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**Aux origines de l'exploitation du sel en Europe.  
Vestiges, fonctions et enjeux archéologiques.**

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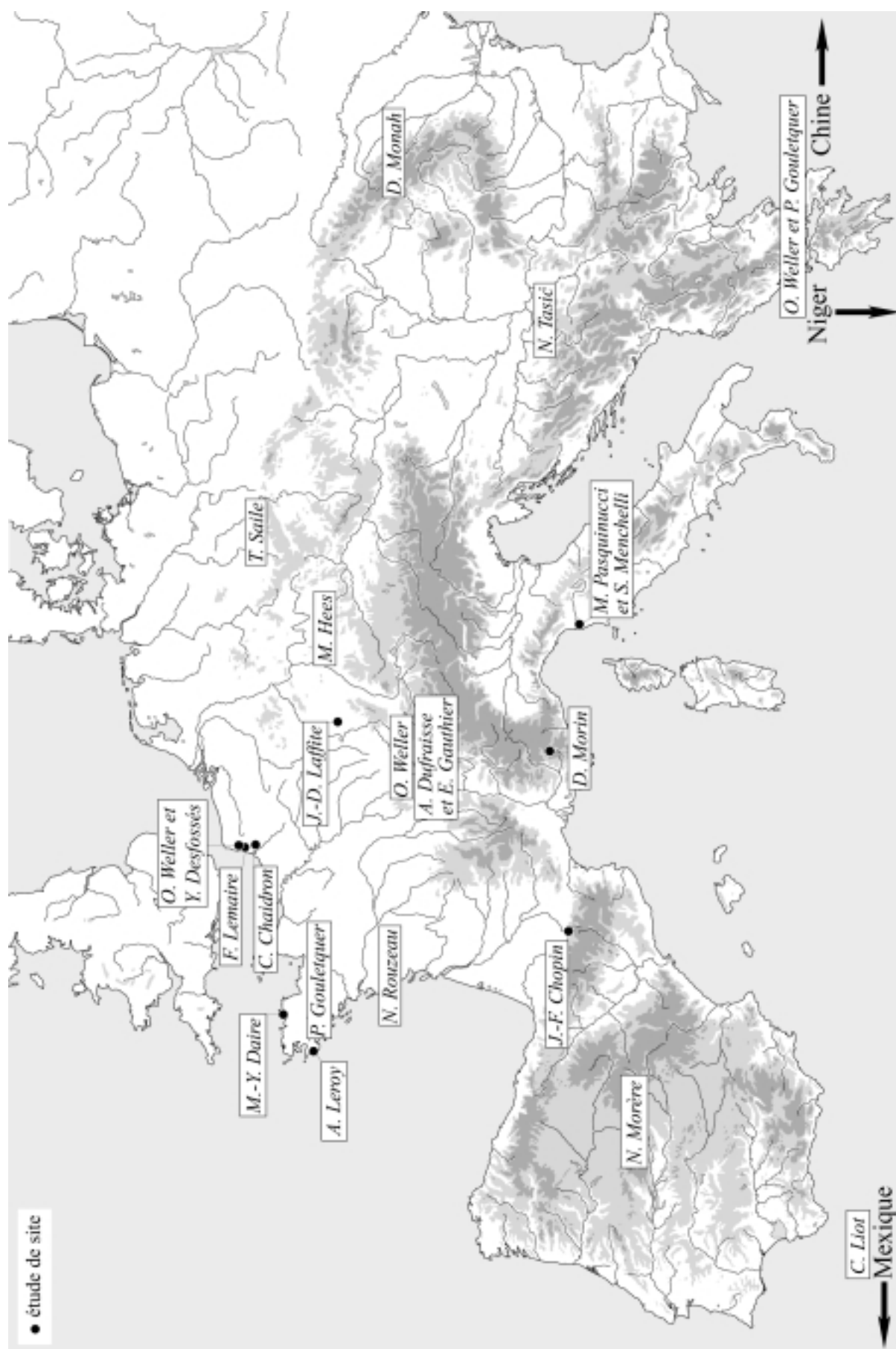
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## Foreword

The archaeology of salt has for a long time been a matter for local specialists. Born in the 18th century in Lorraine (de La Sauvagère, 1740) with the discovery of rather shapeless debris called briquetage, sometimes in huge quantities, it has never ceased to be a subject of investigation for archaeologists and scholars. It was only in the 1960s and 1970s that correspondence and exchange became more frequent throughout Europe, due to material that presented numerous similarities; this was to culminate in a salt weekend held in England at Colchester in 1974, edited by K. de Brisay and K. Evans (1975, *Salt the study of an ancient industry*). Since this international meeting, if one excepts the 1983 Marsal conference which is still unpublished, there have in fact been no further round tables or conferences on this theme, at either French or European level.

