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Surplus, storage and the emergence of wealth: pits and pitfalls

Christophe Darmangeat

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Social inequality before farming?

Multidisciplinary approaches to the study
of social organization in prehistoric and
ethnographic hunter-gatherer-fisher societies

Edited by Luc Moreau



CONTENTS

Contributors		vii
Figures		ix
Tables		x
Preface		xi
<i>Introduction</i>	Social inequality without farming: what we can learn from how foraging societies shape(d) social inequality? LUC MOREAU	1
Part I	Social inequality and egalitarianism in extant hunter-gatherer-fisher societies	
<i>Chapter 1</i>	Social inequality among New Guinea forager communities PAUL ROSCOE	21
<i>Chapter 2</i>	Mobility, autonomy and learning: could the transition from egalitarian to non-egalitarian social structures start with children? RACHEL RECKIN, SHEINA LEW-LEVY, NOA LAVI & KATE ELLIS-DAVIES	33
<i>Chapter 3</i>	The impact of equality in residential decision making on group composition, cooperation and cultural exchange MARK DYBLE	51
<i>Chapter 4</i>	Surplus, storage and the emergence of wealth: pits and pitfalls CHRISTOPHE DARMANGEAT	59
<i>Chapter 5</i>	Leadership and inequality among the Iñupiat: a case of transegalitarian hunter-gatherers ALBERTO BUELA	71
<i>Chapter 6</i>	Egalitarianism and democratized access to lethal weaponry: a neglected approach DUNCAN N.E. STIBBARD-HAWKES	83
<i>Chapter 7</i>	Adaptation and cumulative processes in human prehistory ROBERT H. LAYTON	103
Part II	Social inequality in Upper Palaeolithic Europe	
<i>Chapter 8</i>	Did secret societies create inequalities in the Upper Palaeolithic? BRIAN D. HAYDEN	117
<i>Chapter 9</i>	Responses of Upper Palaeolithic humans to spatio-temporal variations in resources: inequality, storage and mobility WILLIAM DAVIES	131
<i>Chapter 10</i>	A comparative perspective on the origins of inequality MATT GROVE	167
<i>Chapter 11</i>	Could incipient dogs have enhanced differential access to resources among Upper Palaeolithic hunter-gatherers in Europe? MIETJE GERMONPRÉ, MARTINA LÁZNIČKOVÁ-GALETOVÁ, MIKHAIL V. SABLIN & HERVÉ BOCHERENS	179

<i>Chapter 12</i>	Social ecology of the Upper Palaeolithic: exploring inequality through the art of Lascaux PAUL PETTITT	201
<i>Chapter 13</i>	Naturalism: a marker of Upper Palaeolithic social inequalities? EMMANUEL GUY	223
Part III	Social inequality in prehistoric Holocene hunter-gatherer-fisher societies	
<i>Chapter 14</i>	Reciprocity and asymmetry in social networks: dependency and hierarchy in a North Pacific comparative perspective BEN FITZHUGH	233
<i>Chapter 15</i>	Exploring fisher-forager complexity in an African context JOE L. JEFFERY & MARTA MIRAZÓN LAHR	255
<i>Chapter 16</i>	Unequal in death and in life? Linking burial rites with individual life histories RICK J. SCHULTING, ROWENA HENDERSON, ANDREA CZERMAK, GUNITA ZARINA, ILGA ZAGORSKA & JULIA LEE-THORP	279
<i>Chapter 17</i>	Did prehistoric people consider themselves as equals or unequals? A testimony from the last hunter-gatherers of the Eastern Sahara EMMANUELLE HONORÉ	293
<i>Chapter 18</i>	Social complexity, inequality and war before farming: congruence of comparative forager and archaeological data DOUGLAS P. FRY, CHARLES A. KEITH & PATRIK SÖDERBERG	303
Appendices to Chapter 9		321 (online edition only)

Chapter 4

Surplus, storage and the emergence of wealth: pits and pitfalls

Christophe Darmangeat

The question surrounding the origins of economic inequality is probably as old as social science itself, and can be traced back at least to Rousseau (2004 [1751]). Among materialist scholars, the most common answer, which until today has remained a reference framework, may be called ‘surplus theory’. Its most famous formulation, which was put forward in the first half of the twentieth century by Gordon Childe (1954 [1942]), can be summarized as follows: economic inequalities, which gave birth to the exploitation of work and the emergence of social classes, originated in the transition to agriculture and animal husbandry. This shift in the methods of production generated a food surplus which provided the base of the existence of all non-food producers: craftsmen, merchants, soldiers, priests and nobles. Childe’s surplus theory was not, strictly speaking, radically new; it incorporated several elements already developed by previous thinkers (for instance Turgot 1766; Engels 1954 [1878], 1972 [1884]). But it was considered as a synthesis based on the archaeological record – especially, the Near East and European sequence – which, in return, provided the logic for understanding this record. Despite the numerous criticisms it has faced, the concept of surplus remains a key reference in archaeological studies dealing with economic inequalities in prehistory (Bogaart et al. 2009; Morehart & De Lucia 2015; Bogaard 2017; Hastorf & Fowhall 2017; Kohler et al. 2017).

Before addressing ‘surplus theory’, it is necessary to stress that the debate about the emergence and widening of inequalities is often conducted in general terms which encompass the political dimensions of societies. There are obvious reasons for this tendency: the global evolution of human societies was marked by the development of wealth inequalities and political hierarchies; in other words, it was a general move towards the formation of social classes and States. These two aspects were of course not independent,

and it is tempting to treat them as a single phenomenon. This is particularly the case with the literature pertaining to chiefdoms, where the enforcement of political hierarchy is always strongly linked to economic differentiation, leading to the impression that one goes necessarily in hand with the other. Yet, it has long been noticed that the different dimensions of societies did not evolve everywhere in the same directions, nor at the same pace (Feinman & Netzel 1984). From a very global standpoint, if the economic and political inequalities appear as two aspects of the same general trend, as soon as one refines the picture, these two aspects are far from being synonymous. This is probably the most relevant objection raised by O’Shea & Barker (1996) or Testart (2005) against the neo-evolutionist classification. A telling example can be found in North America, with the comparison of the Iroquois confederation and the Northwest Coast societies. Although wealth was present in both sets, it was much more conspicuous and played a far greater role in the Northwest Coast. Yet, and despite their frequent qualification as ‘chiefdoms’, none of the societies of the Northwest Coast had elaborated a formal political structure. The power of their chiefs and aristocrats was based above all on their economic influence – even their famous ‘titles’ validated through the potlatches were not political functions or rights, but mere marks of honour and dignity (Drucker 1939). Conversely, the Iroquois, although much more egalitarian, are well known for their political constitution, with all of its formal elections, councils and procedures (Morgan 1922 [1851]). It is therefore necessary to stress that the origin of economic inequalities must be studied in itself, and should not be confused with the emergence – and even less with the further development – of political hierarchies.

