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Pre-Neolithic Economy

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Abstract

It is commonly believed that it is only from the Neolithic period that one can speak about the economy. Before the development of this economy of food production – based on farming and livestock rearing – the economy of hunter-gatherers – based on food procurement – is usually assumed to be limited to a subsistence economy. Our purpose is to demonstrate that even during the pre-Neolithic period, the economic activity had been already quite developed. Indeed, this period starts with the end of the last ice age and is then featured by a broad-spectrum economy, including varied food resources. Such change has induced less nomadism, increasing division of labour and human population growth. In turn, it has implied, on the one hand, trade, wealth accumulation, the implementation of property rights, including land ownership. On the other hand, it has stimulated labour productivity and human knowledge. Even if it was less developed, the pre-Neolithic economy was quite similar in nature to the Neolithic one's. Therefore it already contained the origins of our civilization.

Keywords : hunting-gathering, complex hunter-gatherers, pre-Neolithic, Neolithic revolution.

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Introduction

The Neolithic period spans from approximately 10,000 BP to 3500 BP. It ends with the onset of the metal age¹. It succeeds to the Mesolithic², a short period of time that has started around 15,000 BP, i.e. with the end of the last ice age.

In his book *Man Makes Himself*, 1936, V. G. CHILDE was the first to use the term “Neolithic Revolution” to feature this period of human history. He then highlights the revolutionary significance of the beginning of agriculture in the world. Indeed, the Neolithic is identified with the period when the production of food rather than the gathering became the dominant form of living. For CHILDE, therefore, food production was the greatest economic revolution in human history after the mastery of fire. Now there was a possibility of a storable food surplus for communities to use variously. It could be used during times of crisis, could support a larger population and could be exchanged. The domestication of plants and animals seemed to have brought about significant changes in the way people lived. A sedentary way of life was one of the main consequences of food production. Increase in population and in the size of settlements, use of pottery and weaving, greater social and cultural interaction among people are some of the features associated with the Neolithic. In most societies of the world, the Neolithic period preceded the emergence of a complex society and a civilisation. It is commonly believed that the origins of our current civilization directly derive from the Neolithic period. Indeed, Neolithic has come to represent a period of profound social change when human communities developed new mechanisms of control over land, labour and capital which resulted in social differentiation. Further social, economic and political complexities for instance in the form of civilizations would not have emerged without the existence of agriculture and animal husbandry.

The transition from hunting-gathering to agriculture occurred in several parts of the world. Several explanations have been stated. The first theory (V.G. CHILDE), called the “Oasis theory”, was on the suggestion that farming began in some parts of the Fertile Crescent (Southwest Asia) due to severe climatic changes. Beyond this deterministic explanation, for R. BRAIDWOOD 1960, the transition to agriculture was mainly due to a combination of changes in human nature and environmental circumstances. According to him farming began

¹ Copper, bronze and then iron.

² In the archaeological literature, the term “Mesolithic” is used for the European continent while “Epipalaeolithic” is used for the Levant and “Archaic” for the new world. Therefore, in order to avoid the use of so many different terms, and without loss of generality, we will use in this paper the generic term of “pre-Neolithic” to describe this period of history that spans between the upper Palaeolithic and the Neolithic.

in the “nuclear zones” i.e. areas that had abundant animal and plant species. L. BINFORD 1968, formulated a model that emphasised more on the demographic (population based) rather than environmental pressures. Finally, J. CAUVIN 2000, suggests that the Neolithic revolution was fundamentally a cognitive development where new conceptual structures, including religious beliefs, played a significant role in the development of the new sedentary societies that preceded the transition to food production.

