

Roman salt production in the *civitas Menapiorum*. A study of the implemented technological process on the salt production sites through the analysis of the briquetage from the region Zeebrugge-Dudzele

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Salt (NaCl). Its daily intake was never as high as now and throughout history it was, contrary to other spices north of the Alps, a relatively fair commodity for most in society. To keep up with the demand, the Roman state stimulated the salt production which caused a growth in sites along the coast of the *civitas Menapiorum* (northern France, Belgium and the southern part of the Netherlands (Walcheren)). French and English researchers focused on the Roman salt production in their respective countries, but didn't include the Menapian coast. Hugo Thoen did study the salt production in this region in the '70- '80, but little research has been conducted ever since and the briquetage pottery [1] was never fully analysed. During this research, the briquetage pottery was analysed for the first time and linked to the technological process in a joint project (master dissertation) of Ghent University [2] and Raakvlak [3].

Usage and importance of salt in the Roman period

Mostly the word 'salt' refers to the soluble white sodium chloride (60,6% chloride and 39,4% sodium), which can easily be exploited. It naturally occurs in two ways: in seawater or in geological layers. The latter were formed, mostly during the Triassic period, when isolated seas evaporated and the crystallized salt accumulated. Chemically speaking salt should be described as an evaporite: a collective of minerals crystallized out of a mineral-saturated aqueous solution like seawater. On average seawater of the North Sea contains 3,5% salt whereof 75% sodium chloride and a series of more (KCl, MgCl₂, MgSO₄...) and less (MgCO₃, CaSO₄...) soluble salts. These highly soluble salts are more popularly known as bitterns because these elements give salt a bitter aftertaste. From a biological point of view, mankind is in constant need of salt because it leaves the body on a permanent basis through body liquids. A regular intake is therefore required to keep the balance in check. To do so, salt needs to be added as a spice while preparing food, since it is lost from organic products via cooking. Also various other usages of salt are commonly known from historical and archaeological sources: as a preservative for food, an ingredient in dairy products or fish sauce and as a flux in glass or metal production.

A significant number of epigraphic and archaeological sources point to the presence of a well-developed salt industry in the *civitas Menapiorum*. Noteworthy are the inscriptions dedicated by the *salinatores civitatis Menapiorum* and the *salinatores civitatis Morinorum* in honour of *Lucius Lepidius Proculus*, a centurion of the VIth legion based at *Novaesium* (Neuss) during the *Civilis*-uprising (69-70 AD). Based on these inscriptions, researchers assume not only an important salt industry, but also an important connection between the Menapian North Sea coastal salt-works and the Roman Rhine army. Another group of inscriptions pointing to the economic importance of salt in the Menapian *civitas* are the *Nehalennia*-altars, a large collection of votive stones originating from a sanctuary frequented by shippers and merchants travelling back and forth from the continent to *Britannia*. Of all professions attested on the stones, *negotiator salarius* (salt merchant) and *negotiator allecarius* (trader in salted fish sauce) are the most common. Moreover, the provenance of these merchants suggests strong trading connections between the Rhineland, the coastal area of the *civitas Menapiorum* and *Britannia* for salt and derivative products.

Salt production sites

Based on literature (excavation reports and surveys) an overview of the briquetage sites was created. In total eighteen briquetage sites dating from the late Iron Age until the Roman period were identified. The presence of briquetage pottery in the coastal plain is often associated with salt production sites. These sites were located somewhat inland, to avoid open sea influences, and alongside tidal channels close to the better habitable and higher located sandy hinterland. However, this number of production sites should be nuanced for multiple reasons. First and foremost, certain sites with circumstantial

evidence (e.g. a convenient location, a handful of briquetage fragments etc.) were too swiftly considered as salt production sites. Moreover, the relevant sites were often excavated a long time ago on a small-scale whereby the finds were never investigated and fully published. Subsequently several smaller sites were likely part of the same salt production complex. Keeping this in mind it is possible that the interpretation of several salt production sites may and probably should be adjusted in the aftermath of new research.

Salt production techniques

In the northern provinces of the Roman empire climatological conditions severely impeded the application of the Mediterranean system of open air-extraction in salt-works through natural evaporation. In these remote areas, abundant precipitation, lack of long-term sunshine and too cold winds obstructed the crystallisation of salt via solar energy. In Antiquity, only the more energy- and time consuming technique occurred: the artificial heating of a brine in containers of so-called “briquetage pottery”, placed in hearth-like structures until salt crystals formed. Based on archaeological observations in whole Europe, this complex production process could be divided theoretically in 8 production phases: (1) raw material procurement, (2) creating a salt hearth, (3) the production of briquetage, (4) creating a brine, (5) salt crystallisation, (6) salt drying, (7) salt transport, (8) debris deposition. Even though these steps are presented more or less chronological, it’s certainly possible that several actions were conducted at the same time. Moreover, existed certain variations within each production phase which caused from site to site slight changes in the production process. For example: there were several ways for creating a salt hearth or preparing a brine. Also exist numerous types of briquetage pottery and -elements which makes it difficult to determine the production process. Inevitably slight changes occur on every site based on the available resources and the choices of the salt-producers.

As mentioned before, the Roman briquetage pottery in the *civitas Menapiorum* was until now never fully analysed. To examine the potential of this pottery group, this essay focused on the Roman briquetage pottery of salt production sites from the area of Zeebrugge-Dudzele. This study concluded that the briquetage pottery had a more extensive typology than previously known. In this region rectangular containers (type C1) were used alongside cylindrical vessels (type C2 and C3). The latter could be subdivided based on a straight (A-variant) or a profiled base (B-variant) which was probably the result of the implemented construction method. The support elements were divided into two categories with several types: pedestals (used in vertical position to balance the vessels above the fire) and stabilisers (little objects attached to pedestals or vessels to keep everything stable during the evaporation process). The salt producers probably used the shallow rectangular vessels for heating the brine above a fire, followed by an immediate removal of the formed salt crystals to avoid contamination. After that they scooped the salt crystals in cylindrical vessels to dry. Subsequently, before the containers were transported to the hinterland, the salt makers removed the pottery-bases to clear out potential contaminations and to make a final check of their product. Given the fact that the containers were transported with the salt, their presence is used to claim salt consumption in the hinterland.

For bibliographic references and further reading see:

Dekoninck M., 2017. *Romeinse zoutproductie in de civitas Menapiorum. Een studie naar het technologische proces op de zoutproductiesites aan de hand van het briquetage-aardewerk uit de regio Zeebrugge-Dudzele*, master dissertation, Universiteit Gent (No Publisher).

References

- [1] In literature the term briquetage is used as a collective for pottery-objects used during salt production, for example the pots used for boiling seawater and storing dried salt (salt vessels) and the supports by which the vessels were balanced above the fire
- [2] Historical Archaeology Research Group of Northwest Europe (HARG)
- [3] Local heritage service for Bruges and the surrounding regions.