We can now come back to surplus theory, noting that if its original formulation revolved around

agriculture, it has subsequently become increasingly associated with another element, that is, storage. This is the reason why this paper aims to answer two essential questions: 1) should the surplus (or the ability to produce a surplus) be considered as a necessary or sufficient cause for the emergence of economic inequalities and exploitation of work? 2) Which empirical and theoretical links can be established between storage and wealth? In other words, if storage matters, then why?

Surplus, exploitation and labour productivity

Some decades ago, the question of surplus raised an intense debate (Pearson 1957; Harris 1959, 1961; Dalton 1960, 1963; Rotstein 1961; Orans 1966), which ended without reaching any agreement. Some later contributions (Testart 1979, 1982a, 1985) did not receive much attention. In a recent publication (Darmangeat 2018a), we tried to take the discussion one step further. The main starting points can be summarized as follows:

1. As several scholars noticed, in its crudest formulations, surplus theory is a mere tautology. If the surplus is the part of the social product that is appropriated by the non-producers, saying that exploitation is explained by the presence of a surplus is calling the same phenomena by two different names, without providing any causation.
2. The only way by which surplus theory provides a real explanation is by stating that exploitation comes from the possibility of extracting surplus which, in the classical Marxist formulation, is equated with a rise of the productivity of labour.
3. In this framework, however, a minimal level of the productivity of labour provides only the necessary condition for the emergence of surplus. It says nothing of the reasons why the possibility became a reality. Nevertheless, it is almost always treated as if the possibility was a determination, so that the necessary condition was *ipso facto* a sufficient one. Another way of stating this idea is to remark that an improvement in provisioning may well result in an improvement of well-being or in a demographic increase, rather than in the emergence of exploitation relationships. In this way, Childe noticed the lag of several millennia between the birth of agriculture and the rise of a ruling class without giving any clear explanation.
4. Linked to the previous point, surplus theory also remains silent on the social forms under which inequalities and exploitation are supposed to have developed. Saying that they could emerge, or even that they had to, is not explaining why they took some definite shape and not others.

Given points 3 and 4, one can argue that surplus theory is, at best, incomplete. This incompleteness is also visible in the fact that the theory uses the same cause – the ‘overproduction’ in the food sector – to explain two very different phenomena, that is exploitation of the productive workforce in general and mere division of productive labour. Significantly, in Childe’s descriptions of the new social groups living on food surplus (1954 [1942]: 30–1), craftsmen are lumped with soldiers and priests.

In sum, the theory appears not only to be insufficient, but also to present some serious flaws.

Is egalitarianism a consequence of an insufficient labour productivity?

One of its main propositions is that the lack of economic inequalities and exploitation in hunter-gatherer societies is a consequence of the low level of their labour productivity. As Engels puts it, ‘At this stage human labour-power still does not produce any considerable surplus over and above its maintenance costs’ (1972 [1884]: 118).

It seems, however, that Marx and Engels had at least some hesitations on this matter. In chapter XVI of the first Book of *Capital*, Marx stresses that an adequate labour productivity is never a sufficient condition for the exploitation to take place; the producer has to be forced by some social mechanism to work beyond his own needs. He illustrates this idea with various examples, one of which is a primitive society of New Guinea where people satisfy their needs by 12 working hours a week, and where, if capitalism was introduced, workers might be compelled to work 6 days a week just to get the same product for themselves as before. The surprising (and seldom noticed) element in this passage is not the main idea, but the fact that the example chosen – a society where ‘sago grows wild in the forest’ (Marx 1909 [1867]: 585) – is clearly a hunter-gatherer one. Marx, then, did envisage in one of his major works published in his lifetime, that within such a society, an adult could possibly maintain himself and his family with a very limited amount of work, which would have left place for ‘considerable surplus’. To some degree, Marx seems here to anticipate Sahlins’ later developments on the ‘original affluent society’ (1972) and, for sure, contradicts Engels’ statement.

More generally, in all hunter-gatherer societies, even those living in the harshest climates, productive adults provide food for various unproductive members of society, being they young, old or ill. This means that even if labour productivity was too low for people to feed an exploitative class in addition to perpetuating themselves as a collective, an individual adult (say, a prisoner of war) would nevertheless be

able to produce significantly more than his own needs and thus, to be exploited.

The same conclusions arise from reasoning involving demography and the economic laws constraining these societies. Although the population dynamics of hunter-gatherers, and its possible specificities compared to agricultural people, gave rise to a considerable body of literature (Bentley et al. 1993; Pennington 2001; Bocquet-Appel 2011) there are few certainties. Several scholars, the most famous being Sahlins (1972), claimed that hunter-gatherers manage to maintain their population size below the optimum through cultural practices, thus ensuring that they can live relatively well without too much work. It seems, more probably, that hunter-gatherer populations tended to grow, albeit slowly, when resources became abundant and underwent Malthusian crises from time to time, which severely cut down their populations (Belovsky 1988; Winterhalder et al. 1988; Keeley 1988; Boone 2002). In either case, it can be argued that they could have sustained, to a certain extent, the maintenance of unproductive individuals. It is obvious in the first case. But, even in the second situation, the levy taken by some exploiters, instead of leading the whole society to disaster – the fate commonly predicted – might rather have resulted in a sustainable reduction of the number of their members. This counter-intuitive proposition is the consequence of the law of diminishing returns, which works in two opposing directions: if an increasing population, living in a given territory with given techniques, will face a fall of its labour productivity, conversely, a reduced population under the same conditions may well see its productivity rise. This gives way to an increased product, which may signify demographic growth... or the maintenance of some additional non-productive individuals. The mechanism exposed here is similar to the one described in an agricultural society, when taxes are imposed on the workforce and employed to pay the luxuries of the dominant class (Winterhalder et al. 2012).

Admittedly, it would be absurd to maintain that every society, whatever its environment and techniques, could bear the burden of an unspecified number of unproductive individuals. If, as we said previously, every worker, even in the poorest society, may normally produce a surplus over his own needs, it does not mean that this surplus is infinite. In a harsh environment, where a significant amount of work is necessary to get just enough food for the society to survive, this potential surplus margin remains narrow. Moreover, one should not oversimplify the way in which the ‘law of diminishing returns’ applies – and, conversely, the benefit in terms of labour productivity

in the case of reduction in the population below its carrying capacity. This benefit depends on the circumstances and, below a certain density, may well be equal to zero, especially under hostile climates. But, once again, this should not conceal the fact that in every hunter-gatherer society, even the poorest – and much more so in the affluent ones, as Marx already observed – the presence, to a certain extent, of unproductive exploiters was economically viable. If there were none, even when a certain social relationship was obviously marked by domination (Darmangeat 2015a), it should be attributed to other (and social) reasons.

Agriculture and the rise of productivity

The third line of difficulties which surplus theory presents pertains to the idea that agriculture increased labour productivity, thus allowing the surplus to come into being. An increased labour productivity may lead to three possible effects:

1. the increase of leisure time, as in the famous example of the Australian Yir-Yoront who invested the benefits of the steel axe ‘in sleep – an art they had mastered thoroughly’ (Sharp 1952: 20).
2. the increase of the product, whether this increase returns to the producers...
3. or is appropriated by a dominant class.