While theories did contrast ‘food production’ from ‘food procurement’ as done by the hunter-gatherers, the more recent ones stressed the continuities rather than the contrast between hunting-gathering and agriculture. They were explaining the transition in systemic terms, i.e. in terms of analysing the interaction of environmental, demographic and cultural variables, they also emphasised on continuities. It is now widely accepted that the time of transition could be placed between 12,000 BP to approximately 5,000 BP. In other words, a mixed economy including hunter-gatherers and farmers has probably existed during thousands years. It is also commonly agreed that sedentism, which is closely linked to agriculture, was existing during the pre-Neolithic period. The Natufians settlements (in the Jordanian valley) or the Jomon culture (North Japan) are some famous examples that proved such claim.

In fact, even if there are several explanations of the Neolithic revolution and if the latter has taken time to be achieved, it is still commonly believed that the Neolithic was revolutionary, i.e. it was at odds with hunting-gathering societies. This belief is particularly strong with respect to economic concerns. Indeed, all the components of the economy, such as production, trade, wealth accumulation, private property (...) are in the literature solely associated with the Neolithic (C. RENFREW and P. BAHN, 2012). In other words, the pre-Neolithic societies are mostly considered as associated with a simple subsistence economy.

Our purpose is to demonstrate that social and economic relationships have been already present and quite developed in hunter-gatherers’ pre-Neolithic societies. For us, although it is certain that a difference exists between the latter and the Neolithic economy, it is only a difference of stage of development. There is no reason to consider, during the pre-Neolithic, a subsistence economy in which each individual would collect from nature and only for himself³ what he would need to survive⁴. There is also no reason to consider – as the

³ Such assumption implies an economy without trade.

⁴ Such assumption excludes wealth accumulation.

Physiocrats did in the 18th century – that the productive economy emerges only with agriculture, since many activities of production – through food transformation and storage and manufactured goods – were existing from the pre-Neolithic.

During the last decades, the archaeological literature has progressively adopted a point of view different from Thomas HOBBS' (1650) : “Life before civilization was nasty, brutish, and short!”. Indeed, for a growing number of archaeologists and anthropologists (T.D. PRICE and J. BROWN 1985, KEELEY, L.H. 1988, J.E. ARNOLD 1996, M. HARLE 1999), it is obvious that some hunter-gatherers societies⁵ were complex, especially during the pre-Neolithic period. Socioeconomic complexity is measured by means of several correlated variables : storage-dependence, sedentism, social inequality, and use of a medium of exchange. On the contrary, the economic literature on prehistory is less abundant and it concentrates mainly on the transition from foraging to farming (LOCAY, L. 1989, WEISDORF, J.L. 2005, MARCEAU, N. and G. MYERS 2006). As shown by J.L. WEISDORF (2005, 570), all these contributions can be examined through “*the relationship between the size of the labour force and the marginal product of labour in food provision*”. Despite this focus on the choice of techniques, most of the economic literature ignored all the other aspects which constitute the economy of pre-Neolithic hunter-gatherers' societies, except some papers (V.L. SMITH 1975, J.L. WEISDORF 2009, A.J. ROBSON 2010, R.A. GUZMAN and J.L. WEISDORF 2011) that do talk about a pre-Neolithic economy. Following the latter, our aim in the present paper is then to enlarge the economic analysis of pre-Neolithic societies.

The paper is organized as follows. Pre-Neolithic activities related to food and non food resources are defined in section 1. The division of labour they allow and its impact on human population growth are exposed in section 2. The section 3 explains how, despite the lack of food production, human survival has been warranted by the increasing division of labour and the induced technical progress. Trade and wealth accumulation are also respectively direct and indirect consequences of the division of labour (Section 4). Section 5 is devoted to the reasons and consequences associated with a more sedentary way of life of hunter-gatherers. Section 6 deals with the changes in social structure resulting from the development of economic activities when hunter-gatherers get settled. Section 7 concludes.

⁵ There are varying degrees of complexity, for instance, Jomon, Natufians, Preceramic coastal Peruvians, cultures of coastal Thailand, and Archaic peoples of the U.S. Midwest.

