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STORAGE AND THRESHING IN PREINDUSTRIAL EUROPE : AN ADDITIONAL NOTE

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In the overall picture of grain storage techniques I proposed in my paper in Tools and Tillage (VI, 1), some facts are missing, either because I overlooked them, or because I was not aware of them at the time of writing. Here are a few of them, with the comments I have felt induced to make.

1. Storage of grain with chaff.

Owing to often incomplete descriptions, the importance of grain with chaff as a stored item may well be quite underestimated. An interesting example turns up in Thomas Jefferson's agricultural papers (Betts 1944, 1953), to which the editor has added an account by the Duc de La Rochefoucault-Liancourt of a visit he paid to Jefferson at Monticello in June 1796.

In the country south of the Potomac and east of the Blue Mountains, writes La Rochefoucault-Liancourt, wheat is exposed to a peculiar scourge, a "worm" (insect) by which the harvest may be entirely destroyed if left unthreshed. Since, on the other hand, the grain would rot and spoil if stored in bulk, the only way left is to keep it mixed with chaff, and to put off the winnowing until it is to be sent to the mill or to the market. Here is how Laroche foucault-Liancourt explains this mode of storage :

"... the heat occasioned by the mixture of grain with its envelope, from which it is disengaged, but with which it continues mixed, destroys the vital principle of the egg, and protects the corn from the inconveniences of its being hatched." (Betts 1944: 243.)

1. Rat-guards.

Rat-guards are stone or wooden discs inserted horizontally between the posts and the supporting beams of elevated buildings, in order to prevent the climbing of rodents. Since rat-guards were lacking in the descriptions and pictures of elevated granaries known to me in Africa and Southern Asia, I had admitted their absence from those regions as a working hypothesis.

Eastern Timor (formerly a Portuguese colony, now in Indonesia) is an important counter-example. Many of the numerous photographs of elevated houses and granaries published by Ruy Cinatti et al. (Arquitectura timorensis, Lisboa, Museu de Etnologia, 1987) show large and conspicuous rat-guards. Until more information is available, any further comment would be idly speculative. However, the Timorese exception (if it is one) at least suggests that rat-guards, if they are a detail, are a detail well worth studying.

By modern standards, of course, this explanation explains nothing. But our information is much too scarce to enable us to go further. We do not even know what species of insect was responsible : Jefferson alludes to the Hessian fly and to "weavils", but in other contexts. The only certain thing is that wheat had to be kept in store threshed, but not winnowed. When he had a Scotch threshing machine installed at Monticello in 1796, a few weeks after Larochefoucault-Liancourt's visit, Jefferson was careful to have the fanners removed, so that the grain could be threshed without being winnowed. (Betts 1944: 546, et 1953: 70, 201, 314.) Prior to the coming of the threshing machine to Virginia, wheat was trodden out with horses.

2. Threshing by horse-treading, indoors.

As I have tried to show in my paper, and as it is confirmed by the Virginian example, harvesting, threshing, winnowing and storage techniques are usually connected with each other, so much so indeed that it is virtually impossible to understand them separately. That is the reason why I proposed to identify several harvest-to-storage "systems" in preindustrial Europe.

The most historically significant of those systems were based on sickle-reaping and the making of sheaves, and the main features necessary to distinguish them from each other were the following :

- immediate vs. delayed threshing, implying the storage of grain in bulk (threshed) or in sheaves (unthreshed) respectively;
- open-air vs. indoor threshing;
- threshing using human power vs. animal power.

These features can be combined in eight different ways theoretically, but in my paper, I described three systems only, which I called Mediterranean, North European, and Atlantic Coast system respectively. What about

the five other combinations ? The best way to make them out is to have a look at the following table, where all the theoretical combinations are gathered :

EUROPEAN SYSTEMS OF THRESHING			
Time and place of threshing		Power used in threshing	
		Human power only	Animal power
Immediate	Open-air	Atlantic Coast	Mediterranean
	Indoors	-	North Hungarian
Delayed	Open-air	-	-
	Indoors	North European	?