In theory, these effects should be identifiable, in particular the first one. In Marx’s thought-experiment with wild sago gatherers, the surplus would simply result from an external constraint, and in no way from an increase of labour productivity. With the exception of modern societies, addressing this question is extremely problematic as work duration can only be estimated with great uncertainties. However, in the last decades archaeology has collected various evidence on the advent of agriculture which all point in the same direction: that cultivation did not lessen the work effort. A comparison of the various figures taken from ethnological studies do not show that workload is smaller in cultivation societies compared to foragers – actually, the opposite is the case (Darmangeat 2015b).

Concerning the second possibility, the global well-being of populations does not seem to have improved with agriculture, at least in terms of health. If data concerning mobile hunter-gatherers are too scarce to compare their life expectancy with that of cultivators, the global health conditions seem to have worsened with agriculture (Steckel et al. 2002; Larsen 2003).

The only tangible result of the increase of labour productivity which is supposed to have followed the Neolithic revolution would thus have been the

formation of a dominant class living at the expense of the workforce. Although this formation stands beyond any doubt, an essential point is that it may have resulted from many causes besides an increase in the productivity of labour. Compared to the modest material culture of nomadic hunter-gatherers, the monumental achievements of the early States are impressive. But one should keep in mind that they were enabled, above all, by a huge expansion of the population – the tremendous gap between the population densities among nomadic hunter-gatherers and cultivators is a well-known fact. Several scholars have already noted that even in the early States, technical tooling in agriculture remained often very primitive and the amount of surplus-product which could be extorted from each individual worker very constrained (Mazoyer & Roudart 2006 [1997]; Trigger 2003: 313).

Of course, it is not argued that the technical progress from the Upper Palaeolithic to Antiquity was negligible. However, this technical progress mostly did not result in an increase of productivity of labour but rather of land, a phenomenon known as the ‘Malthusian trap’. Under this model, the improvement in the techniques of subsistence tends to bring about population growth; this, on the basis of a given technique, faces the law of diminishing returns, and while productivity of work initially rises through technical progress, it eventually falls back to its starting point. In a somewhat provocative formulation, it is sometimes said that during earlier millennia, technical progress did not serve to feed the poor better, but only to feed more poor per square kilometre. This process is at the core of what archaeology often calls ‘intensification’, although the precise meaning of this word has been subject to much debate (Boserup 1965; Kayser & Voytek 1983; Bender 1978, 1981; Kirch 1994; Morgan 2014; Morrison 2014). This also explains why a careful ethnologically based comparison between foragers and cultivators leads to the conclusion that Neolithic-like agriculture shows no better performance in terms of labour productivity (Bowles 2011).

In actual fact, and contrary to an opinion sometimes supported elsewhere (Wood 1998; Galor & Weil 2000; Clark 2007; Ashraf & Galor 2011), this conversion of productivity of labour into productivity of land was not complete. Part of technical progress was devoted to production that had no impact on the number of producers, starting with the luxuries of the developing dominant class (Wu 2015; Svizzero & Tisdell 2015). These productions represent a partial escape from the Malthusian trap, and in this respect, it is possible to say that surplus was much more a consequence than a cause of the emergence of wealth, economic inequalities and exploitation of labour.

If productivity of labour had a much lesser effect on the profitability of labour exploitation than commonly thought, it should be noted that the productivity of land, for its part, had a positive impact that has often been overlooked. Productivity of land affects the density of a population and therefore, the cost of oversight and control of labour power. We said previously that economic exploitation was formally possible among hunter-gatherers, but there is no doubt that extracting a surplus-product from a nomadic hunter would have represented a considerable cost compared to the yield. Conversely, sedentism and the much higher population densities it allows made political and economic control – without which exploitation is impossible – much easier. In economic terms, it is probable that the gross profitability of exploitation benefited less from the rise of productivity of labour than the net profitability benefited from the rise of productivity of land.

Why storage matters?

Another debate developed some decades ago, when some scholars advocated taking into account the ethnographic – and, most probably, archaeological – cases of so-called ‘complex’ hunter-gatherers who had developed high levels of economic differentiation. These hunter-gatherers, firstly those of the Northwest Coast, showed that the demarcation between economically egalitarian and non-egalitarian societies was not exclusively linked to agriculture, as it was commonly said, but rather to storage (Testart 1982b; Ingold, 1983).

This shift in perspective was of considerable importance, and raised two sets of questions. First, on the empirical level, to what extent was there a relationship between the practice of storage and the presence of economic inequalities? Were both phenomena strictly correlated or were there exceptions? Second, if storage is indeed related to wealth inequalities, what are the causes involved? We will begin by addressing the second question, assuming that if there are a few certain or possible exceptions to the empirical adequacy between storage and inequalities, this adequacy is widely ascertained and provides a solid starting point.

What kind of ‘surplus’ is storage?

First of all, two points about the relationship between storage and surplus theory have to be clarified.

It could be argued that storage only modifies this theory on a secondary point, by simply changing the factor which increased the productivity of work (storage instead of agriculture). In itself, such an adjustment would raise no particular problem. However, for obvious reasons, such an opinion was seldom argued; instead, one more often reads that

storage is, by nature or to a certain extent, a surplus (for instance, Bogaard 2017).

This point illustrates a recurring ambiguity. A 'surplus' is an excess of one quantity over another, but one should never use the word without specifying which quantities are involved – a problem which has always greatly contributed to obscuring the debates on this topic. According to Marx or Childe, the surplus is the excess of production over what the producers receive – that is the reason why it can be called 'social'. This is significantly different from the physiological surplus which was referred to by cultural ecology, and which names the excess of production of a given society over the biological needs of its members. Stocks, in a sense, are also a 'surplus': the excess, at a given time, of past production over consumption. But it is easy to see that they are, by nature, neither physiological nor social surplus. Speaking of storage as 'surplus' is therefore not illegitimate, but it introduces confusion. At worst, by lumping together storage and exploitation of labour under the same designation, it hides the fact that both phenomena are analytically different, and that the empirical link between them has to be explained.

Several scholars have noticed the problem; Arnold, for instance, rightly stressed that the question is not storage in itself, but the control of others' work (1993: 93). Yet, the question remains why both phenomena are so often, if not always, linked in the empirical record. The same preoccupation led others to propose a differentiation between 'normal surplus', corresponding to the needs of the immediate producers in order to face the resource cycle, and the surplus strictly speaking, which can be appropriated by a ruling elite or, at least, take the form of wealth (Halstead 1989; see also Kirch 1984; Bogaard et al. 2009; Kuyt 2015; Winterhadler et al. 2015). This discrimination is based on the idea that social surplus comes necessarily in addition to the product managed by the households. It may be useful, in particular, to identify social processes often related to chiefdoms in the archaeological record (Wesson 1999); yet, it does not provide any real clues of the reasons why the 'normal surplus' might or should give birth to a social one – in other words, how and why storage led to economic inequalities and exploitation of labour.

