PROVISIONING URBAN COMMUNITIES : A TOPIC IN SEARCH OF A MODEL

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Summary

It is argued in this paper that the movement of animal resources between urban communities and their rural hinterland would have been far more complicated than is generally allowed in interpretations of bone assemblages from urban sites. A market exchange model is generally assumed, though seldom explicitly justified, and interpretation depends too heavily on contemporary notions of what constitutes "rational" animal husbandry, rather than considering the evidence provided by economic anthropology concerning the functioning of stratified nucleated communities and their use of animal resources as cultural attributes. A simplistic formalist model of costs and products in a market-based system is used to show the influence of social factors on decision-making, and the inherent weakness of any such model. The possibility of animal resources being mobilised through redistribution is discussed, and the paper concludes with a plea for more systematic model-building, and less ideographic interpretation of empirical data.

Key Words

Animal Resources, Urban Market, Models

Résumé

L'approvisionnement des communautés urbaines : un sujet en quête d'un modèle.

Cet article montre que le mouvement des ressources animales entre les communautés urbaines et leur campagne a été beaucoup plus complexe que ce qui est généralement admis lors de l'interprétation des assemblages fauniques des sites urbains. On admet souvent, sans justification explicite, le modèle d'un marché d'échanges, et l'interprétation dépend trop fortement des notions contemporaines sur l'élevage animal "rationel" plutôt que des observations de l'anthropologie économique sur le fonctionnement des communautés nucléaires stratifiées et sur leur utilisation des ressources animales comme attributs culturels. Un modèle simpliste du coût et de la production dans un système fondé sur le marché est utilisé pour montrer l'influence des facteurs sociaux sur la prise de décision, et la fragilité systématique de tous les modèles de ce genre. L'auteur discute la possibilité que les ressources animales soient mobilisées à travers un système de redistribution, et il conclut par un plaidoyer pour une modélisation plus systématique et contre l'interprétation idéographique de données empiriques.

Mots clés

Ressources animales, Marché urbain, Modèles

Introduction

Of all the poorly-defined terms used in archaeology, "town" is perhaps one of the most difficult. Definitions of the term used in economics or geography require consideration of attributes which may be at best ambiguously represented in the recoverable archaeological record, and we are reduced to seeking a definition which will suffice within archaeology. Towns are, of course, a polythetic group, membership of the group being defined by possession of some, though not all, of a long list of attributes. When considering the exploitation and distribution of resources derived from animals, towns can usefully be seen in simple terms as nucleations of human population in which agricultural production is minimal, and which occupy nodes on the network of resource distribution. Towns are net consumers of animal resources ; only net consumers, because some stock-keeping certainly would have gone on, for example, in medieval tenements or within the precincts of urban monastic houses. In order to obtain supplies of animal resources, therefore, towns have to develop a distributive relationship with their non-urban hinterland. This hinterland is seen as being occupied by net producers of animal products ; again, net producers, because the agrarian population itself consumes some of the food, hides, wool and the other resources which livestock can provide.

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Towns have sometimes been represented as a convenient mechanism for the dispersal of productive surplus (CARVER, 1987). Whether we accept this simple analysis or not, it is clear that urban communities have had to develop means of controlling and articulating the movement of animal, and other, resources. Today, that mechanism is one of exchange through a coinage-mediated market, and it is clear that this mechanism has been in place throughout northern Europe at least since the end of the 10th century AD (HODGES, 1989). Within a complex, stratified population, there is also the possibility of redistributive mechanisms, whereby resources accrued by an elite through tithes, renders and extortion are passed, as it were, down the wealth gradient, in return for labour and allegiance. Some medieval towns included castles and palaces within their extent, and many Roman towns had their origins in forts or other military establishments. An element of redistribution of resources in what might otherwise be defined spatially as an urban context must therefore be seen as a possibility, with what has been termed "mobilised exchange" occurring in Roman towns in militarily active areas (GREENE, 1986 : 46).

Nucleation of population tends to bring with it a nucleation of archaeological deposits and materials, and thus the "net consumer" end of the activity of provisioning is heavily over-represented in the excavated record. Bone debris is often particularly abundant in urban archaeological deposits, and the recording and publication of large bone assemblages from northern European towns has occupied many man-years of work. As is often the case in archaeology, an excess of data brings with it a dearth of theory-building : how can there be time to speculate on the functioning of early medieval markets when there is another million bone fragments to record ? The answer, of course, is that without the theory, the recording is just so much data-acquisition, falling far short of the provision of useful archaeological information. The central thesis of this paper is that the study of urban bone assemblages needs to move into the area of synthesis and modelling, partly in order to make best use of the immense dataset which has already accumulated, and partly in order to ensure that further data collection is better targeted.

