



Peril of the sea for the Mesolithic sites of Western France

Grégor Marchand

► To cite this version:

Grégor Marchand. Peril of the sea for the Mesolithic sites of Western France. *Méditerranée : revue géographique des pays méditerranéens*, 2021, 133, pp.87 - 96. 10.4000/mediterranee.13340 . hal-03867162

HAL Id: hal-03867162

<https://hal.science/hal-03867162>

Submitted on 23 Nov 2022

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



Méditerranée

Revue géographique des pays méditerranéens / Journal of Mediterranean geography

133 | 2021

Les paysages littoraux

Peril of the sea for the Mesolithic sites of Western France

Les sites mésolithiques de l'ouest de la France au péril de la mer

Grégor Marchand



Electronic version

URL: <https://journals.openedition.org/mediterranee/13340>

DOI: 10.4000/mediterranee.13340

ISSN: 1760-8538

Publisher

Presses Universitaires de Provence

Printed version

Date of publication: 15 October 2021

Number of pages: 87-96

ISBN: 979-1-03200-361-9

ISSN: 0025-8296

Brought to you by Université Rennes 1



Electronic reference

Grégor Marchand, "Peril of the sea for the Mesolithic sites of Western France", *Méditerranée* [Online], 133 | 2021, Online since 07 July 2022, connection on 21 July 2022. URL: <http://journals.openedition.org/mediterranee/13340> ; DOI: <https://doi.org/10.4000/mediterranee.13340>

All rights reserved

Peril of the sea for the Mesolithic sites of Western France

Les sites mésolithiques de l'ouest de la France au péril de la mer

Grégor Marchand

UMR 6566 du CNRS – CREAAH – Laboratoire Archéosciences, Université de Rennes 1, Rennes, France
gregor.marchand@univ-rennes1.fr

Abstract: The archaeological remains of prehistoric maritime hunter-gatherer societies were mostly swept away or submerged by the rise of the ocean during the Holocene. The slowing down of this marine transgression in the middle of the 7th millennium cal BC allows us to access archaeological sites on a restricted stretch of coastline in southern Brittany. Thrilling anthropological perspectives then emerge concerning the land/sea economic networks of hunter-gatherers and the historical role of these coastal human communities especially during the neolithization. The threats to this coastal heritage are as natural as anthropogenic. This article then evokes several methods of archaeological intervention tested for about twenty years on the three main types of sites currently known: 1/ archaeological level protected by a dune such as Beg-er-Vil (Quiberon, Morbihan), 2/ dwelling in a rock-shelter as Roc'h Santeg Leton (Santec, Finistère), 3/ site at the top of the cliffs (everywhere). Very threatened by ocean rages, their exploration is conditioned by an inadequate legislative framework and by financial and logistical means well below the scientific and heritage stakes.

Keywords: Brittany, Loire-Atlantique, Mesolithic, Shell Midden, Dwelling, Rock-Shelter

Résumé : Les traces archéologiques des sociétés de chasseurs-cueilleurs maritimes de la Préhistoire ont pour la plupart été balayées ou submergées par la remontée des océans durant l'Holocène. Le ralentissement de cette transgression marine au milieu du 7e millénaire avant notre ère nous permet d'accéder à des sites archéologiques sur un segment de côte hélas restreint au sud de la Bretagne. Emergent alors de palpitantes perspectives anthropologiques concernant, le fonctionnement des réseaux économiques terre/mer des derniers chasseurs-cueilleurs de l'Holocène et le rôle historique de ces communautés humaines littorales, en particulier lors de la néolithisation. Les menaces qui pèsent sur ce patrimoine installé sur la frange côtière sont autant naturelles qu'anthropiques. Cet article évoque alors plusieurs modalités d'intervention archéologique testées depuis une vingtaine d'années sur les trois types principaux de sites actuellement connus : 1/ niveau archéologique protégé par une dune comme à Beg-er-Vil (Quiberon, Morbihan), 2/ habitat dans un abri-sous-roche comme à Roc'h Santeg Leton (Santec, Finistère), 3/ site au sommet des falaises (partout). Très menacés par les fureurs océaniques, leur exploration est conditionnée par un cadre législatif inadéquat et par des moyens financiers et logistiques bien en deçà des enjeux scientifiques et patrimoniaux.