From storage to wealth: three hypothesis

To this riddle, three main answers have been given.

The first one, probably the first that comes to mind, is based on the physical properties of stocks as durable and movable. They may thus be appropriated and centralized by some hierarchy – one possibility is the case of collective supplies being at first administered by leaders for the common sake, and then used

for the selfish interest of their managers. This idea seems to be as old as the discovery of the importance of storage for economic inequalities itself (Testart 1982a), and was recently put forward to explain why economic inequalities arose when the crops were grains, and not tubers (Mayshar et al. 2015). While it may contain some truth, this reasoning states, at best, a necessary condition: it does not explain why the households agreed to be deprived of part of their production, or how they were compelled to produce it in addition of their needs, a question rightly raised, for instance, by Arnold (1993). Neither does it explain why, even in the absence of a political hierarchy, numerous societies display important inequalities of wealth between households.

Another hypothesis was advocated by O'Shea (1981), under the name of 'social storage'¹ (see also Rowley-Conwy & Zvelebil 1989; Halstead 1989) and deserves a careful examination. O'Shea suggested distinguishing between 'direct' and 'indirect' storage, the latter encompassing 'all those processes which transform foodstuffs into a more stable, alternative form, from which food value may later be recovered.' (1981: 169). Indirect storage, in turn, took two very different forms. The first one is exemplified by animal husbandry. If we put this aside, 'the transformations which are characteristic of indirect storage are *cultural*, and involve the equivalencing of foodstuffs and non-food items through exchange. (...) when such exchange is extended between corporate groups or villages, some manner of physical token usually enters the transaction. In such a transaction, food is exchanged for some non-food token with at least the implicit understanding that such tokens can later be re-exchanged for food. This type of exchange transaction is here referred to as *social storage*' (ibid.).

It is easy to understand why the emergence of social storage was a major turning point in social evolution: 'The use of tokens as a means of storing food value introduces a new dimension into primitive economic systems, the ability to accumulate wealth.' (1981: 177) – therefore, O'Shea added, to accumulate it in an unequal way. Among many others, Halstead (1989) in particular stressed the consequences of the hazards faced by households that created growing inequalities, opening opportunities for some successful ones to reduce impoverished ones through dependency.

This hypothesis has several indisputable merits, the main one being an attempt to account for the origins of wealth. Wealth, in its strict sense, does not exist in every society, and its birth is here correctly identified as a social process. Yet we think it contains several major defects.

First, the demarcation between 'direct' and 'indirect' food storage seems questionable. Concerning food storage strictly speaking, the only example of indirect storage which is given is animal husbandry, and one does not see why it should be distinguished from the smoking of fish, for instance. Almost no food can be stored without being 'processed in a more stable form' – which would mean that food storage is always 'indirect'. But the critical point is that 'social storage' is actually not storage at all, unless this word is used in a very vague (and deceiving) sense. This so-called 'storage' only 'stores' the possibility of others acquiring the stored food: it is nothing other than a monetary saving. It is indeed striking that O'Shea, whose theory deals with the emergence of money, describing two of its well-known functions (as a medium of exchange and store of value) and exposing the inflationist risk, never explicitly describes it as 'money', preferring for unknown reasons to speak of 'tokens'. However, primitive money which always takes the form of precious goods, is far less a 'token' than our own bank notes or electronic payments.

The essential point is that this theory revolves around the question of exchange: in order to obtain food from other communities in times of need, societies would have established the equivalence between non-food and food goods. This reasoning differs from the classical narrative which dates back at least to Adam Smith, whereby money was designed as a mean of facilitating a pre-existing barter. Money as a means of exchange is nevertheless at the core of both theories, an idea which should be challenged for several reasons.

To begin with, it is a well-known fact that in all of the ethnographic cases where wealth is present, although it may be used to acquire foodstuffs, there is a general reluctance of proceeding with such exchanges. Trading precious items against food is widely considered as abnormal, to the extent that various anthropologists have claimed that 'prestige' items form a separate category with no interference with basic necessities. For instance, Gould (1966) showed this statement to be clearly excessive for the Tolowa Indians of California, but he also stressed how much it was unusual, and somewhat inglorious, to trade precious goods against food. On this matter, the Tolowa must be regarded as quite representative. Thus, it seems somewhat contradictory to acknowledge this, as Halstead (1989) willingly does, while maintaining that wealth was initiated in order to facilitate such exchanges.

The solution of this paradox is provided by a third line of explanation, following on from Testart (2001, 2005), who stressed the particular role of wealth in primitive societies:

What is the point of wealth in primitive societies? (...) The absence of any division of labour or, at least, its weak development, which allows everyone to produce his subsistence, induces that one does not need wealth for living. Because of the absence of fundiary² land ownership, wealth cannot be invested in productive goods and does not, by itself, generate profit. (...) Such an unnecessary and undesirable wealth (...) has none of the functions it achieves in our societies. In view of this fact (...) there are only two possible answers. The first is to say that wealth is useless. (...) It think that [this] is the typical answer of classical anthropology. (...) [which] pretends that it is purely conspicuous and does not serve any material purpose (...) The second answer, which is ours, is to say that this primitive wealth (...) is not a pure prestige concern because (...) it serves to payments of social obligations, imposed by law or custom, and quite mandatory and compelling. (Testart, 2005: 29–30)

The statement that 'one does not need wealth for living' should certainly be qualified, and we can grant that wealth was sometimes used for this purpose. But the fundamental proposition holds true: the main function of primitive money, and the most probable reason for its emergence, was not as a means of exchange, but rather of payment. Wealth, in those societies (as the Tolowa case, among hundreds of others, confirms beyond any doubt) is first and foremost the way of managing bride price, blood money, and possibly the various fines or fees required to join some secret society. Testart also noticed that in societies where those payments had been established, the public display of wealth was a common feature, be it through feasts, competitive exchanges, 'grade passages', etc. In a whole category of societies that he called 'conspicuous plutocracies', which included for instance the Northwest Coast so-called 'chiefdoms', formal political structures were actually lacking and wealth was the organizing principle of social dominance.

The relevant question, then, is not knowing how storage gave birth to wealth as a means of exchange, but how it led to the emergence of payments. That is, to understand the possible links between storage and bride price, blood money, etc. In another words, we must examine the relationship between the practice of storage and the introduction of material goods in compensations where, up to now, only human work, blood, or kinship ties were involved.

Towards a new solution

Testart confessed to be at loss with this problem (2005: 37–8). The only attempt he made was posthumous and unfinished (2014). Moreover, the question he tried to address was actually different: he was convinced that, at least for marriage, life-time obligations were characteristic of Australia. Everywhere else in the world, life-time obligations had preceded all the other forms, including the bride service – the well-known ‘sister exchange’ was curiously absent from his reasoning. To his eyes, these configurations of matrimonial compensation had a key impact on the technical progress, and the ‘backwardness’ of Australia, as well as the long-supposed stagnation of the European Upper Palaeolithic. It is not possible here to enter into details, but this reasoning turns out to be, at best, very questionable (Darmangeat & Pétilion 2015; Valentin & Pétilion 2018). The main point relevant to the present discussion is that the riddle of the extension of material goods (and, thus, wealth) into marriage and damage compensation, and its possible link to storage, remained unsolved.