To adopt the terminology of archaeological theory, interpretation of bone data is usually processual, assuming cross-cultural norms predicated by physiological logistics of the domestic livestock, and assumptions about resource optimisation. The major productive strategies which are considered - targeted on meat, milk, wool - are adaptive strategies. Taking the argument from a different point, what we perceive as culture is the sum of the situational expediency of many active individuals. This social background will be reflected in the procurement, control, and disposal of food, and thus of domestic livestock. A contextual approach to the study of bone debris on occupation sites is therefore essential, and the implication of this is a separate assessment of context for every site assemblage. Urban bone assemblages have the advantage that they are often associated with substantial recovered material culture and written history. This gives a contextual interpretation more hope of success for, for example, Roman Lincoln or medieval Paris than for Windmill Hill or Heuneberg.

Many urban bone assemblages are analysed and discussed against an, often unstated, assumption that animal resources came into the town by means of a fully-commercialised market, in return for currency (i.e. coinage or goods). This approach is seldom explicitly justified, though an honourable exception is Maltby's (1984) examination of animal resource exploitation in a Roman context, an argument which has subsequently been applied to Roman assemblages from York (O'CONNOR, 1988). Perhaps because the social context of urban assemblages is likely to have been highly complex, there is a tendency to ignore it, and to concentrate instead on simple diachronic changes in exploitation (O'CONNOR, 1982), or on unusual deposits of apparently straightforward interpretation (O'CONNOR, 1984), or on the biology of the animals represented in the assemblages (REICHSTEIN and THIESSEN, 1974).

Slaughter strategies

Of key importance in understanding the relationship between livestock producers and consumers is the question of the age at which livestock were marketed and slaughtered in the town, as this may reflect the producers' disposal policy as much as the consumers' acquisition policy. Age at death data from cattle, sheep, pigs, and, more rarely, goats, are used to reconstruct the husbandry regime under which the animals were kept, often using interpretative criteria which were originally developed in the context of rural populations utilising reciprocity or redistribution rather than market exchange (CRIBB, 1985 ; PAYNE, 1973). In all cases, the age structure of the death assemblage is determined in part by the husbandry regime at the point of production and in part by the demands made by the consumers. In a relatively simple subsistence

system, a slaughter policy may be developed which accommodates both pressures ; after all, the producer and consumer groups are likely to be one and the same. Towns present circumstances in which the two groups are spatially and perhaps socially separated, and the relationship between them may be more purely commercial. The element of consumer demand may, therefore, pay little heed to the practical needs of production, and the use of coinage may further dislocate this relationship by creating a strongly demand-led market. It is at least theoretically possible, therefore, for circumstances to arise in which the death assemblages accumulating in a town reflect the urban demand, rather than an agronomically rational productive regime, or, conversely, for the assemblages to reflect a product-driven market in which consumer demand is either insufficient to exert an influence on the husbandry regime or is entirely consistent with that regime. We can see here a reflection of the arguments which surround the concept of environmental determinism. The environment of a human population constrains, rather than determines, those peoples' cultural compromises. Agrarian production and resource distribution are one facet of material culture, and must be seen as being open to social manipulation and choice within the constraints imposed by an environment which may itself be heavily modified by cultural activity. The relationship between agrarian production and urban culture is thus an accommodative, pragmatic one, and not crudely deterministic.

Something of the potential effect of consumer demand can be seen if we consider a highly simplistic formalist model of the costs and products of livestock production in a market exchange context. The model is concerned with costs, products and perceived value in abstract, not with particular species or the commodities which they produce. Furthermore, the model suffers from the solipsism of having been constructed from the viewpoint of the archaeologist, not of the stockman.

The costs of livestock production can be seen as being divided into two categories. Non-recurrent cost represents the cost of obtaining the stock in the first place, whether by breeding or by purchase or other acquisition. Recurrent cost is the cost of keeping the stock alive and healthy, and thus accrues throughout the animals' life. The product of a herd or flock can similarly be divided. Non-recurrent product is that which can only be cropped by killing the animal, such as meat, tallow or bones. Recurrent product encompasses those commodities which can be cropped repeatedly, if sometimes intermittently, and includes wool, traction power, milk, offspring and dung. Successful livestock production might be seen as a simple matter of achieving an imbalance of product over cost, but two additional factors have to be borne in mind. The first is the insurance factor, whereby there may be a tendency for producers to retain additional stock as a hedge against some catastrophe, whether illness, bad weather, or aggressive neighbours. This factor may be relatively unimportant unless the "safety margin" is allowed to accumulate and unbalance the herd or flock demography, in which case the sudden culling of a cohort of the livestock might occur for no externally obvious economic reason.

