"Archaeological Analogues from NW Spain"
Reynolds P J, in "Les techniques de conservation des grains a long terme" Vol 2 1981 CNRS Paris

The prehistorian studying the agriculture and its allied structures and processes of the four and a half millennia B.C. is beset by almost insurmountable difficulties. My own research, which ranges from the Neolithic to the Romano-British period is designed to test the theories or hypotheses offered to explain the development of agriculture. A description of the Butser Ancient Farm Research Project, its principles, philosophy and aims is reported as an appendix to the paper I presented to this conference in 1977.

For the prehistoric period our evidence is principally drawn from archaeological excavations of settlement sites. It comprises in a sense only two dimensional data. In the majority of cases all upstanding material have long since been destroyed. Post-holes and pits, gulleys, ditches and banks, sherds of pottery, fragments of bone, carbonised wood and seeds are the raw prime data upon which hypotheses are mounted. The British Iron Age, the millennium immediately before the Romans invaded Britain in 43 A.D. is my particular period of study. For this period there exists a wealth of raw data, the great majority of which is yet to be understood.

There are a few references to Britain to be found in the writings of the classical writers which are of limited help in explaining the archaeological material. Yet there is need to be extremely careful in accepting their statements uncritically. Nearly all the writers involved, particularly Caesar and Tacitus were politicians primarily and their work is to be judged with this factor in mind.

The archaeologist, therefore, has to focus almost entirely upon the field evidence and to mount those hypotheses which seem to fit the available evidence most adequately. Many hypotheses are necessarily deductive. For example, because they manufactured iron from the ore, they must have also manufactured charcoal. Evidence of the former process has been discovered by excavation, the latter process as yet has to be isolated. Similarly their agriculture at this time was both extensive and successful. Grain was exported to the continent. Indeed this factor is in all probability one of the major reasons for the Roman invasion in 43 A.D. Yet many of the agricultural processes that inevitably occurred have similarly to be isolated. One clear method is to conduct experiments to recreate the most probable processes in order to assess potential evidence that might survive archaeologically. Such experiments focus attention upon the minute detail of excavated data and not only allow statements of validity or invalidity to be made about the various hypothesised processes but also suggest new and improved techniques of excavation. Because much of the data at present only indicates 'presence or absence', hypothesis formulation and experimental testing are necessarily exploring the boundaries of probability. The best example here is the growing of prehistoric cereals. Carbonised seed recovered by excavation can, at this time, indicate only that this or that crop was grown. By growing the crop under different controlled agricultural conditions, probable yield figures can be achieved. In addition the need for further processes, previously unrecognised as significant with the archaeological data become apparent.

It is in this context that one further major aid to the formulation of archaeological hypotheses is to be found. This is the specific study of similar extant agricultural systems. While this approach is fraught with danger,

provided that the information achieved is recognised only as a potential guide rather than a complete answer and provided that there is no attempt to translate into the remote past present human organisations, there is a clear reward to be gained from such a study. Within the research programme at the Ancient Farm one most important criterion has been adopted. For any valid purposes only temperate zones can be thus considered. The weather is the dominant factor in agriculture. The climate in the third and second centuries B.C. is directly comparable to that of the present day. Indeed this fact alone allows the overall research project to exist. Given the similarity, naturally there were the same vagaries and extremes with the general weather pattern which we experience today. Summers of intense drought like 1976 as well as the traditional damp summers for which England is reknowned. Even Tacitus described the weather in Britain as 'foul' (foedus) in the first century A.D.

This criterion clearly limits the ethnographic parallels which can justifiably be studied. In general terms these are the western sea board of Europe and the north west coastal and mountain regions of Spain. It is only these last named regions which have largely escaped the agricultural revolution which has radically altered the appearance of the countryside over the last three decades. The invention and introduction of chemical fertilizers, herbicides and pesticides with more complex and efficient machines have completely changed farming techniques. These innovations have undoubtedly increased productivity but the cost may yet prove to be too high. The direct result has been a tremendous decrease in the agricultural labour force. Where once twenty men were required to run a farm, the same work is now achieved by two or three. The abandonment of traditional manuring systems in favour of chemical nutrients is severely damaging the crumb structure of the soil allowing erosion to take place where it has never happened before. The use of larger and necessarily heavier machinery

is producing compaction and hard pan in the subsoil. In turn even more powerful machines are required to break the hard pan thus formed. Inevitably this latest development poses the greatest threat to our archaeological heritage.