Another common answer is offered by Hayden, who states that this evolution was manipulated, if not orchestrated, by a certain category of individuals he calls ‘aggrandizers’. These individuals exist (biologically) in every society, but it is only with the conditions of what he calls the ‘transegalitarian’ societies that they found themselves in a position to apply their talents to material production. This was executed through a number of ‘strategies’ (the term appears regularly in Hayden’s writings) among which we find the institution of bride price (2014: 165–6). However, it seems problematic to explain a social phenomenon, specifically the emergence of new social structures, through the strategies of a social group. This methodological individualism can hardly be something more than a dead end. No one could deny that in every society there are people with certain inclinations or talents to boast who acquire power and take the lead, eventually at the expense of others. But the reason why capitalism superseded feudalism is not because some individuals would have preferred to get rich through industry, trade or banking instead of mere military power. Generally speaking, individual strategies are explained by social structures, and not the opposite. Thus, seeing bride price as a result of a strategy pursued by aggrandizers, as a conscious will of part of the society, is at best partial, and at worst misleading. Long ago Engels pointed out that societies consist of intersecting contradictory wills and actions, and that the resulting situation is often something nobody had foreseen nor wanted. Furthermore Lemonnier, in a short but enlightening article (2008), highlighted

how bride price among people of New Guinea, probably – and ironically – resulted not from the desire to widen inequalities but rather, the desire to reduce them. Thus, a scientific and therefore materialistic social explanation cannot consider the will of social actors as ultimate causes; conversely, it has to explain these wills through social structures and their evolution.

In the quest for understanding the relationship between storage and the emergence of wealth, the empirical record provides some essential clues. We refer here to a database dealing with payments and slavery that we built by combining two existing datasets, to which we have added our own information concerning storage (Darmangeat 2018b). Despite the numerous difficulties and inevitable disputable choices,³ we think that some useful insights can be deduced from this material which includes 237 cases.

The first observation is that in the vast majority of societies storage and payments are altogether either absent or present. This supports the close link mentioned previously between both features, which may of course be read as an evolutionary proposition: the dichotomy roughly overlays the opposition between mobile hunter-gatherers on the one hand, and sedentary hunter-gatherers and cultivators on the other. Incidentally, our data also show that the slavery group, with very few marginal exceptions, is a subset of payment societies. This strongly supports the opinion that slavery is a by-product, and not a cause in itself, of wealth.

To return to our central question, it is also worth considering the few cases which seem to invalidate the correlation between storage and payments. These exceptions belong to two categories. The first one includes societies where storage is practiced but which, possibly or clearly, lack payments. Our sample includes six of such societies. Without going too far into detail, all of them are marked by wealth inequalities, although these are far more salient in certain cases (Conibo of Amazonia, Bemba of Africa, Tareumiut of Alaska) than in others (Toda of Gran Chaco, Zuni and Hopi pueblo Indians). The deficiencies of our information on several of these tribes makes it difficult to draw reliable conclusions. Nevertheless, it seems that with respect to payments, the Tareumiut case reveals an alternative, although obviously infrequent, path towards the emergence of wealth. Among these Inuit, rich people (called *umealit*) are the owners of the boats used to hunt big sea mammals, especially whales, or alternatively, individuals who control a trade route (Spencer 1959; Johnson & Earle 2000: 177). The reasons which could explain the near absence of payments among the Tareumiut are difficult to identify – more generally, the resistance to the development of payments seems to be

a feature of the whole Inuit cultural area. Conversely, one may put forward the hypothesis that in the specific conditions of coastal Alaska, the development of wealth inequalities may have involved specific mechanisms which, in a slightly anachronistic way, can be called 'capitalistic'. More probably, these tendencies were present elsewhere, but their importance remained secondary. The main means of production were the whale boats, produced at an expensive cost, which were individually financed but collectively used. This contrasts strongly with the general situation where the main means of production is land, available for anyone willing to clear it. The few individuals who possessed these boats held at least an economic power which was manifested in the right to levy part of the catches.

Correspondingly, our sample shows four (possibly five) societies in which payments were present but whose economies did not rely on any form of food storage. These societies challenge the role of storage in the same way that sedentary hunter-gatherers challenged the role traditionally assigned to agricultural societies. Incidentally, it is puzzling that Testart, who had identified these cases quite clearly, did not try to address the problem they posed to his theory. Some of them were hunter-gatherers living in environments rich enough to allow them to be sedentary without practicing any form of storage. One example is the Calusa, a Florida tribe known only by early Spaniard witnesses (Fontaneda 1944 [1575]) and archaeology (Gogin & Sturtevant 1964; Hutchinson et al. 2016; Thompson et al. 2018); another is the Asmat, a tribe living on the south coast of New Guinea, whose main resources were wild sago starch and fishing (Sowada 1961; Eyde 1967; Trenkensuh 1970; Van Arsdale 1975). Another category is what Testart called 'mounted hunter-gatherers', that is, hunter-gatherers who used domesticated horses for hunting. Strictly speaking, this excludes the plains Indians, who were to a certain extent cultivators, even when they relied heavily on hunting on horseback (Zedeno et al. 2014). In the Gran Chaco, the Abipon tribe falls obviously into this category (Dobrizhoffer 1822 [1754]). All of these groups experience wealth inequalities although to varying degrees, ranging from only just discernible among the Asmat, to the high level among the Calusa whose society, with its slaves and its supreme leader, has often been qualified as a chiefdom. It is also worth mentioning some intermediate situations like the Jivaro of Amazonia. Traditionally, these and many other people in this area were manioc cultivators who ignored both storage and payments. Marriage in particular involved a bride service from the future husband, without any significant transfer of material goods. However, the situation changed with the arrival

of western rifles, which could be given instead of the traditional service, or to compensate a murder and put an end to a feud (Harner 1972).

The ethnographic information concerning the Calusa and the Abipon remains sparse, but what we know about the Asmat and the Jivaro enables us to suggest an answer to the question of why, in the absence of any food storage, a society may – or had to – engage in the transition to payments in particular, and to wealth in general. Our hypothesis is that the trigger is *the existence, on a sufficiently large scale, of moveable, durable goods requiring an important amount of (individual) work for their making* (Darmangeat 2017). These goods, once they exist on a sufficient scale, can be held for the equivalent of the prolonged time of service that is the most common form of matrimonial compensation among societies ignoring wealth, and thus it begins to replace it. Then, by a well-established equivalence, they also replace the human blood (or spouse) in murder compensations. We propose calling this category of goods 'W goods', W being the initial uniting work and wealth.