The second factor is the social factor, which takes cognisance of the fact that human communities commonly invest social merit in the mere possession of livestock, irrespective of their "cash-in" value, or give symbolic value to animals of a particular colour or pattern. The popularity of Jacob sheep, for example, has little or no basis in terms of the productivity of that breed, yet to have a flock of Jacobs on one's paddock has a cachet which the far more useful Mule or Suffolk Cross sadly lacks. Working on the biological fringes of archaeology, it is easy to forget that domestic livestock are, and were, a cultural attribute, and that the possession and control of livestock served a social function far beyond the simple provision of meat or wool.

Using the terminology outlined above, the life of an animal can be seen as passing through an investment phase, in which non-recurrent and recurrent costs have yet to be offset by any product, and into a production phase, in which recurrent product begins to pay off the accumulated "debt". If costs are high, then either the value of the products will have to be high, or there will be pressure to dispose of the livestock at an early stage, so as to minimise recurrent cost. The slaughter of livestock during the investment phase of their life could thus be either opportunistic exploitation of a high value non-recurrent product, or an attempt to head off a rapidly-accumulating recurrent cost.

An example of such a strategy may be seen in bone assemblages from second/third century AD deposits in York. Although the majority of the sheep represented in such assemblages are adults, two sites have now produced substantial minority components of young lambs. These lambs have been grouped on the basis of dental eruption as about two to four months old, though the width of that age bracket reflects the uncertainty of the age attribution, rather than an estimate of the actual span of ages represented. At four months old, these lambs would not have been producing useful amounts of wool, and of course neither

milk nor offspring, and thus they were slaughtered within the investment phase of life. According to the purely functionalist model offered here, this slaughter policy implies either that the lambs were deemed to be too expensive to keep, with insufficient product to anticipate, or that they had a high non-recurrent value. The present author has argued elsewhere that the former interpretation should be accepted ; that the lambs were surplus male lambs culled from dairy flocks (O'CONNOR, 1988 : 88). Why, then, were the lambs not killed when a few weeks, rather than months, old, and why were their remains deposited within the Roman town, and not at the point of production ? Their deposition within the town implies that their value at market was sufficient to justify the cost of transporting them. A case can equally well be made for arguing that these lambs may have had a sufficiently valuable non-recurrent product to justify their slaughter after appreciable cost had accrued, but before any recurrent product had been cropped. At two to four months old, even a modern sheep would give a poor meat carcass. That is to judge carcass quality in bulk terms, however, and it is quite possible that a specialist market existed for newly-weaned lamb. By the late second century, Roman York was a large and complex town, probably still centred on its garrison, but with a substantial civilian population, and other trappings of social stratification and group identification. In such a context, the use of an economically irrational foodstuff as a social marker can be seen as quite likely to have developed ; the Roman equivalent of caviar or globe artichokes. Young lamb may therefore have been in demand precisely because it fetched a high price. Nor should it be forgotten that pre-Constantine Roman Britain was a place of regular propitiatory sacrifices, a phenomenon which may also have placed a high value on certain classes of livestock.

A phenomenon familiar from sheep death assemblages from a number of English towns is the presence of numbers of second-year individuals, the majority of the assemblage usually being appreciably older. GRANT (1988) has drawn attention to this phenomenon, and has suggested that it indicates a sufficiently high demand for meat to justify killing some sheep just as they were beginning to be productive of wool. Faced with much the same age distribution in sheep from medieval Perth, Hodgson (unpublished MS) arrived at a different conclusion, one based on his close knowledge of sheep farming, and usefully illustrating the insurance factor. The second-year individuals, it is argued, are intact males which were surplus to breeding requirements. One option would have been to cull them as young lambs, thus minimising recurrent cost, and retaining only the chosen few rams through the winter of their first year. In the event of that winter being more than usually inclement, however, there would be a risk of losing a year's rams. By keeping an excess of intact male lambs into their second year, the effect of first winter losses can be reduced, the breeding stock can be chosen having observed the flock for many months instead of only a few weeks, and the surplus males will give a useful first clip of wool before going to market. In return for the increased recurrent cost, therefore, some recurrent product can be cropped, as well as implementing a risk-management strategy. In the case of Hodgson's interpretation, then, the Scottish climate is an essential context against which to read the data.