The present volume proposes to fill this gap by publishing the acts of two meetings on the archaeology of salt :

- A national Round Table on *Saltworking in proto-historic France and its margins. An updating of briquetage techniques*, held 18 May 1998 in Paris at the head office of the Comité des Salines de France ;
- An International Conference called *Archaeology of salt in Europe : the time of syntheses*, which took place 4 September 2001 during the 16th UISPP Congress at Liège (Belgium).

The first, national meeting on briquetage sites was mainly justified by new evidence on saltmaking from rescue excavations, mostly in northern France. Extensive excavation, together with environmental studies, offered the opportunity to reconsider salt production during the later Iron Age, from the point of view of both the techniques themselves and their chronological development. This round table also provided a chance to examine production techniques involving leaching of soil or salt mud, the productivity of Iron Age salterns, the Neolithic origins of saltmaking, as well as the history of salt archaeology.

The second, international meeting aimed to bring together European researchers studying production of this unique material from the Neolithic to the end of the Iron Age. This conference set out to review the state of knowledge, from the first sedentary societies up to the Roman period, by presenting unpublished

discoveries or reassessing old evidence, and especially by explaining specific approaches, involving either fieldwork, laboratory studies or bibliographical research. Dynamic work by researchers clearly illustrates that the archaeology of salt, for long neglected in Europe, is now perfectly integrated into archaeological research on the use of natural resources, production techniques, exchange networks and social organization.

Although the archaeological evidence is often meagre, current work on salt shows real diversity in research design and approaches adopted. The questions now go beyond briquetage and saltmaking techniques to include other types of production without the use of fired clay, as well as wider issues of environmental, socio-economic or political nature. At the same time, work on the emergence of saltmaking has shown that this was not just restricted to the Iron Age, as was thought only a few years ago, but clearly dates as far back as the earliest European Neolithic.

The diversity of approaches and fields brought together in this volume is also a consequence of the varied cultural and institutional origins of the twenty or so researchers involved. Young research students, contract archaeologists (INRAP, ex-AFAN), and established scholars from Germany, Belgium, Spain, Italy, Rumania and Yugoslavia have all met around an eminently soluble substance that has disappeared for ever.

Some have relied on entirely new fieldwork; others have continued work on previously researched zones; yet others have searched for new leads through bibliographical synthesis or by addressing the data with new questions; others finally have proposed more general reflections on the theme.

This new research on pre- and protohistoric salt production in Europe results from :

- large and medium scale rescue excavations, like the construction of the A16 motorway in northern France (Frédéric LEMAIRE, Yves DESFOSSÉS, and Olivier WELLER), the Moyenvic bypass in the Seille valley in Lorraine (Jean-Denis LAFFITE), or the Salies-du-Salat college extension in the Pyrenees (Jean-François CHOPIN) ;
- research excavation and systematic investigation

in certain regions, such as the Rumanian Carpathians (Dan MONAH), the Alps of Haute Provence (Denis MORIN), north-west Tuscany (Marinella PASQUINUCCI and Simonetta MENCHELLI), north Brittany (Marie-Yvane DAIRE), or the Vendée and Charente marshes (Nicolas ROUZEAU) ;

- multidisciplinary research projects combining an ethnoarchaeological approach with environmental studies, like the work on salt springs in Franche-Comté and Burgundy (Alexa DUFRAISSE, Emilie GAUTHIER and Olivier WELLER), or on the endoreic basins of Mexico (Catherine LIOT) ;

- new research on old documentation, backed up with survey, as in Finistère (Aude LEROY), and sometimes with experiment, as in Baden-Württemberg (Martin HEES) ;

- development of archaeological parks, with various attempts at reconstructing salterns (Cyrille CHAIDRON) ;

- new research leads opened up by bibliographical synthesis (Thomas SAILE), or by fresh examination of archaeological data, whether from the central Balkans (Nenad TASIC), the Iberian peninsular (Nuria MORÈRE) or various regions of Europe or even the world (Pierre GOULETQUER and Olivier WELLER).