Mots-clés : Bretagne, Loire-Atlantique, Mésolithique, amas coquillier, habitat, abri-sous-roche

I - Characteristics and implications of working on the Mesolithic on the coast

I.1 - A triple issue

The archaeological remains of the prehistoric maritime hunter-gatherer societies were mostly swept away or submerged by the rise of the oceans during the first half of Holocene. Between the final Palaeolithic and the Neolithic, this increase in level is estimated at 60 meters (Pirazzoli, 1991; Stephan and Goslin, 2014; Goslin *et al.*, 2015). The coastline moved back dozens of kilometres in the sandy low-lands of southwest and west-central France. On the rocky coasts of the Armorican Massif, the receding of the coastline was also important because the oceanic platform is relatively shallow. Many other settlements, albeit further back from the coast during prehistoric times, have been flooded or eroded by the sea. However the “surviving” settlements – and especially the shell middens – have been the main focus of attention in western France since the late 19th century, to the detriment of the more continental dwellings, whose sites are no longer considered as decisive as on the coast. A powerfully “romantic” vision of populations confronted with ocean fury probably accounts for this overestimation, but the excavations of the

necropolis of Tévéc and Hoedic during the 1930s have also contributed to this particular interest (Péquart *et al.*, 1937; Péquart and Péquart, 1954). Through the social complexity they seemed to reveal, they questioned the foundations of Neolithic societies, marked at the local scale by the megaliths of the Carnac region. The question of possible links between these archaeological phenomena was raised as early as the 1930s and in this geographical context, it would be difficult not to involve the ocean in the answer.

Working on the coast means also confronting extremely fierce erosions by the tides, the waves and the storms. These areas are in addition under very strong pressure by the real estate sector, especially for the building of homes that are only cyclically occupied with a peak during summer holidays. Port infrastructures or tourist facilities (benches, car parks, paths, stairs) represent tangible threats for coastal sites. The absence of preventive archaeology is evident in these places. Coastal archaeology also requires very specific techniques and methods compared to that of continental areas, with much higher costs to address geomorphologic dynamics on maritime and continental fields, the detection of submerged or foreshore sites, or the very particular excavation of shell middens.



Taking into account these specific problems, interventions on Mesolithic sites on the coastal strip must integrate three parallel issues:

- A functionalist (or processual) perspective: lifestyle of the marine hunter-gatherers, interaction between land and sea, mobility, use and role of islands
- An evolutionist perspective: what is the role in the history of these populations (social hierarchy, neolithization, emergence of megalithism, circulation by seafaring, coastal areas as places of relegation)?
- An heritage perspective: natural and anthropogenic erosion of Mesolithic settlement, intervention strategy, legal framework and intervention methods.

After exposing the very particular scientific importance of this maritime prehistory and its conceptual roots, this article wishes to present some technical solutions adopted for various practical cases of Mesolithic sites at risk of submergence on the French Atlantic coast.

1.2 - The maritime hunter-gatherers of Atlantic France in perspective

1.2.1 - Specific sites for specific populations?

Some populations of marine hunter-gatherers – to use the expression of D. Yesner (1980) – have developed very sophisticated systems for exploiting the coastal ecotone, based on collective capture and storage of abundant, predictable and cyclical resources. The control of these resources intervenes in the relations within hierarchical societies in particular among the peoples bordering the North Pacific (Testart, 1982; Fitzhugh, 2003; Sassaman, 2004; Kelly, 2007). The link between storage, sedentary life and social hierarchy cannot be established a priori, but appears as a stimulating hypothesis on which to work.

The knowledge about Mesolithic groups with a maritime economy in France is largely dependent on the four large shell middens of southern Brittany, Beg-



Fig. 1 – Location and types of Mesolithic sites mentioned in the text. Credit: CAD: G. Marchand



an-Dorchenn (Plomeur, Finistère), Téviec (Saint-Pierre-Quiberon), Port-Neuf (Hoedic, Morbihan) and Beg-er-Vil (Quiberon, Morbihan – fig. 1). They have been dated at the 6th millennium cal BC for the first three and at the end of the 7th for the last (Kayser 1992; Marchand 2014, p. 90). The shell layer of Saint-Gildas Ib (Préfaillies, Loire-Atlantique), which was unfortunately destroyed without sufficient scientific observations having been collected, can be mentioned as well (Dupont *et al.*, 2007). Besides the exceptional preservation of faunal remains (shellfishes, crabs, mammals, fishes, birds), these archaeological levels less acid than the surrounding lands are the only ones to have delivered heavy structures, like tombs under cairns in Téviec and Hoedic, paved areas in Beg-an-Dorchenn and Hoedic and hearths. When the excavation extended outside the shell layer, as at Beg-er-Vil since 2012, the habitat structures are also numerous, including a remarkable circular hut plan and several big hearths (Marchand *et al.*, 2018).

In all these sites there are also fireplaces of different types, while the levels around are strewn with rubble stones, ashes and charcoals. This preponderance of combustion activities goes well beyond the minimum caloric or food requirements of the human species and could be linked to specific food preparations. In the immediate future, there are no obvious storage structures or traces of specialized hunting or fishing: they cannot be considered as specialized logistics sites, but conversely as long-term residential dwellings. The detection of stone fish weirs on foreshores appears to be crucial to understand the maritime activities and the extent of prey harvesting in the environment. This research project is in full development in Western France and it requires substantial underwater detection resources, as well as an association with geomorphologists specialized in these environments (Langouët and Daire, 2009; Marchand, 2017; Gandois *et al.*, 2017).