It has often been noticed that in lowland Amazonia, societies were 'primarily oriented toward the production of persons, not material goods' and that they were marked by 'the limited involvement of wealth and prestige goods in producing social relationships' (Fausto 1999: 934). Among the Jivaro, the rifle was then an imported exception. If we turn to the Asmat, there are several possible W goods, but the most evident one is the canoe. We do not know the exact amount of work needed to manufacture them, but a witness wrote that a large canoe represented about two months of individual effort (Eyde 1967: 45), in a time where metal axes had already replaced traditional stone ones. It is very probable that this figure should be greatly revised upwards when talking about pre-contact times. In any case, the making of a canoe, which constituted the most important manufactured property of the Asmat (Van Arsdale 1975: 36), was 'one of the principal duties a man has to his wife's brothers or father, and a man should give a canoe to his fiancé's brothers or father before marriage' (Eyde 1967: 43). This obligation seems to have existed even in the specific situations of marriage that did not imply the payment of a formal (and additional) bride price.

The 'W goods' hypothesis not only explains why some societies lacking food storage achieved the transition to payments and wealth, but it also gives a decisive clue to the reasons for which it was the general case in societies whose economies relied on food storage. As a matter of fact, food stores are by definition W goods; thus we can assess that where there is food storage, there have to be payments – with the few possible or

clear exceptions already mentioned. Admittedly, food articles seldom constitute a noticeable part of the bride price or of blood money, and this could be held as an objection against the W goods hypothesis. Yet, the paradox is only apparent. Preserved food is always a relatively low-value item, compared to rare shells, manufactured skins, canoes, etc. The only form under which food embodies a high value is that of a living domestic animal, typically the pig in New Guinea (Lemonnier 1993). In other words, if the goods used for payments are regarded as primitive money – and they should be – preserved food is usually only small change. Societies engaged in food storage tend to be sedentary and to produce also significant volumes of other goods embodying a higher amount of work which are thus much more convenient to be used as money. Therefore it is not surprising that in such economies, food stocks are almost never money goods, even though they are W goods. This is another way of saying that the ‘prestige goods’ often referred to in the ethnographic literature are a subset of W goods – those that were selected to be used in payment transactions.

Conclusion

In light of the discussion above, two main conclusions can be drawn. The first pertains to the archaeological interpretation of storage. If the presence of large and possibly public storage devices may indicate the existence of some kind of ‘chiefdom-like’ political structures, it follows that the observation of small-scale societies shows that any significant storage is a fairly good proxy of the presence of wealth, and thus of wealth inequalities. The correlation, as we saw, is not perfect. In fact, wealth may exist without any storage. Conversely, the possibility of storage without payments and, even less likely, without any kind of wealth should not be totally ruled out. However, this last configuration seems to be a very rare occurrence. Therefore, when the archaeological record seems to indicate such a case (Prentiss et al. 2014), the first hypothesis that should be considered is the archaeological visibility of wealth. In its early stages, wealth often does not appear in ostentatious forms (for instance, bigger houses), and sometimes not even as shells, beads or precious blades. Rather, the ‘prestige goods’ may be mainly represented by domestic animals given in payments and killed on some special occasions. If these occasions are memorialized through the preservation and display of animal parts, as it is likely the case in Çatal Höyük (see Testart 2006 for an ethnographically informed interpretation of the bovid crania which contradicts the egalitarian reading of Bogaard et al. 2009), the archaeologist is given reasonable evidence

of wealth. If not, he might wrongly reach the conclusion of complete economic equality.

At another level, the W goods hypothesis provides a materialistic explanation of the transition to payments, and therefore in the vast majority of cases, to wealth differentiation. It is because societies began to invest higher quantities of work in durable goods that they began to regard these goods as equivalent to the work they embodied – as Gilman already observed, ‘Wealth, after all, is a concentration of human labour into durable asset’ (1990: 349). In a Marxist vocabulary, it may be said that the transition to payments, with the replacement of the bride service (or any custom related to it) by the bride price, represents the first victory of dead labour over living labour in the history of social relations. To conclude this point, we do not underestimate the difficulties that arise out of this general social law. Not only do few societies seem to have taken an alternative path to wealth than payments, but also it is possible that the same approximate level of W goods did not always lead to the same developments. As noted above, in the Inuit world where W goods are undeniably present (in the form of dogs, sledges or clothing), payments seem to have remained, at best, limited. The reasons that may explain this relative resistance, here and possibly in other cultural areas, require further research.

Notes

1. Not to be confused with what we called ‘social surplus’.
2. Testart calls ‘funduary’ a land ownership that is not founded on work. Land rent is associated with this form of ownership which, according to him, constitutes a criterion of a class-based society.
3. For a general presentation of our method and a case-by-case short discussion of our definitions, see <http://cdarmangeat.free.fr/tryptique/donnees.html> (in French).

References

- Arnold, J., 1993. Labor and the Rise of Complex Hunter-Gatherers. *Journal of Anthropological Archaeology* 12, 75–119.
- Ashraf, Q., & O. Galor, 2011. Dynamics and Stagnation in the Malthusian Epoch. *American Economic Review* 101(5), 2003–41.
- Belovsky, G.E., 1988. An Optimal Foraging-Based Model of Hunter-Gatherer Population Dynamics. *Journal of Anthropological Archaeology* 7, 329–72.
- Bender, B., 1978. Gatherer-Hunter to Farmer: A Social Perspective. *World Archaeology* 10(2), 204–22.
- Bender, B., 1981. Gatherer-Hunter Intensification, in *Economic Archaeology*, eds. A. Sheridan & G.N. Bailey. Oxford: British Archaeological Reports (International Series 96).