In many parts of Spain, however, this revolution has failed to make the same kind of impact as in western Europe generally. The historical and political reasons why this is so is not the concern of this paper. Rather it is to underline the need for immediate research in these regions in order to record as much as possible before the revolution reaches here as well. It is an unique opportunity to preserve for posterity a 'living past'. Farming is still labour intensive and to a great extent non-mechanised. My own objective, on several study tours, has been to record all those activities, processes and structures which seem to have direct relevance to the archaeological record as evidenced by excavation for the prehistoric and Romano-British period.

The most remarkable and striking feature is the landscape of north-west Spain itself. Wherever there is cultivable land there is a patchwork of tiny fields. In certain regions especially in the province of Lugo these are still primarily arable fields where grain and maize are the principal crops. However, along the coastal strip large areas of one-time arable fields are given over to a grass economy with only occasional areas being ploughed. Similarity of these field systems to the 'celtic fields' of Southern England is quite remarkable. The lynchets, the low banks which form on the downhill side of the fields, have survived in England as field monuments principally because the system of agriculture changed from arable to pastoral probably in the third century A.D. With the intensification of arable agriculture in England at the present time, each year several hundreds of hectares of old pasture are being ploughed up and many of these celtic fields are being destroyed. In Spain, on the other hand,

it is possible to see such a landscape as a physical operational entity. The ploughs, or rather, ards are arguably the direct descendants of the Roman sole ard described by Virgil in the Georgics. The work of this type of plough, similar in its effect on soil movement to the beam ard of the Iron Age, can be studied with great advantage. Especially is this so because the farmers possess the expertise of innumerable generations. They have the intimate knowledge of their tools which is obviously denied those who merely study a fossilized landscape. Their cattle are trained to a high level of efficiency and react to a word of command. Remarkably at the end of a furrow the command is 'Whoa!', a word previously thought by the writer to be peculiarly English.

It has long been an attractive hypothesis that the size of 'celtic fields' in England, ranging from 0.1 to 0.3 hectares in area, represented the area of land that could be ploughed and cultivated within a day. Land tenure, however, especially as a result of inheritance laws, is of much greater significance in determing field size in Spain. When it becomes impractical to subdivide a field with specific boundaries, stone or wooden marker posts are set up. It is not unusual to see a small field of c. 0.2 hectares growing several different crops side by side. Perhaps excavation of celtic fields might yield the post-holes of such marker stones suggesting the need for an alternative hypothesis.

Still of greater concern is the observation of a grass economy in operation over an area of previously arable fields. The principle of zero grazing, the provision of fresh cut grass for cattle which are not allowed to graze the land, is widely practised along the coastal plain. It is, of course, a most efficient way of maximising the return from the available land

area but it would be a virtually impossible practice to isolate archaeologically. In addition since the lynchet banks are also used it suggests the further hypothesis that both arable and grass economies could have been operated in conjunction one with the other. The field area was utilized for crop production, the lynchet banks for foddar production. In order to maintain good grass production annual manuring is carried out in exactly a similar way to arable practice. Evidence for manuring fields in psehistory has been adduced from the recovery of abraded sherds of pottery found on fields remote from settlements. The sherds are thought to have been transported there from the farm midden and subsequently abraded by plough action. If the final system was grass production, it might just be possible to isolate the practice archaeologically, by finding non-abraded potsherds in the ploughsoil which had been brought out from the farmstead midden.

While it is necessary to study the agricultural processes, the structures which are the relatively more permanent objects deserve particular attention in so far as they represent the storage and maintenance of crop production. Such structures are of considerable importance to the prehistorian since by observing the kinds of foundations necessary for their construction and the function marks made which are likely to survive archaeologically, possible parallels may be drawn. Grain storage is undoubtedly the most important single element that can be isolated.

In north-west Spain there would seem to be three basic types of structure employed in grain storage excluding the underground silo. The best known of all these structures is perhaps the 'horreo'. Its distribution is largely concentrated in Galicia. Made principally of stone, usually granite, although there are a number of wooden versions, the 'horreo' comprises a narrow chamber

raised up on four or more columns or posts. These posts are usually stone. Set between the top of the posts and the bottom of the chamber are large horizontal stone discs. These discs prevent rodents from climbing up into the chamber. The chambers have shallow-pitched tiled rooves. The gables are usually distinguished, at one end with a cross and at the other with a spike. Both are pagan symbols. The side walls of the chamber are normally slatted or vented in such a way as to allow free passage of air but inhibit rain penetration. Often the ventilation holes are arranged to provide a pattern. The axes of these structures seem to be set at random.