These shell middens are part of a larger mesolithic network of coastal settlements, with by far the largest number of non-shell cliff top sites. There are no massive structures there at present, but excavations are still rare in these places and this is clearly an issue for future research.

1.2.2 - The island question

The question of the status of islands in Mesolithic cultural and economic systems must also be raised. Holocene island spaces are research objects with variable geometry. The rise of the oceans since the Late Glacial has indeed gradually flooded immense territories, the highest of them forming the current islands, the lowest having only a fleeting existence. It seems from an examination of bathymetry and marine sea-level curves both at the end of the 8th and the beginning of the 7th millennium that the main islands with mesolithic occupations known today were separated from the continent, as well as from Hoedic, Houat, Belle-île-en-Mer or Groix (fig. 1; Marchand, 2013). The Mesolithic sites subsequent to this geographical

chasms are numerous, the epitome being the necropolis of Hoedic (Péquart and Péquart, 1954). A permanent maritime mobility between the mainland and the islands is demonstrated by the strict identity of the material culture during the second Mesolithic: there is indeed no island specificity in raw-material, techniques or styles, contrary to what is known in larger islands such as Corsica (Lanfranchi, 1998) or Ireland (Woodman, 2016).

The interest of these island occupations for hunter-gatherer peoples can be questioned. These areas are poor, even destitute in mineral resources, but also in terrestrial mammals at the base of the diet on the continent. The first fact is linked to the geology, the second is related to the low resilience of these environments. The disappearance of a species due to overhunting is irremediable (there are no more deer or wild suidae on these islands). The interest of human settlement can stem from several factors: relays in navigation, hunting of seals or migratory or non-migratory seabirds, ritual spaces such as an island of the dead or a particular symbolic space. But, incidentally, isn't permanent territorial extension a tropism of the human species?

1.2.3 - What place in history for these maritime populations?

A phenomenon of encapsulation of certain maritime populations during the process of neolithisation in Europe is observed, from Denmark to Portugal (Marchand, 2014, 63-68). Everything happens as if the presence of firmly established maritime populations had delayed the transition to agro-pastoral economies throughout the 6th millennium, even the 5th millennium in Northern Europe. The hypothesis of land being unsuitable for agricultural practices does not hold true; it should perhaps be seen more as the presence of other people. They mastered a robust economy of predation combining marine and land cycles. Knowledge of the marine elements and coastal navigation cannot be acquired fast; this can help explain these resistance effects over several centuries.

It is logical to seek within these coastal populations the possible beginnings of some Early Neolithic aspects, whether in the transfer of knowledge about the environment and techniques, or in social organization. The search for traces of social complexity within Mesolithic societies is indeed a project that legitimately retained researchers in southern Brittany (Schulting, 1996; Marchand, 2014, 388-401). They could have explained or at least encouraged the development of social inequalities of which megalithism, or the diffusion of jadeite axes in the Middle Neolithic, are the most eloquent testimonies.

Digging Mesolithic sites on the coast is therefore an act underpinned by important and original problems for recent prehistory. Habitat or storage structures, fisheries on foreshores, or graves are all archaeological elements that feed them. Three excavations carried out on coastal sites will serve as examples of practical applications to these problems.





Fig. 2 – Beg-er-Vil (Quiberon, Morbihan). The Mesolithic shell layer is sandwiched between a Pleistocene beach and a dune. Photo: G. Marchand

2 - Digging and analysing a shell midden: the Beg-er-Vil project

The excavation of the Mesolithic site of Beg-er-Vil (Quiberon, Morbihan) illustrates the current standards of interventions on a coastal dwelling. From the beginning of the project in 2012, the layer of shells has been considered as only one part of the dwelling, with a logical extension of the excavation around it (Marchand *et al.*, 2018).

The unique archaeological level is clearly visible in the cliff as a single black-coloured level, filled with shells, crustacean remains, knapped flint, burnt rocky blocks and bones (fish, birds, mammals). This level lay between a Pleistocene beach and a 0.30 to 1.8 m thick dune that extends throughout this part of the Quiberon peninsula (fig. 2). The total estimated surface of the shell midden is about 130 m², but it is clearly impossible to estimate the surface removed by marine erosion. The Mesolithic occupation extends all around the shell level in a single silty-sandy level with a thickness of about 0.40 m. The area stripped by a backhoe measures 351 m², including 57 m² in the shell layer (as in June 2018). The extension of the excavation in its periphery could only be done in 2016 by eradicating a car park placed on dune sand (fig. 3). It should be noted that it is this urban status of the cadastral plot that has allowed the stripping of these formations; such opportunities are rare, especially since preventive operations cannot develop on this coastal strip, either formerly urbanized or protected by the 1986 coastal law.