In any case the reality which emerges from all these discoveries and the reflections they provoke is much more complex than one imagined. It involves technical aspects of salting (use of briquetage, other possible types of production, salt products), and also socio-economic factors (control over production and distribution, the role of salt in exchange), as far back as 5000 years before History.

In chronological order, the principal contributions of these meetings can be outlined as follows :

For the **Neolithic**, while it has constantly been repeated that salt is essential to human populations, especially when they become sedentary agriculturists and stockbreeders, several papers clearly show that the physiological argument does not adequately explain the archaeological evidence and that the reasons for the emergence of salting at the onset of the Neolithic must be sought elsewhere. From this point of view, questions of a socio-economic nature are fundamental to current research on early forms of salting.

The paper by Dan MONAH on the Rumanian Carpathians describes the earliest evidence for salting in Europe, dated to the late 6th millennium, then the appearance and development of briquetage sites in the mid-5th millennium, before discussing the central role that salt must have played at this time in settlement patterns and exchange.

Nenad TASIC proposes a model according to which salt, a resource that occurs unevenly in the central

Balkans, would have been an important element in exchange and ways of life of populations at the beginning of the Neolithic.

In the Alps, Denis MORIN presents the exceptional discovery, at Moriez at a depth of almost 10 metres, of a system for harnessing a salt spring. Dated to the earliest Alpine Neolithic, this wooden feature revives the issue of the exploitation and neolithisation of mountain areas.

Olivier WELLER offers a European tour of salting techniques. Using an ethnographic model derived from New Guinea and transferred to eastern France, he then reveals the existence during the Neolithic of new techniques for salting, using plants and wood rather than fired clay. The making and use of salt are finally related to settlement location, the distribution of wealth and population density.

The **Bronze Age**, for which there had previously been little evidence, has become a key period for understanding the appearance and development of briquetage techniques across Europe, around both salt springs and coastal areas.

Jean-François CHOPIN describes the second salting site discovered in the Pyrenees. Salies-du-Salat has produced tanks, a hearth and a large deposit of ceramic sherds dated to the Middle Bronze Age.

On the coast, the discovery by Marinella PASQUINUCCI and Simonetta MENCHELLI of the first pre-Roman Mediterranean salterns in Tuscany fills a considerable gap in the evidence. Here salting with fired clay starts as early as the Middle Bronze Age, well before the famous Roman salt marsh production at Ostia. Furthermore, their paper lays the foundation for initiating more extensive research on salting in Italy.

Thus briquetage does seem to exist in Mediterranean regions and this also underlies the lines of research proposed by Nuria MORÈRE in the Iberian peninsular. The inventory of findspots on the Spanish coast and interior is a means of characterizing salt production sites and their specific artefacts, so that they can be identified throughout the peninsular.

The **Iron Age** certainly remains the period for which evidence is the most complete, due to the massive appearance across Europe, in early Hallstatt and then late La Tène, of salterns using the briquetage technique to produce small, standardized salt cakes. Over the last ten years, progress has been made on production techniques, their chronology and geographical distribution, as well as the economic stakes involved in production. Salting can now be seen as a specialized craft activity, sometimes taking place within settlements, or even as a true proto-industry. Further work is now required on modes of control of production and distribution, as well as on the reconstruction of commercial networks.



In eastern France, at Moyenvic, Jean-Denis LAFFITE describes the new results of an excavation undertaken in the heart of the famous briquetage sites of the Seille valley (Lorraine). This saltmaking complex, with five salterns and forty or so ovens, four clay quarries and numerous preparation pits, broadly dates to early Hallstatt; it implies near-industrial activity in which the final moulding is not represented. In short, this is an unique and rigorous analysis of a site that lies right in the middle of the valley and its three million cubic metres of saltworking debris.

Marie-Yvane DAIRE examines all the archaeological finds from research excavation in north Brittany of two particularly well preserved late La Tène salterns, with ovens in which the last load had collapsed, tanks for treatment or storage and structural features, before discussing the overall working of the salterns and the length of time involved.