1. Pre-Neolithic economic activities.

The pre-Neolithic period is usually associated with an economic situation close to autarky where food resources are collected – not produced – and without surplus. It is therefore seen as what is often called a “subsistence economy” in which the people barely meet their everyday needs. It is seen as a factor of poverty. Indeed, the people may not collect enough surplus to trade with other groups, and sometimes not even collecting a surplus at all. Even if a surplus existed, trade would not be present since each hunter-gatherer could get directly from the nature what he would need to survive. Moreover, in a subsistence economy there is no specialisation such as the one implied by the division of labour. Therefore, trade of similar goods is of no interest. Wealth accumulation is also ignored. There is no storable goods, i.e. nothing can be accumulated. Even if they were able to accumulate wealth in various forms such as storable food, its transportation would be difficult or impossible given the nomadic hunter-gatherer way of life.

On the opposite, the Neolithic economy is featured by food production. In fact, such production is provided by farming and stock rearing. Therefore, according to the terminology used by the Physiocrats⁶ to describe agriculture, such economy should be termed “a production economy of food surplus”. The surplus provided by farming can be used in different manners: it can be partly consumed and partly saved when food is storable. Saving can be used for the next production or kept for the future in order to prevent from starvation. These various uses of the food surplus show that the income repartition is a central question in a production economy. In other words, all the current questions related to the economy – such as surplus and income repartition, trade and prices, saving and interest rate (...) – appear from the Neolithic revolution.

Such point of view was the most popular in the past and recent literature on prehistory. For us it is however unacceptable to restrict pre-Neolithic to a subsistence economy. In other words, we consider that an elaborate economy was already existing during the pre-Neolithic period and that it has simply been developed during the Neolithic. To demonstrate such claim, we consider all the pre-Neolithic economic activities and we divide them into two separate groups : those related to food resources and the other ones. The latter is quite numerous and

⁶ Physiocrats were a group of economists in the 18th century who believed that the wealth of Nations was derived solely from the value of land agriculture.

diverse. They include stones used to make weapons and tools. Different stones⁷ were used, including precious ones⁸. The selection of raw materials for making tools was very diverse. Materials other than stones were used on a much larger scale in an organized manner. These were bones, horns, antlers, teeth, tusk and woods. From the upper Palaeolithic, tools of these materials became, alongside stone tools, a standard component of the full toolkit. In addition, an important feature during the pre-Neolithic was the introduction of very small tools called microliths. These were used as independent tools or were joined with some handle, on a sharp edge or harpoon or heads of projectiles for specialized tasks (hunting, fishing...). It should be noted that all these tools and craft are produced. Many other non food resources were also produced, including habitation building⁹, watercraft building, making of leather clothes, the various expressions of art (...).

The second group of pre-Neolithic economic activities consists of food resources. By definition, food was wild during this period, i.e. it was not produced. Indeed, food procurement came from hunting, fishing and gathering. Food production, through farming and stock rearing, only appeared during the Neolithic. Even if wild food was produced by nature during the pre-Neolithic, a large part of it should be transformed before it could be eaten¹⁰. Therefore, there was already existing what in modern language we call a “food processing industry”. If during the pre-Neolithic there was no production of food in the Physiocrats’ sense, the food resources provided by this industry are clearly produced by man. Among the various transformations of wild food, some are of great interest since they transform perishable wild food in durable produced food¹¹. This produced durable food can therefore be stored for months or years besides the other storable food resources¹² directly provided by the nature. As shown by A. TESTART 1982, the existence of storable food has had a great influence on hunter-gatherers way of life, especially for explaining their transition from nomadism to sedentism.

Hunter-gatherers intensified, processed, exchanged, and stored large quantities of foods, ranging from acorns, bulbs, and seeds to dried meat and fish and manufactured large quantities of other goods, including beads, baskets, blankets, boats, and much more. If we put together on the one hand, the production of tools, craft and other manufactured goods and, on

⁷ Flint, quartz...

⁸ Obsidian, Jasper...