- Bentley, G.R., G. Jasienska & T. Goldberg, 1993. Is the Fertility of Agriculturalists Higher Than That of Non-agriculturalists? *Current Anthropology* 34(5), 778–85.
- Bocquet-Appel, J.-P., 2009. The Demographic Impact of the Agricultural System in Human History. *Current Anthropology* 50(5), 657–60.
- Bocquet-Appel, J.-P., 2011. The Agricultural Demographic Transition During and After the Agriculture Inventions. *Current Anthropology* 52 – 54 (The Origins of Agriculture: New Data, New Ideas), S497–S510.
- Bogaard, A., 2017. The archaeology of food surplus. *World Archaeology* 49(1), 1–7.
- Bogaard, A., M. Charles, K.C. Twiss, A. Fairbairn, N. Yalman, D. Filipović, G.A. Demiregi, F. Ertuğ, N. Russell & J. Henecke, 2009. Private pantries and celebrated surplus: storing and sharing food at Neolithic Çatalhöyük, Central Anatolia. *Antiquity* 83, 649–68.
- Boone, J.L., 2002. Subsistence Strategies and Early Human Population History: An Evolutionary Ecological Perspective. *World Archaeology* 34(1), 6–25.
- Boserup, E., 1965. *The conditions of agricultural growth: the economics of agrarian change under population pressure*. Chicago: Aldine.
- Bowles, S., 2011. Cultivation of Cereals by the First Farmers Was not More Productive than Foraging. *Proceedings of the National Academy of Science* 108(12), 4760–5.
- Childe, V.G., 1954 [1942]. *What Happened in History*. London: Penguin.
- Clark, G., 2007. *A Farewell to Alms. A Brief Economic History of the World*. Princeton: Princeton University Press.
- Dalton, G., 1960. A Note of Clarification on Economic Surplus. *American Anthropologist* 62(3), 483–90.
- Dalton, G., 1963. Economic Surplus, Once Again. *American Anthropologist* 65(2), 389–94.
- Darmangeat, C., 2015a. Certains étaient-ils plus égaux que d'autres? Domination dans les sociétés sans richesse. *Actuel Marx* 57, 156–72.
- Darmangeat, C., 2015b. Certains étaient-ils plus égaux que d'autres? Exploitation dans les sociétés sans richesse. *Actuel Marx* 58, 144–58.
- Darmangeat, C., 2017. La pirogue et le grenier: les déterminants techno-économiques du passage aux paiements. *Artefact* 6, 133–51.
- Darmangeat, C., 2018a. Le surplus et les inégalités sociales: une causalité au-dessus de tout soupçon? *Bulletin de la Société préhistorique française* 115(1), 53–70.
- Darmangeat, C., 2018b. Paiements, esclavage et exploitation: éléments d'un triptyque. *Cahiers d'Économie politique* 75.
- Darmangeat, C., & J.-M. Pétilion, 2015. Structures sociales et blocages techniques dans l'Australie aborigène: quelques éléments critiques. *Techniques et cultures* 64(2).
- Dobrizhoffer, M., 1822 [1754]. *An Account of the Abipones. An equestrian people of Paraguay*. 3 vols. London: John Murray.
- Drucker, P., 1939. Rank, Wealth, and Kinship in Northwest Coast Society. *American Anthropologist* 41(1), 55–65.
- Engels, F., 1954 [1878]. *Anti-Dühring: Herr Eugen Dühring's revolution in science*. Moscow: Foreign Languages Pub. House.
- Engels, F., 1972 [1884]. *The Origin of Family, Private Property and the State*. London: Lawrence and Wishart.
- Eyde, D.B., 1967. *Cultural correlates of warfare among the Asmat of South-West New Guinea*. PhD, Yale University.
- Fausto, C., 1999. Of Enemies and Pets: Warfare and Shamanism in Amazonia. *American Ethnologist* 26(4), 933–56.
- Feinman, G., & J. Neitzel, 1984. Too Many Types: An Overview of Sedentary Prestate Societies in the Americas. *Advances in Archaeological Method and Theory* 7, 39–102.
- Fontaneda, H., 1944 [1575]. *Memoir of Hernando de Escalante Fontaneda respecting Florida*. Miami: University of Miami and the Historical Association of Southern Florida miscellaneous publications 1.
- Galor, O., & D.N. Weil, 2000. Population, Technology, and Growth: From Malthusian Stagnation to the Demographic Transition and Beyond. *American Economic Review* 90(4), 806–28.
- Gilman, A., 1990. Comment. *Current Anthropology* 31, 349.
- Goggin, J., & W. Sturtevant, 1964. The Calusa: a stratified non-agricultural society (with Notes on sibling marriage), in *Explorations in cultural anthropology: essays in honor of George Peter Murdoch*, ed. W.H. Goodenough. New York: McGraw-Hill, 188–94.
- Gould, R.A., 1966. The Wealth Quest among the Tolowa Indians of Northwestern California. *Proceedings of the American Philosophical Society* 110(1), 67–89.
- Halstead, P., 1989. The economy has a normal surplus: economic stability and social change among early farming communities of Thessaly, Greece, in *Bad Year Economic. Cultural Responses to Risk and Uncertainty*, ed. P. Halstead. New York: Cambridge University Press, 68–80.
- Harner, M., 1972. *The Jivaro: People of the Sacred Waterfalls*. New York: Anchor Press.
- Harris, M., 1959. The Economy Has no Surplus? *American Anthropologist* 61(2), 185–99.
- Harris, M., 1961. A Reply to Rotstein's Note. *American Anthropologist* 63(3), 563.
- Hastorf, C.A., & L. Foxhall, 2017. The social and political aspects of food surplus. *World Archaeology* 49(1), 26–39.
- Hayden, B., 2014. *The Power of Feasts: From Prehistory to the Present*. Cambridge: Cambridge University Press.
- Hutchinson, D., L. Norr, T. Schober, W.H. Marquardt, K.J. Walker, L.A. Newsom & M. Scarry, 2016. The Calusa and prehistoric subsistence in central and south Gulf Coast Florida. *Journal of Anthropological Archaeology* 41, 55–73.
- Ingold, T., 1983. The Significance of Storage in Hunting Societies. *Man* 18(3), 553–71.
- Johnson, A.W., & T. Earle, 2000. *The Evolution of Human Societies. From Foraging Group to Agrarian State*. Stanford: Stanford University Press.
- Kaiser, T., & B. Voytek, 1983. Sedentism and economic change in the Balkan Neolithic. *Journal of Anthropological Research* 2, 323–53.
- Keeley, L.H., 1988. Hunter-Gatherer Economic Complexity and 'Population Pressure': A Cross-Cultural Analysis. *Journal of Anthropological Archaeology* 7, 373–411.
- Kirch, P.V., 1984. *The Evolution of the Polynesian Chiefdoms*. Cambridge: Cambridge University Press.

