there do occur some changes in the tool set, but these are of a cosmetic character. The backed pieces (arrowheads) disappear, being replaced by geometric arrowheads. We have agreed that this development signals the transition of the Late Mlefatian into the Post-Mlefatian, with this terminological convention serving only to clarify the nature of evidence material and not to describe a truly significant change.

At that same time there appears in the Mesopotamian Plain a new industry, the Sawwan (and in Caracol in Syria), being the result of contacts of the Iraqi-Iranian (Mlefatian?) tradition with the BAI. This is not of course proof that the Plain was settled only at such a late point in time.

Ideas conceived in the West do reach the East sooner or later, where they are adapted by some of the local Mlefatian, or rather Post-Mlefatian environments. The result of this are hybrids of the Sawwan industry type or industries of the Agro-Standard type appearing in some places on the Mesopotamian Plain in the second half of the 6th millennium bc (Choga Mami) or only at the turn of the 6th and 5th millennia bc (Sabz on the Plain and Faisala? in the mountains). They turn up as if selectively in just some regions (particularly in the mountains) and do not modify the existing set of implements. They appear to be connected to large villages of the new type, built up with large houses, which at that time were spreading eastwards. These are of course "agricultural" industries in view of their typology and structure - but also function, confirmed by palaeobotanical and archaeological facts (irrigation ditches in Choga Mami).

This is at last the final neolithization of some fragments of Mesopotamia. Elsewhere, e.g., in eastern Zagros, it would still be some time before the same kind of thing happened.

Remark: For more detailed characteristics of the mentioned industries (apart from my book mentioned above), cf. mainly the volumes of *Berlin and Warsaw Workshops on the Neolithic Chipped Industries of the Near East*, edited by H.G. Gebel and S.K. Kozłowski, Ex Oriente, Berlin 1997 and in press.