The combinations corresponding with the three boxes marked (-) are probably impossible, at least in European conditions. By its very nature, delayed threshing can hardly be executed in the open, except perhaps in completely rainless climates not to be found within the boundaries of Europe. And conversely, when threshing is done indoors by the use of human power only, there is no point in hurrying to thresh the whole harvest at once, since the very aim of the system is to allow the work to be done day in day out. I know of no example to fill the three boxes left void, and my guess is that none will be found.

But having the grain trodden out by animals indoors is a combination that does exist, and since its importance is comparable to that of the Atlantic Coast system of Western France, I should not have ignored it in my paper. I have called this system "North Hungarian" because it is well documented in Northern Hungary and neighbouring Slovakia (Paládi-Kovács 1987, Selmeczi Kovács 1976, Urbancová 1976). But there is also an example from as far away as Southern Chile (Golte 1973: 61), suggesting that this system may have been practised in other European settlements overseas as

well. I have supposed in *the* table that threshing by the North Hungarian system was done immediately after the harvest, and I have therefore left the other possible box for it (delayed threshing - indoors - animal power) with a question mark. But the fact is that I simply do not know, and further information is needed.

The Mediterranean and North European systems are diametrically opposed by many of their features. The Atlantic Coast and North Hungarian systems stand in between, like hybrids so to speak, and their rather limited areal distribution suggests that they were probably not optimal solutions economically. As I have already pointed out, their ^{early} history is obscure. But in the case of the North Hungarian system, the following phrase from Varro's Rural Economy shows that something like it was perhaps already in existence by the first century B.C. : Non nulli etiam tegunt areas ut in Bagiennis, quod ibi saepe id temporis annui oriuntur nimbi ("Some people even roof the threshing-floors over, as among the Bagienni, because showers always occur there at that time of the year"). Although very short, this description leaves little doubt that threshing was immediate. The Bagienni or Vagienni are said to have been a people inhabiting Liguria.

3. Threshing by animal-treading, Northern Europe.

In my preceding paper, I have mentioned two cases of threshing by animal-treading in non-Mediterranean Europe : Oberschwaben (Germany), and Brittany (France). Both are documented from the first half of the 19th century. Did they come about during, say, the late 18th century, as part and parcel of the diffusion of new animal-drawn threshing devices that affected many areas of Europe at that time ? Or may we suppose them to be earlier, and to have been more important in the past ? What evidence is currently available ?

I have no further information on Oberschwaben. But in Brittany, grain threshing by horse-treading in the early 19th century has now been reported from four sites, three of them isles; they are Groix and Houat,¹ in addition to Belle-Ile-en-Mer and the Penmarc'h Peninsula which I had already quoted (map). Until data from earlier periods have been found, no certain conclusion can be reached. But this rather strange geographical distribution does not fit well with the hypothesis of a recent origin. The new threshing methods making use of animal power that developed in many areas of Europe in the 18th and 19th centuries were usually promoted by enlightened landlords and administrators, by agricultural societies, etc.² That such people would have precisely selected the remotest and most agriculturally backward places they could possibly find in Brittany for furthering innovations does not appear very plausible. Besides, they would have promoted animal-drawn rollers or any other mechanical contrivances, but probably not the simpler technique of horse-treading, which as far as they were aware of it, most of them would have deemed primitive and wasteful. Indeed, what happened in another small isle off the French Atlantic Coast, the Ile de Ré, can be used as a kind of control, so to speak. There, horse-drawn threshing rollers were never heard of before a demonstration organised by the Société d'Agriculture de La Rochelle, as late as 1842. Afterward, threshing rollers acquired some importance, but the flail was not given up before the coming of true threshing machines well into the 20th century. As far as our documentation goes (which is not very far, actually), horse-treading was unknown, either before or after 1842 (Tardy 1982).

Finally, I would like to mention two points that may or may not relate to this topic.