Their length varies enormously although their width seems to average c 1.50 m. The height of the chamber is usually c 2.0 m. The columns or posts raise the structure c 1.80 m from the ground. Access is usually through a wooden door set in one end of the structure reached by a wooden ladder or free standing set of stone stairs. The gap between the top step of such fixed stone stairs and the access to the 'horreo' is wide enough to stop rodents from jumping it. The second largest 'horreo', the largest stone one, is to be found at the 'Mission Biologico' just outside Pontevedra. The largest one made of wood is to be found in that neighbourhood but is now in a state of disrepair.

Their function, as observed by the writer, is principally for the drying and storage of maize cobs. The storage capacity of the structure varies considerably and can be crudely expressed as a function - length x 3 in cubic metres. However, since the cobs are stored loose it is virtually impossible to discuss the weight of crop normally stored. This system of storage is mirrored exactly by the much larger wire cages to be seen in the maize growing areas of Canada and the United States.

In the more remote rural areas of Pontevedra and Galicia a much cruder and simpler type of 'horreo' is to be found. This consists of a circular wicker basket, slightly narrower at the base than the top and some 1.50 m tall. The average diameter is c 1.50 m. It is placed on a platform raised off the ground by wooden or stone posts with the usual horizontal slabs between the tops of the posts and the structure itself. A conical thatched roof keeps the stored contents dry. On all those observed by the writer the thatched roof was made of maize stalks. A small wooden door is set in the bottom of the basket through which the maize cobs can be extracted by gravity feed. It is, perhaps, this design which may be the descendant of prehistoric above ground storage structures. If such a structure were caulked with daub to make it waterproof it would be admirable for storing grain. Being raised from the ground it would be as rodent proof as the more sophisticated stone 'horreos'. The post-hole pattern, however, would be exactly similar to that discovered on a large number of Iron Age sites.

The third variety of structure is quite different to those described above. It too is supported above the ground by posts or columns and similarly stone or wooden discs are placed between the tops of the posts and the base of the structure. They are normally square in plan c 4.30 m x c 4.30 m and made of wood. The framework is made of massive timbers jointed together. The plank floor is supported by three main joists. The walls c. 1.50 m high are made of vertical planks fitted into a slot cut into the main support timbers. The average thickness of the planks is 0.05 m - 0.07 m. The roof is formed by setting four main rafters from each corner of the structure to an apex. Subsidiary purlins are attached to these rafters to support either tiles or thatch. The tiled rooves are at a lower pitch than the

thatched rooves.

The distribution of these structures is principally along the coastal plain, in Galicia and especially throughout Lugo province. They are said to be used as store houses for maize and corn. Some even have a veranda built around the structure where maize cobs are laid out to dry in the sun. Regularly ploughs and other implements are hung under the eaves of the roof. Occasionally the space beneath the structure is used to house carts and other equipment.

The massive nature and skilled construction of these structures suggests that they are quite capable of being used for the storage of loose grain. Indeed this is quite probably the reason for their strength. If filled with loose grain, they ha ve a potential average storage capacity of 25 tonnes. Two thirds of this weight, some 16 tonnes, would be exerted in the form of lateral pressure against the walls. Further, these structures are generally to be found in grain-growing areas.

Their archaeology, four major post-holes, again is attractive for hypothesis formation for Iron Age sites. Particularly is this so in the case of the Danebury Hill Town in Hampshire.

None of these types of structure as seen by the author were being used for the storage of loose grain. The majority contained old tools and equipment. Many were in a state of disrepair suggesting that their original function had been superseded.

In several places grain stacks were built immediately beside such structures. Perhaps after threshing, the grain used to be stored in them. In this connection, in direct contrast to southern Spain where circular threshing floors are common, there is a distinct absence of any organised threshing system. It is hardly likely that it was done by hand. The writer observed one woman threshing sheaves of grain by beating the heads over a raised stone. Reluctant grains were beaten out of the ears with a stick. Archaeologically there would, of course, be no trace of this process at all.

This paper has presented a brief survey of those structures and processes which are representative of an agricultural system which will soon be completely lost. The major emphasis has been directed toward the field systems and storage structures which are at present extant and which have a potential bearing on our understanding of the remote past. Clearly there are a large number of questions which are raised by this survey alone. The time available for obtaining answers to these and other important questions is now extremely limited. It is vital that a specific research programme be devised and implemented as soon as possible. It is important that such a study should take place not only as an aid to prehistoric archaeology but also for its own sake.

Peter J. Reynolds, M.A.,F.S.A.
May 1978.