- Kirch, P.V., 1993. *The Wet and The Dry: Irrigation and Agricultural Intensification in Polynesia*. Chicago: University of Chicago Press.
- Kohler, T.A., et al., 2017. Greater post-Neolithic wealth disparities in Eurasia than in North America and Mesoamerica. *Nature* 551, 619–22.
- Kuijt, I., 2015. The Neolithic refrigerator on a Friday night: How many people are coming to dinner and just what should I do with the slimy veggies in the back of the fridge? *Environmental Archaeology* 20(4), 321–36.
- Larsen, C.S., 2003. Animal Source Foods and Human Health during Evolution. *Journal of Nutrition* 133(11), 3893S–3897S.
- Lemonnier, P., 1993. Le porc comme substitut de vie: formes de compensation et échanges en Nouvelle-Guinée. *Social anthropology* 1, 33–55.
- Lemonnier, P., 2008. En marge des femmes: la société contre le désir des hommes. *Archéopages* 1, 90–4.
- Marx, K., 1909 [1867]. *The Capital*. Book I. Chicago: Charles Kerr & Co.
- Mayshar, J., O. Moav, Z. Neeman & L. Pascali, 2015. Cereals, Appropriability and Hierarchy. *Barcelona GSE Working Paper Series* 842.
- Mazoyer, M., & L. Roudart, 2006 [1997]. *A history of world agriculture: from the neolithic age to the current crisis*. New York: Monthly Review Press.
- Morehart, C.T., & K. De Lucia (eds.), 2015. *Surplus: The Politics of Production and the Strategies of Everyday Life*. Boulder: University Press of Colorado.
- Morgan, L.H., 1922 [1851]. *League of the Ho-dé-no-sau-nee or Iroquois*. New York: Dodd, Mead & Co.
- Morgan, C., 2015. Is it Intensification Yet? Current Archaeological Perspectives on the Evolution of Hunter-Gatherer Economies. *Journal of Archaeological Research* 23, 163–213.
- Morrison, K.D., 1994. The Intensification of Production: Archaeological Approaches. *Journal of Archaeological Method and Theory* 1(2), 111–59.
- Orans, M., 1966. The surplus. *Human Organization* 25(1), 24–32.
- O’Shea, J.M., 1981. Coping with scarcity: exchange and social storage, in *Economic Archaeology*, eds. A. Sheridan & G.N. Bailey. Oxford: British Archaeological Reports (International Series 96).
- O’Shea, J.M., & A.W. Barker, 1996. Measuring Social Complexity and Variation: A Categorical Imperative?, in *Emergent Complexity: The Evolution of Intermediate Societies*, ed. J.E. Arnold. Ann Arbor: International Monographs in Prehistory, 13–24.
- Pearson, H., 1957. The Economy Has no Surplus, in *Trade and Market in the Early Empires*, eds. K. Polanyi, C. Arensberg & H. Pearson. Glencoe (Ill.): The Free Press, 320–41.
- Pennington, R., 2001. Hunter-Gatherer Demography, in *Hunter-Gatherers. An Interdisciplinary Perspective*, eds. C. Panter-Brick, R.H. Layton & P. Rowley-Conwy. Cambridge: Cambridge University Press, 170–204.
- Prentiss, A.M., H.S. Cail & L.M. Smith, 2014. At the Malthusian ceiling: Subsistence and inequality at Bridge River, British Columbia. *Journal of Anthropological Archaeology* 33, 34–48.
- Rotstein, A., 1961. A Note on the Surplus Discussion. *American Anthropologist* 63(3), 561–3.
- Rousseau, J.-J., 2004 [1751]. *Discourse on the Origin of Inequality*. Mineola: New York: Dover Publications.
- Rowley-Conwy, P., & M. Zvelebil, 1989. Saving it for later, in *Bad Year Economic. Cultural Responses to Risk and Uncertainty*, ed. P. Halstead. New York: Cambridge University Press, 40–56.
- Sahlins, M., 1972. *Stone Age Economics*. New York: Aldine Atherton.
- Sharp, L., 1952. Steel Axes for Stone-Age Australians. *Human Organization* 11(2), 17–22.
- Sowada, A., *Socio-economic survey of the Asmat peoples of South-western New Guinea*. Washington: Catholic University of America.
- Spencer, R.F., 1959. *The North Alaskan Eskimo: A Study in Ecology and Society*. Smithsonian Institution, Bureau of American Ethnology, Bulletin 171. Washington: Government Printing.
- Steckel, R.H., J.C. Rose, C.S. Larsen & P.L. Walker, 2002. Skeletal Health in the Western Hemisphere From 4000 bc to the Present. *Evolutionary Anthropology* 11, 142–55.
- Svizzero, S., & C. Tisdell, 2015. The Malthusian Trap and Development in Pre-industrial Societies: A View Differing from the Standard One, in *Social Economics, Policy and Development*, St Lucia, The University of Queensland, School of Economics (Working Paper, 59). <http://purl.umn.edu/197551>
- Testart, A., 1979. Pourquoi les sociétés de chasseurs-cueilleurs sont-elles des sociétés sans classes? *Anthropologie et sociétés* 3(1), 181–9.
- Testart, A., 1982a. *Les chasseurs-cueilleurs ou l’origine des inégalités*. Nanterre: Société d’ethnographie.
- Testart, A., 1982b. The significance of food storage among hunter-gatherers: residence patterns, population densities, and social inequalities. *Current Anthropology* 23, 523–37 (with comments).
- Testart, A., 1985. *Le communisme primitif (I): économie et idéologie*. Paris: Maison des sciences de l’homme.
- Testart, A., Moyen d’échange/moyen de paiement: Des monnaies en général et plus particulièrement des primitives, in *Aux origines de la monnaie*, ed. A. Testart. Paris: Errance, 11–60.
- Testart, A., 2005. *Éléments de classification des sociétés*. Paris: Errance.
- Testart, A., 2006. Interprétation symbolique et interprétation religieuse en archéologie. L’exemple du taureau à Catal Höyük. *Paléorient* 32(2), 23–57.
- Testart, A., 2014. L’évolution des chasseurs-cueilleurs: hypothèse supplétive sur le mariage. *Bulletin de la Société préhistorique française* 111(4), 593–602.
- Thompson, V.D., W.H. Marquardt, K.J. Walker, A.D. Roberts Thompson & L.A. Newsom, 2018. Collective action, state building, and the rise of the Calusa, southwest Florida, USA. *Journal of Anthropological Archaeology* 51, 28–44.
- Trenkenshuh, F., 1970. *An Asmat Sketch Book*, vol. 1. Hastings, Asmat Museum of Culture and Progress; Djajapura, Franciscan Press.
- Trigger, B., 2003. *Understanding Early Civilizations*. Cambridge: Cambridge University Press.
- Turgot, A.R., 1766. *Réflexions sur la formation et la distribution des richesses*, [s. 1.], [s. n.].

- Valentin, B., & J.-M. Pétilion, 2018. Autour de Lascaux: dialogue avec Alain Testart, in *De l'ethnologie à la préhistoire. En hommage à Alain Testart*, eds. D. Karadimas, V. Lécivain & S. Rostain. Paris: L'Herne (*Cahiers d'anthropologie sociale*, vol. 16), 107–20.
- Van Arsdale, P., 1975. *An Asmat Sketch Book n°5: Perspective on Development in Asmat*. Agats, The Asmat Museum of Culture and Progress.
- Wesson, C.B., 1999. Chiefly Power and Food Storage in South-eastern North America. *World Archaeology* 31(1), 145–64.
- Winterhadler, B., W. Baillargeon, F. Capelletto, I.R. Daniel & C. Prescott, 1988. The Population Ecology of Hunter-Gatherers and Their Prey. *Journal of Anthropological Archaeology* 7, 289–328.
- Winterhalder, B., C. Puleston & C. Ross, 2012. Household-level Storage and Population-Level Consequences in a Temperate Zone, Agrarian Production System. Amerind Seminar Paper.
- Winterhalder, B., C. Puleston & C. Ross, 2015. Production risk, inter-annual food storage by households and population-level consequences in seasonal prehistoric agrarian societies. *Environmental Archaeology* 20(4), 337–48.
- Wood, J.W., 1998. A Theory of Preindustrial Population Dynamics Demography, Economy, and Well-Being in Malthusian Systems. *Current Anthropology* 39(1), 99–135.
- Wu, L., 2015. If not Malthusian, Then Why? *Berkeley Economic History Laboratory Working Papers*, WP2015-01. <http://behl.berkeley.edu/wp/2015-01>
- Zedeño, M.N., M. Nieves, J.A.M. Ballenger & J.R. Murray, 2014. Landscape Engineering and Organizational Complexity among Late Prehistoric Bison Hunters of the Northwestern Plains. *Current Anthropology* 55(1), 23–58.