Circumstances where non-recurrent cost is high might be accommodated either by retaining stock to a considerable age, so as to maximise cropping of recurrent product, or by exploiting circumstances which raise the value of non-recurrent product. The latter strategy is seen in post-medieval Britain, at a time when some urban populations were increasing rapidly, and the demand thus generated was severely distorting agrarian economics. ARMITAGE (1978) has chronicled the rise of droving and of the role of graziers in the counties immediately around London.

Young cattle were purchased from producers in the northern and western parts of Britain, and were driven to the south-eastern counties to be fattened rapidly for the burgeoning London market. For the graziers on whose land the cattle were fattened, the calves must have represented a considerable investment in terms of original purchase and cost of droving. This investment could be justified by the valuable non-recurrent product to be obtained when the cattle were sold for slaughter. There was thus pressure to minimise recurrent cost by slaughtering as early as possible, and therefore to fatten the cattle as rapidly as grazing and contemporaneous levels of breeding and selection would allow. This pattern of husbandry is familiar enough today, but we must recognise that a high demand, and therefore a high price, for meat or some other carcass product is essential if such a strategy is to be economically viable. It is worth noting that legislation was necessary in 1532 to inhibit the sale of cattle under two years of age precisely in order to conserve stocks : presumably consumer demand was threatening to overwhelm rational agronomic practise (GRANT, 1988 : 153). Elsewhere, HODGSON (unpublished MS) has detailed some of the pressures facing livestock producers in eastern Scotland in the

fifteenth and sixteenth centuries in the face of high consumer demand for hides and skins for the export trade, pressures which produced a range of legislative responses including tight control of the movement and sale of cattle. The Scottish example is a useful reminder that the value of non-recurrent product need not always have been measured in terms of the price of meat.

Before and beyond the urban market

Any nucleation of population, with concomitant nucleation of commerce or production, could generate a sufficient demand for some animal resources to distort the system of production in the hinterland. Towns are an obvious case, though military establishments of various kinds may have created a sudden local demand for meat or skins, a demand which may not necessarily have been mediated through the gentle, pragmatic pressures of the market-place. In the prehistoric period, when we are not inclined to think in terms of urban communities, major civil engineering projects may have created local demands on an urban scale. The construction of one of the Somerset Levels trackways, for example, or of the first phase of settlement at Biskupin (COLES and COLES, 1989 : 138-40), must have involved the mobilisation of large numbers of people, who presumably needed to be fed.

This raises the question of redistribution as a means of mobilising resources, much of the discussion so far having been in the context of market exchange. At some point during the 7th to 10th centuries AD, the developing towns of north-western Europe developed market exchange as an economic basis, presumably in succession to a redistributive system. Whether towns preceded markets, or vice versa, is a chicken-and-egg argument of little purpose, which hinges on definition of terms. For the present purpose, we need to note the possibility that nucleations of population may be encountered in the archaeological record, and their animal-derived debris recovered and recorded, in which the movement of resources had little to do with the supply and demand of a market exchange system. HODGES (1989) has argued that the wics or emporia which developed around north-western Europe during the early stages of post-Roman urbanisation were maintained by social elites as a means of procuring, and controlling the trade of, prestige goods. On this model, such settlements may have been provisioned, rather than trading directly for food and other organic resources, and it has been argued elsewhere that provisioning through redistribution accounts for the low diversity of vertebrates represented in mid-Saxon deposits at Hamwic, Southampton, and at Fishergate, York (O'CONNOR, 1991, forthcoming). The York assemblages also show, in common with contemporaneous material from Ipswich (JONES and SERJEANTSON, 1983), a precise age-selection of sheep and pigs. The observed selection of sheep, in particular, does not readily fit a simple supply and demand model, and may more readily be explained in the context of redistribution. Redistribution poses quite a challenge to a processual interpretation of animal bone data. A filter has been applied to the flow of resources between producer and consumer, in the form of an elite person or group, using an institutional mechanism to control the movement of those resources. Such circumstances may well be encountered in the early periods of urban growth, and perhaps also in the context of an occupying army. Indeed, REECE (1979), apparently writing whilst under the influence of Hodder, has argued that for the first two centuries AD, Britain remained locked into a tribal economy based on reciprocity and redistribution, rather than cash-based marketing. Conversely, MALTBY (1984) and O'CONNOR (1988 : 118-9) have argued on the basis of bone debris from Roman urban sites that market exchange was at least locally in place by the end of the second century, though this debate clearly has some way to run.