⁹ In addition to caves and rock shelters, hunter-gatherers built dwelling of various types.

¹⁰ E.g. grinding wild cereals to get flour.

¹¹ E.g. dried fruits, dried or smoked meat or fish.

¹² E.g. nuts, acorns.

the other hand the food provided by gathering and by the food processing industry, one can reach two conclusions. The first one is that, during the pre-Neolithic, the economic activities were numerous and diverse. The second one is that many of these activities were devoted to production. An economy with such features is far from a subsistence economy and is very close to the Neolithic economy. The transition between the latter and the former is therefore better described by continuity rather than by contrast or breakdown.

2. Division of labour and population growth.

It is commonly believed that hunting and gathering societies are usually nomadic, an inevitable result of their subsistence technology. They are assumed to have a low level of productivity. They have no full-time occupation and the division of labour is very limited since each hunter-gatherer can get directly from the wild what he needs to survive. If such vision was quite acceptable for the lower and middle Palaeolithic periods, we consider it is no more from the upper Palaeolithic. Indeed, we know that the end of the last ice age has occurred during the upper Palaeolithic and has resulted in deep environmental changes. The latter has modified the ecosystems and thus the food resources – animals as well as plants - provided by the nature became more diversified. Forests has replaced steppes and grasslands ; therefore, small game have replaced the herds of big mammals¹³. With a warmer climate, fish became plentiful and their proportion in human consumption has grown large. Analysis of flora and fauna suggests that the food quest became more diversified and specialized. Certain resources became more important to the diet, particularly nuts and shellfish. Likewise, resources that would have been previously avoided becoming incorporated into the diet.

Considering all these changes that have occurred during the pre-Neolithic, i.e. the apparition of an ecosystem featured by a large variety of plant and animal species, one can speak about a broad-spectrum economy. In such economy, since there is a possibility of exploiting a variety of plant and animal species, it is natural to consider that the division of labour is becoming more intensive. It could be determined by individual criteria such as age or sex. For instance, we know that hunting was a regular practice which was mainly the work of men while women were more involved in gathering of plant food and foraging. However, with a wide range of food resources, the division of labour became also determined by individuals' skills beyond age or sex. In addition to individual criteria, some social criteria¹⁴ also have had an influence on the division of labour. The increased size of the population also explains why the division

¹³ E.g. reindeers, bison, mammoths.

¹⁴ It could be some form of slavery or the existence of elites (...).

of labour became more intensive. Archaeological researches have proved that the size of the population has increased from the end of the Pleistocene. Indeed, from the onset of the Holocene, a warmer climate and wider food resources have improved human life and have extended life expectancy. With a larger population and a broad-spectrum economy, the pre-Neolithic economy was clearly featured by an important division of labour.

The increased division of labour has had many consequences on hunter-gatherers way of life. The first one is the growth of human population. Indeed, it is well known from A. Smith seminal work that the division of labour improves productivity, leading to larger amounts of production. The latter, during prehistory, means higher levels of available food and then an increase in the population level. It should be noted, as pointed out by J. DIAMOND 1997, that the increase of the population level also has a positive impact on the division of labour. Thus, there are continuous positive feedback effects between division of labour and population.

3. Technical progress and human survival.

The quest for food is obviously a crucial activity in every hunting and gathering society. Since it is commonly assumed that most of these societies have no way to store food for extended periods, the food quest must be fairly continuous in order to avoid starvation. The Neolithic revolution, i.e. the shift to food production is therefore presented as necessary to warrant the survival of humankind and population growth. By the domestication of nature, through farming and husbandry, man controls his own destiny and the society ceases to be primitive. For the pre-Neolithic period, the common view is different. Hunter-gatherers and food resources are considered as respectively predator and prey in a single dynamical system. In other words, the growth of human population was upward constrained by the carrying capacity of nature. It should be noted that this point of view has been popularised by Malthus in the 18th century when he was studying the interaction of population growth and crop production.