The first is the presence, in the Pays de Caux (Eastern Normandy, France) of an implement called bat-blé (litt. "wheat-thresher").

least the middle of the 18th century. This implement was made of a number of old cart wheels mounted on the same axle, not unlike some of the threshing wagons invented in Sweden in the 18th century. But the problem is that this "wheat-thresher" was exclusively used for rolling the fields over after ploughing, and there is not the slightest evidence for the moment that it may have been used for threshing. So the name bat-blé, on the significance of which there is little doubt, is an enigm. Unfortunately, in the present state of research on these questions in France, we can only rely on chance for a solution.³

My second and last point relates to the tribulum. I wrote in my paper that the archaeology of the tribulum was a mystery. I happened since to rediscover what may possibly be the only find in Europe for which an interpretation as remains of a tribulum was proposed. Here is how the author of the find, General Pitt-Rivers, describes it :

"Nothing was found until we came to the part beneath the crest [of the rampart] where 445 flint flakes were found lying on the old surface line, being contained within an oblong space of 4' 6" by 2' [about 140 cm X 60 cm] [...] The flakes had for the most part bulbs of percussion and facets, and were undoubtedly prehistoric flakes, there being no possibility of mistaking them for flints fractured for road making. But they were not well-formed flakes such as might have been intended for use as knives; they were wasters or else flakes of the kind that might have been used in a tribulum^e for threshing corn. Indeed the oblong space in which they were found almost suggests the possibility of their having formed part of a tribulum [...] There was, however, no trace of wood, and the flakes in many cases were found touching one another.

^eTwo of these still in use in Cyprus and in Assyria, the survivals of similar ones used formerly by the Romans, are in my Museum in the village of Farnham, Dorset.

This is an extract of Excavations in Cranborne Chase, vol II, p. 239 (1888), and the site of the find was Winkelbury Camp, South Wiltshire. The only thing to be added, perhaps, is that this number 445 is quite the average to be observed on modern tribulums. I have no idea of where those 445 flint flakes might be by now. Let us hope that some detective-archaeologist will excavate them again from museum dust some time.⁴

N O T E S

1. I am indebted to M. François de Beaulieu for these informations. It seems pretty certain that horse-treading was totally unknown in continental Brittany, except for the Penmarc'h peninsula.

2. This development of animal-drawn threshing contrivances occurred both in Northern and in Southern Europe, but it has been extensively studied in Northern Europe only : see Berg 1981 for the case of Sweden and the relevant literature on other countries. In France, the use of threshing rollers developed at the expense of both horse-treading (Mediterranean system) and immediate flail-threshing in the open (Atlantic Coast system); see Parain 1937, and Aubin & Eches 1985.

3. Informations on the bat-blé have been gathered by Michèle Bachelet (1985, pp. 111-112). The instrument itself is described in 1820, but its name is not explicitly recorded before 1922.

4. I have presented the General Pitt-Rivers' find at a symposium on "L'exploitation des plantes en préhistoire, documents et techniques", organised by Patricia Anderson-Gerfaud at the Jalès experimental farm (Ardèche, France), 14 to 18 June 1988. The occasion was a paper presented by Kathryn Ataman on "Threshing sledges and Archaeology. A modern tribulum from the Near East decorating the meeting room made the discussion quite lively.

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MAP. - THRESHING AND STORAGE SYSTEMS, FRANCE, 19th CENTURY. LEGEND.

North of continuous line : delayed threshing by human power only (mainly with flails) in barns, storage of grain unthreshed, in sheaves; North European system.

Between continuous and broken lines : immediate threshing by human power only (mainly with flails) in the open, storage of threshed grain; Atlantic Coast system.

South of broken line : immediate threshing by animal power (treading) in the open, storage of threshed grain; Mediterranean system.

Shaded area : probable maximum extent of animal-drawn threshing devices (mainly stone and wooden rollers) after the mid-19th century.

Places referred to in the text :

- (1) Penmarc'h peninsula
- (2) Isle of Groix
- (3) Belle-Ile-en-Mer
- (4) Isle of Houat
- (5) Isle of Ré

(After Parain 1937)