Nicolas ROUZEAU offers a reinterpretation of briquetage items in ash deposits in coastal marshes on the French central-west coast, and reconstructs a complex *chaîne opératoire* for these later Iron Age salterns in which leaching of burnt muds and natural brine concentration occur together. He then proposes a new estimation of the production, underlining the industrial nature of these salterns.

In northern France, where previously there was virtually no evidence, excavations in advance of motorway construction have uncovered large numbers of saltmaking sites dated to La Tène and these have been extensively investigated. Using data from excavation of two remarkably well preserved salterns at Sorrus (ovens, wells, wooden artefacts and structures) and from palaeoenvironmental studies, Olivier WELLER and Yves DESFOSSÉS present the complete *chaîne opératoire* of salt manufacture, as well as a first detailed chronology of briquetage items, linked to management of the environment and organization of production.

One of the ovens found during this rescue excavation at Pont Rémy has been experimentally reconstructed by Cyrille CHAIDRON. A series of experiments concentrated on the use of certain briquetage items and on crystallisation, though attempts to make actual blocks of salt were unsuccessful.

Martin HEES, dealing with the Iron Age in Baden-Württemberg, offers a regional overview of briquetage sites and the famous saltworks at Schwäbisch-Hall, together with a typo-chronology of technical items, comparison with evidence elsewhere in Germany and a study on the movement of salt cakes. An interesting series of experiments on the two oven types is then described.

On a broader scale, Thomas SAILE presents a bibliographical synthesis on the question of salt trade in central Europe. Even though proof is often lacking, the author suggests possible major circulation routes for salt in protohistoric Europe.

For the **Gallo-Roman** period, research has mainly developed around the Mediterranean basin, whether for the making or use of salt. There was little evidence elsewhere.

The rescue excavation at Conchil-le-Temple in northern France, undertaken by Frédéric LEMAIRE, goes a long way towards filling this gap. The author describes a site which is unique in its dating (Augustan age), its massive structural remains (oven and storage tank), the types of mould used and the estimations of quantities produced.

In south Finistère, Aude LEROY takes a new look at salting workshop sites through field survey and systematic recording. A classification of these workshops on the bay of Douarnenez, based on their local environment and type of construction, is suggested. The author then discusses their possible functions during the first centuries AD by comparing them to the famous Mediterranean workshops.

In addition to these archaeological studies, it seemed necessary to include other research of wider scope in the present volume, in so far as the approaches and results encourage broader reflection on the archaeology of salt and its future.

Catherine LIOT reviews techniques for working salt soils in Mexico, drawing on extensive archaeological, ethnohistorical and ethnographic evidence. The author also describes her own archaeological and environmental work on briquetage sites in western Mexico. This provides new information on the function of features around the salterns, on the range of materials produced and on production organization.

Alexa DUFRAISSE and Emilie GAUTHIER examine the development of salt spring working in Franche-Comté from the Bronze Age to the medieval period, from an ecological perspective. The multidisciplinary approach chosen, confronting pollen and charcoal studies, underlines not only the major impact of saltmaking on vegetation since the end of the Iron Age, but also characterizes the various modes of supply and woodland management.

Through his experience of saltmaking techniques, Pierre GOULETQUER not only sheds light on the history of the archaeology of this mineral, but also puts current research into perspective. He also offers a critical overview of the Comité des Salines de France round table and discusses major directions for future research.

Finally, as an epilogue written in 2002 after an expert assignment to China, he and Olivier WELLER use their experience of faraway briquetage sites, in Africa as well as China, to open a wider discussion, drawing on present-day examples, on the process of salt crystallization, a question which has for long been underestimated but which is nevertheless central for all those interested in the making of blocks of salt.

In conclusion, these two meetings which were three years apart provided the opportunity to review the current state of evidence on a European scale, as well as opening up debate on methodological questions posed by the study of this eminently soluble substance. While evidence has considerably increased in quantity and quality, it nonetheless remains very uneven, both geographically and chronologically. However, there is no doubt that the archaeology of salt today is no longer restricted to recovering and studying hundreds of fragments of fired clay, but sets out to understand the overall functioning of these original productions, to measure their interactions with the environment and to integrate them into the social, economic, cultural and symbolic spheres of the human groups involved.

#### *Aknowledgements*

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Olivier WELLER

*Translation Mike Ilett*