One way to avoid the scarcity of resources involved by increasing density of population is to consider that hunter-gatherers have had the opportunity to move into new territories. Indeed, population growth among the hunter-gatherers was continuous rather than occasional. This caused territorial expansion and infiltration of unused areas. However one can find a counter-

argument since all continents¹⁵ were occupied from 12,000 BP, restraining the opportunities migrations were offering.

If prior to the last quarter century, most studies of hunting and gathering societies emphasized the uncertainty of the food supply and the difficulty of obtaining it, a number of more recent studies, however, paint a brighter picture and indicate that they all secure an ample supply of food without an undue expenditure of time or energy. Such vision contradicts Malthus analysis and can be explained as follows.

We know that the onset of the Holocene epoch saw sudden and sharp variation in temperature and that has led to environmental changes. At this time, the hunter-gatherers adapted their subsistence strategy to suit the changes in climate as well as in animal and plant life. By this time many hunting-gathering groups had acquired knowledge about their immediate environment. Hunting and gathering activities now became most well regulated and specialised and demanded an intimate knowledge of plants and animals. The pattern of growth of vegetation of different types of plants and use of various plants for their survival, knowledge about animals, their life cycle, breeding patterns, habitat and food consumption was also available to the hunter-gatherers. The use of more efficient tools and other evidence indicates that in many parts of the world people were exploring newer ways of acquiring food. Given these environmental changes and human adaptation, it is then possible to explain why the growth of hunter-gatherers population was not restricted by food resources. For that purpose, we may refer to E. BOSERUP 1965 theory. According to E. BOSERUP, the increase in population contributes to intensive farming since population pressure stimulates human knowledge and technical progress in agriculture. The same theory can be applied to hunter-gatherers societies. The warmer climate and more diversified food resources have first increased the pre-Neolithic population. Then, before the population outgrows the stock of wild food resources offered by nature, hunter-gatherers used their brain to produce new knowledge and to introduce technical progress in foraging. Due to the latter, they have been able to extend their food procurement¹⁶ and therefore to support continuous population growth. For instance, native Californians used many intensification techniques and technological developments that stimulated plant growth, permitted larger wild seed harvests,

¹⁵ The American continent was the last one occupied by man around 12,000 BP or even before.

¹⁶ This can be explained by the use of new tools for hunting (atlatls, bows) or fishing (watercraft, fishnet) and by new food processing (desiccation, smoking) from which perishable food can be transformed in storable food.

and allowed storage and consumption of massive acorn harvests. Such example illustrates quite clearly that hunter-gatherers can create “protoagricultural” economies, manipulate the resource base, and generate large storable surpluses without ever domesticating plants or animals.

One remaining question is then to identify the origins of technical progress at this time. We know from A. Smith and all modern economists that the division of labour stimulates *learning by doing* from which technical progress occurs. Thus, we can see that the division of labour has two positive influences on the pre-Neolithic population level. On the one hand, labour specialization increases labour productivity and leads to a larger output. On the other hand, labour specialization leads to innovation through *learning by doing* and then to larger output too. Despite the lack of food production in the Neolithic sense, the pre-Neolithic population was able to grow continuously.

4. Trade and wealth accumulation.

Another major consequence of the division of labour – in addition to output increase and population growth - is that it induces interdependence between people. Indeed, a hunter-gatherer will become a specialist of a specific activity if and only if he will get from trade with other people the resources he did not produce or collect himself. In other words, the division of labour necessitates trade. Moreover, the more intensive the division of labour is, the more developed trade will be. In other words, the pre-Neolithic economy was featured by larger amounts and wider networks of trade, which is related to the increasing specialization of production. The studies of production in areas such as mines and quarries give greater understanding of trade networks. As explained previously, some of the stone tools could not have been used without some kind of an exchange mechanism. Rare stones were exchanged for surplus seeds or other non-perishable items. To cite an example, tools made from obsidian have been found all over southwest Asia. The foragers of West Asia and the Mediterranean region exchanged flint and Spondylus shells¹⁷ and precious stones as jadeite and greenstone. Apart from representing growth of economic contact between geographically separated areas, exchange of such materials also encouraged and strengthened social ties among people. Indeed, the valuables¹⁸ exchanged bought not only other commodities in ordinary exchange; they bought kinship ties with the exchange of daughters, military assistance if attacked, the

¹⁷ A Mediterranean mussel used for ornamentation.