Conclusions

If this paper has ranged rather too widely, it is precisely because the subject of urban provisioning is extremely complex, and because it requires discussion of areas of human social and economic behaviour far removed from simple questions of animal husbandry. None the less, numerous bone assemblages from urban sites have been analysed and published, not least by the present author, with little consideration of the social mechanisms which underlay the movement of those resources. We have a lot of data on which to work. Interpretation of those data has often been ideographic ; seeing patterns and offering an interpretation, perhaps then testing the interpretation by statistical analysis of the dataset from which it was originally developed. Perhaps a change to a nomothetic approach is overdue. In common with other research areas within archaeology, we need to develop sound theoretical models, in this case of the social factors acting in urban provisioning and of livestock husbandry in the face of consumer demand, models which take account of the economic anthropology of human societies as much as of the biology of domestic livestock. Having developed such models, they can then be tested,

modified and refined, and further work on urban bone assemblages can be given more of a sense of direction, a specific set of hypotheses to test. We bring our individual preconceptions to the recording and interpretation of a bone assemblage, and those preconceptions are often implicit and poorly articulated. Replacing those preconceptions with explicit models would not bring absolute truth, which, as Thomas Huxley observed is "difficult, piecemeal, and probably unattainable". Instead it would force us to examine familiar data in different ways, perhaps thereby throwing some new light on this particularly difficult and fascinating topic.

Bibliography

ARMITAGE P. L. (1978) : Hertfordshire cattle and London meat markets in the 17th and 18th centuries, *London Archaeologist,* 3 : 217-33.

CARVER M. O. H. (1987) : *Underneath English towns : interpreting urban archaeology*, Batsford, London.

COLES B. AND COLES J. (1989) : *People of the wetlands*, Thames and Hudson, London.

CRIBB R. (1985) : The analysis of ancient herding systems ; an application of computer simulation in faunal studies, *in* : G. BARKER and C. GAMBLE eds, *Beyond domestication in prehistoric Europe,* Academic Press, London : 75-106.

GRANT A. (1988) : Animal resources, *in* : G. ASTILL and A. GRANT eds, *The countryside of medieval England,* Blackwell, Oxford : 149-87.

GREENE K. (1986) : *The archaeology of the Roman economy,* Batsford, London.

HODGES R. (1989) : *Dark Age economics* (2nd ed.), Duckworth, London.

HODGSON G. H. I. (unpublished MS) : *Report on the animal remains excavated during 1975-76 from the medieval levels at the High Street site, Perth.*

JONES R. T. and SERJEANTSON D. (1983) : Animal bones from five sites at Ipswich, *Ancient Monuments Laboratory Reports* 13/83

MALTBY J. M. (1984) : Animals and animal bones in the Romano-British economy, *in* : C. GRIGSON and J. CLUTTON-BROCK eds, *Animals and Archaeology : 4. Husbandry in Europe,* BAR Int. Ser, 227 : 125-38.

O'CONNOR T. P. (1982) : Animal bones from Flaxengate c.870-1500, *Archaeology of Lincoln 18/1,* Council for British Archaeology, London.

O'CONNOR T. P. (1984) : Selected groups of bones from Skeldergate and Walmgate, *Archaeology of York 15/1,* Council for British Archaeology, London.

O'CONNOR T. P. (1988) : Bones from the General Accident site, Tanner Row, *Archaeology of York 15/2,* Council for British Archaeology, London.

O'CONNOR T. P. (1991) : Bones from 46-54 Fishergate, *Archaeology of York* 15/4, Council for British Archaeology, London.

O'CONNOR T. P. (forthcoming) : Economy and environment in 8th to 11th century York, *in* : D. J. RACKHAM ed, *Economy and environment in Anglo-Saxon England.*

PAYNE S. (1973) : Kill-off patterns in sheep and goats : the mandibles from Asvan Kale, *Journal of Anatolian Studies,* 23 : 281-303.

REECE R. (1979) : Roman monetary impact, *in* : B. C. BURNHAM and H. B. JOHNSON eds, *Invasion and response : the case of Roman Britain,* BAR Brit Ser, 73 : 211-7.

REICHSTEIN H. AND THIESSEN M. (1974) : *Berichte über die Ausgrabungen in Haithabu, Bericht 7,* Karl Wachholz, Neumunster.