

MILL-TECHNOLOGY within ORViAMM (TECHnORViAMM)

AIMS of RESEARCH

At the present state of research, what is unknown about Roman mills is wide and is mainly concerned with three fields : the types of millstones been produced in Orvieto, the origin(s) of the Pompeian-type rotary mill and how it really works. To be convinced of it let one just wonder how was flour collected? Was there place enough for a donkey to go around the mill in the Pompei or Ostia bakeries? Was launching the mill easy? Or even what does Vitruvius sentence mean when he seems to write mills and kneading-machines were moved by the same motion¹ ? We believe that simple tracking of a type-series sequence along chronology would not be able to throw light enough on these questions and that a technological approach is worthwhile and necessary. We need, with the helps of mechanics, to understand how a Pompeian style mill runs, which continuities and shortages they are between types and whether some of them present functional advantages. It seems also important that typology be not only morphological but technologically informed. Finally it would probably be of some benefit to search among finds, and may be among iconography, at least on production areas or at bakeries, artefacts or clues we presently miss (as for instance irons for mechanisms, configuration of working area for mills and kneading machines).

The ORViAMM project is therefore intended to take on Orvieto's millstone and Pompeian mill production through anthropology of technics, hoping it would invest all sections of the research relative to objects production and shaping areas.

Such an approach will cover several levels :

- **products** : on rough-outs, on splinters, on by-products, on shaping remains and places, on millstones and kneading-tanks
- **spaces** : on shaping places, over boarding areas, on using-places (such as grinding workshops, urban bakeries, domestic mills and housings)
- **function** : we well try to define on one hand the Orvieto rock quality, its advantages or not, its shaping ability and its restrictions; on the other hand millstones will be taken under the point of view of functional and technical logics to which they could correspond.

Subsequently, though it may be reminded the actual elaboration of research is done without any cooperation with technologists, ORViAMM will approach mills and millstones with three working lines :

1- Millstone production in Orvieto :

- . work will be concerned with passing from rough-outs to shaped millstones (with a precise definition of what –like probably marking or joining stones- takes place at the boarding stage or at the final setting (with caving of mount and lug holes)
- . technical and chronological series will be studied and also their standardization rate (the new millstones from La Svolta do not look to be so regular)
- . these series will be defined as distinctions will be made among them between various sizing; it seems in fact that the millstones being observed in Orvieto reflect a larger diversity than suggested by the usual categorizing within domestic manual mill, Pompeian manual one, Pompeian donkey mill and hydraulic one; can we also be sure that a small frequent diameter (ca. 50 cm) is enough to define a manual or a domestic mill?
- . examination or reconstruction will take place about the operating chain, working places, tools and technical gesture (with an eye to possible use of wheel-throwing); continuities and shortages along the times will be pointed out (with an attention to possible local genesis of models and to hispano-punic or south-italic possible influences;

¹ « *eadem versatione* » : Moritz 1958 p. 122, note 3

. the study will pay attention at each stage to material remains of shaping and to by-products and waste, even to those which could have not been preserved or not located on the observed locations.

Technological approach (standardization, working places, technics used, variability etc.) seems to be likely to contribute to an understanding of the quarry status and that of the working people. (cf. ORViAMM chapter II.12).

2- An Experimental Pompeian mill : the technological section of ORViAMM will include the experimental reconstruction of a Pompeian mill (drawing and stone-working of a *meta* and a *catillus*, elaboration and realisation of mechanism and wooden frame, study of motion needs and system, of lifting pieces and system; initial launching, current motion and regularity; grain introduction and net flavour gathering). Such an experiment will be prepared with contribution from an Italian mechanics engineer (conception and technical drawing of frame and mechanisms; study of friction, inertia, launch, braking, grinding distance; influence of stone quality, grinding ability for other than grain; possible matching between mill and kneading machines, possibility of motion by top). This experimental section will call in contribution from S. Coadic, a Roman machine archaeologist and from J-Cl. Bessac, a specialist within the CNRS for extracting and stone-working.

3- Roman mill Iconography : a complement to this section will be concerned with collecting and study of Roman mill iconography. This part will be realized by prof. A. Buonopane, University of Verona, for figurative representations can sometimes bring elements to a reconstruction and comprehension of the mill and sometimes also bias functional reality, thus throwing light onto specific aspects of representation of making process, of machines and technics in Antiquity.

PERIPHERIAL ACTIVITIES

Filming : video sequences of quern extraction and shaping, of technical phases and drawings, of assembling frame or mill, recording working noises, interviews, questions from school-kids or people

Popularization : making of an illustrated free powerpoint to put on the ORViAMM web site, public lecture in Orvieto, open day for public experiment of the mill at the museum or on the archaeological site; integration of the reconstructed mill in the permanent exhibition at the museum; possible 2 days colloquium on experimental archaeology.

Publication : papers about the reconstruction of the mill (millstone shaping, wooden frame realisation, lifting and axing system, trials, animal motion, flour production), possibly a monograph.

Products: splinters and waste to record and archive, films, reports, publications, Pompeian-type mill for the museum, blisters and pride.