¹⁸ E.g. bracelets, pearl shells, cowries, young women.

right of refuge if homes and property had to be abandoned, and emergency assistance in the event of poor harvest, hunting or fishing. Cultural materials (amber, sea shells, stone tools) often occur hundreds of kilometres from their points of origin indicating intergroup contacts over wide areas.

Besides the influence of the division of labour, three additional reasons explain why trade has grown larger during the pre-Neolithic period. The first one is linked to the population level. The higher this level is, the more numerous are economic exchanges.

The second one is related to the form exchange took place. One of the most significant aspects of complex hunter-gatherers is their increase in intensification of foodstuffs, meaning an increase in productivity and production due to technological advances, food storage, and the diversification of resources exploited. As a correlate, trade took place with some sort of barter. However, direct barter, i.e. the exchange of a commodity against another one is not easy, leading to a low level of trade. Therefore, trade can be facilitated if there is indirect or intermediate barter, i.e. if one use a standard medium of exchange or “primitive monies.” The latter must fulfil some specific conditions : it should be a durable good that can be stored, divided in small quantities, useful for all or at least most people. Since many pre-Neolithic manufactured goods¹⁹ can potentially be a medium of exchange, i.e. a single, unified, recognizable measure of value, we deduce that trade has increased rapidly during the pre-Neolithic period.

The third reason deals with the relationship between trade and wealth accumulation. Trade has been always a feature of hunter-gatherer societies ; however, with the development of foraging it increased greatly in scope and scale. With excess food and newly created specialist crafts available, societies had a greater capacity to produce goods of value to others. A new class of specialists emerged to facilitate the exchange of goods : the merchants. In many cases these people became enormously wealthy and powerful. By means of trade and resulted wealth accumulation, people can stored value, they can prevent themselves from future crisis and they are also able to own natural resources and land.

5. Sedentism, wealth accumulation and land property.

The key element determining the structure of a society is the subsistence technology on which its members depend. Because of their dependence on hunting and gathering, most of pre-

¹⁹ Rare stones (e.g. obsidian), microliths or mother-of-pearl shell are potential candidates which fulfill these conditions.

Neolithic groups are destined to be nomadic. They move for several reasons : search new food supplies, moved to eat a large kill, seasonal changes and conflict within the group. In the literature it is therefore commonly believed that economic institutions are not very complex in hunting and gathering societies. One reason is that the combination of a simple technology and a nomadic way of life makes it impossible for most hunting and gathering peoples to accumulate many possessions. The concept of private property has only limited development as things an individual uses constantly are recognized as his own, but land and natural resources are public.

This vision sharply contrasts with the one associated to the Neolithic period. During the latter, the domestication of plants and animals seemed to have brought about significant changes in the way people lived. A sedentary way of life was one of the main consequences of food production. Indeed, it is necessary for farmers to live close to their fields : they have to work everyday in their fields (ploughing, sowing, irrigating, harvesting) and to keep watch on them in order to protect against theft and to prevent from intrusion of herds and wild animals. Permanent settlements or a sedentary way of life are therefore closely associated with farming while nomadism is assumed to prevail in hunter-gatherers societies. Such restrictive vision can be challenged.

Indeed, during the pre-Neolithic hunter-gatherers have progressively shifted from nomadism to sedentism. As a way of life hunter-gatherers seem highly mobile though the area of movement was limited. It is believed that this movement was within a small region. Their movements were mainly restricted to specific territories usually 25 – 30 kilometres in all directions from a central water source or base camp. This situation occurred due to environmental shifts. Environmental changes affected the mobility of advanced hunter-gatherers, encouraged sedentism and caused population stress. As a result of environmental shifts, human population in certain parts of the world tended to settle in areas referred to as transitional zones between forest and steppe, savannah, river or coast or on the margins of upland and lowland. The transitional zones enjoyed an eco-system where there were a large variety of plant and animal species. In these zones, people could exploit a “broad-spectrum” economy. Many examples, such as the Natufians one, illustrate this shift. Indeed, the food gathering skills were mastered to such an extent by the Natufians that they could gradually afford to prolong their stay in particular regions. The Natufians who occupied the rock

shelters on Mount Carmel (Palestine) and the nearby open settlements reduced the extent of their foraging activities. This strengthened the trend towards a more sedentary pattern of life. Earlier it was felt that a site was permanently settled if it contained artifacts like flint sickles, blades, querns (milling stones) and facilities like storage pits. Research has shown that there have been villages without such tools and without farmers. For instance, during the Upper Palaeolithic and the Mesolithic advanced hunter-gatherers who adopted an annual migratory cycle and practiced seasonal nomadism, lived in camp like dwellings. Early Neolithic villages²⁰ were more dependent on an intensive collection of wild food. Food production was, therefore, not a necessary precondition for the emergence of permanent settlements. Once it is admitted that hunter-gatherers could be sedentary, it has many consequences on their economic activities. Indeed, the division of labour is more intensive since they can have full-time occupational specialties. People can trade, store value and then get wealthy. Evidence of social contact occurs from the late-Pleistocene, when the archaeological record shows a vast increase in property²¹. Even if there was no food production, we are far from a subsistence economy and very close to the Neolithic economy. Wealth accumulation is motivated because under a sedentary way of life, private property is possible and useful, including land ownership. Knowledge of the seasonal cycles of plants and animals, of the use of fire in resource management, of techniques of storing, drying and preserving foods, all combine to make life more sedentary. But with the accumulation of personal property and real estate would come more complex property right and contracting arrangements. The valuables exchanged bought not only other commodities in ordinary exchange ; they bought political stability in stateless societies, and a property right environment that facilitated specialization and ordinary exchange. Property rights thus precede the state and property included private goods such as land, fishing sites, and cemetery plots, but also public goods such as crests, names, dances, rituals and trade routes that could be assigned to more than one individual or group.

Additional reasons explain why hunter-gatherers became sedentary. We know that their knowledge improvement allowed some of them to be fishermen and since fishing enables people to stay in a particular place for a longer time, it allowed greater sedentism. Similarly, the knowledge improvement led hunter-gatherers to be able to transform more perishable food

²⁰ E.g. in Mallaha (northern Israel, inhabited around 11,000 BP.), Tell Mureybit (Syria) and Suberde (Turkey).

²¹ E.g. bows and arrows, atlatls, seed grinding stones, boiling and storage vessels, kilns for firing clay, boats, houses, villages, the domesticated wolf.

resources in storable food resources (A. TESTART, 1982). When the foods stored were staples, they could provide the predominant or exclusive diet during an important length of time, usually a season of low productivity. It should also be noted that trade and feasts were supported by stored foods, implying a surplus. One can go further by saying that permanent settlements are possible when food resources in specific areas are annually abundant or are seasonally abundant but can be stored and provide annual diet. Several food resources are consistent with the definition of such specific areas : fields of wild cereals, fishing hotspots, marine resources in coastal areas, acorns in oak forests (...). Other areas are also specific even if they are not directly linked to food resources. These include stones mines and quarries, wells²², oases (...). If we put together these specific areas related to food and non food resources, we get what we define as “remarkable areas”. It should be noted that owning such areas was economically and socially of great importance for hunter-gatherers. In fact, owning such remarkable areas is as much important for them as it is for a farmer to own his fields. Therefore, it is likely that hunter-gatherers have tried to own privately such areas and wealth accumulation was probably the means to.

6. Social structure : leaders, rules and inequalities

It should be obvious from the discussion so far that the shift from hunting-gathering to more scheduled food collecting techniques was backed by subtle changes in the social structure. A family as a unit of residence or working groups of men and women could have occupied the early settlements. As compared with upper Palaeolithic hunter-gatherers, pre-Neolithic or complex hunter-gatherers required a more corporate social structure. There had been an increase in economic activities pursued in their settlements. In the Upper Palaeolithic there was but one specialist, the sorcerer-shaman, while all other members of the community shared the same activities: the making of tools and other artefacts, hunting, fishing and so on. In the pre-Neolithic settlements, on the other hand, a variety of activities like hunting, fishing, pottery-making, weaving, stone work, carpentry etc. demanded a more rigorous division of labour among sexes and among different sections of people.

This also meant that there was now a need to evolve a few social mechanisms to prevent tension and control strife. The upper Palaeolithic or nomadic hunter-gatherers, among whom the kinship ties are far more flexible, perhaps coped with interpersonal conflicts and competition by moving in smaller bands. It is quite possible that complex hunter-gatherers

²² It could be wells of cold or hot water.

dealt with the social problems generated by a more sedentary life by seeking the intervention of a few individuals or a set of people who began functioning as arbiters in disputes. There was now a greater need for group effort to build shelters and storage facilities, to guard the community against threat of diseases related to crops and stagnant water, threat of loss of food through rotting or rodents and due to the threat of expropriation of the surplus collected. Individuals who helped the community to overcome these threats could have emerged as 'leaders'. The latter are also agents who take control of resources, labour, or external contacts (including exchange) to elevate their status. Therefore complex hunter-gatherers societies are possessing social and labour relationships in which leaders have sustained or on-demand control over nonkin labour and social differentiation is hereditary from those societies in which these relationships are absent. Complexity, then, relates most fundamentally to two organizational features: some people must perform work for others under the direction of persons outside of their kin group, and some people, including leaders, are higher ranking at birth than others. In addition, to reinforce their authority, the leaders have defined rules or laws in order to resolve economic or social problems. The application of such rules and laws has also contributed to the emergence of inequalities among people.

7. The pre-Neolithic origins of our civilization

We have demonstrated that, in order to reinforce the drastic changes induced by the Neolithic revolution, the societies of hunter-gatherers have often been oversimplified in the literature. Indeed, because of their dependence on hunting and gathering, most of these groups are destined to be nomadic, to have a low level of productivity and a limited store of other kinds of information. These characteristics lead to second-order effects. Nomadism and the low level of productivity combine to limit possibilities for the accumulation of possessions. The low level of productivity and the limited store of other technological information, especially information relevant to transportation and communication, combine to keep hunting and gathering societies small. The limited development of these technologies also limits contacts with other societies. These characteristics combine with the small size of these societies to keep the rate of technological innovation low. Finally, these second-order effects, individually and collectively, produce a series of third-order effects. These include the limited division of labour of hunting and gathering societies and lower rates of social and cultural change.

Most people think about hunter-gatherers as small bands of people roaming the landscape in search of food, incapable of ambitious projects, but over the past two decades archaeologists

have learned that many hunter-gatherers did the same things that only agricultural societies were supposed to have done. This paper challenges traditional ideas about early cultures and suggests that pre-agricultural, pre-ceramics hunting-gathering societies were more socially complex than previously thought. They built large buildings, had big settlements with permanent chiefs, developed elaborate artistic and technological traditions, made war, and managed their land to get as much food out of it as possible. In other words we have demonstrated that the common vision was restrictive and that pre-Neolithic societies were complex in an economic and social sense.

All these features allow us to say that the pre-Neolithic economy was not different, by nature, from the Neolithic economy even if it was less developed than the latter. Therefore, it is in this period of humankind that we can find the origins of our civilization.

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