The excavation protocol includes a trowel clearance of archaeological remains, with a tacheometer registering the objects longer than 20 mm and significant smaller objects (arrowheads, tools, bones). All sediments were sieved with 4 and 2 mm sieve meshes, first with sea water and then rinsed with fresh water. The laboratory sorting concerns the totality of the 4 mm sieve refusals and a sampling of the 2 mm mesh (extraction of all the non-shell elements and sorting of the shell remains on 10 g of sediments). Through its exhaustiveness, this operation offers a renewed vision of the diversity of resources exploited by these coastal populations.

Samples of raw sediment were taken per quarter square metre and per stratigraphic unit, to measure the variation in acidity levels in the horizontal and vertical dimensions, but also to have a reserve for geochemical analyses (X-ray fluorescence spectrometry). Geo-archaeological analysis, particularly by thin slides of the soil, is essential for understanding the functioning of these domestic areas, which are both areas of massive waste and areas of very trampled activity. This particular attention to taphonomic conditions precedes any spatial analyses.

We can describe now a Mesolithic dwelling with very varied domestic functions, with daily waste abandoned to the west of the site over a slight slope towards the ocean and a flatter zone to the east, where at least one circular hut was erected. A detailed understanding of these maritime adaptations will require further analysis in the coming years.





Fig. 3 – Beg-er-Vil (Quiberon, Morbihan). In 2017, the mechanical stripping of the dune (1.8 m thick) and of the overlying parking lot allows to explore the surroundings of the Mesolithic shell midden. At right on the photo is a pit-hearth in the centre of a circular hut. *Photo: G. Marchand*

3 - Digging on a rocky islet: the Roc'h Santeg Leton rock-shelter

The excavation of the rock-shelter of Roc'h Santeg Leton (Santec, Finistère) gives us the opportunity to operate in a different geomorphological context and from within another administrative framework. The site therefore belongs to the maritime domain and is managed by the “Department of underwater and underwater archaeological researches” (DRASSM) even if it is totally out of the sea. The rocky islet of Roc'h Santeg Leton is part of the group of islands and islets. Located 1,5 km from the mainland, it is only accessible by foot during very low tides or by boat, with no easy boarding area. Difficulty of access means that the site has not suffered from significant anthropogenic pressure and the stratigraphy is in a good state of conservation, but this constraint hinders access and monitoring of the regular erosion of archaeological remains due to different episodes of winter storms.

The site had been discovered and reported to the authorities by Daniel Roué, a volunteer prospector in 1985. As part of the ALERT project (Archeology, Coastal and Land Warming, direction: M.-Y. Daire), a visit to the site was carried out in 2014, which revealed its accelerated erosion by the storms. In march 2015, an excavation was conducted under the responsibility of P. Olmos Benlloch and G. Marchand. During two weeks in July 2016, a larger scale exploration was carried out with an average of seven people in the field. It allowed the complete recording of the remains of the Holocene. The site is at a level of 8 meters high (NGF) that is to say 3 meters above the highest tides. The preserved archaeological levels are on a platform framed by large rocks. The north block is a real rock-shelter,

partially collapsed, but the levels which it sheltered were washed away almost totally by the waves. Facing east, the main excavation area along the west block is 3 metres wide and 11 metres long. Its excavations covered approximately 19 m² (fig. 4).

The stone structures made of pebbles visible at the top of the sequence are very recent and linked to the hunt of seabirds. A large hearth dated of the Iron Age was underneath in a level of very indurated loess silt. Four successive artificial layers were excavated and sieved over a thickness of about 20 cm, with the first one containing Gallic shards, and for the next three, flints of the Early and Late Mesolithic, alas without strict sedimentary distinction. In the lower part of this holocene soil established on silts, a pit-hearth was dated by the radiocarbon at the beginning of the 5th millennium cal BC (Early Neolithic). A level of loess of about 40 cm thick covers the site and protects a sequence of the Middle Palaeolithic period. While the presence of Mousterian lithic pieces in the highest level remains tenuous, and will have to be discussed in subsequent excavations, they are very abundant in the two lower stratigraphic units. At this stage, it can be said that the most threatened archaeological levels have been excavated and recorded. There are no longer any holocene levels in situ or even disturbed, and a 40 to 50 cm layer of Pleistocene wind silt protects the levels of the middle Paleolithic that have been left in place (10 to 20 m²). Barring exceptional climatic events, these levels are therefore protected and can wait until a team of archaeologists is assembled to explore them, tomorrow or several years from now.





Fig. 4 – Roc'h Santeg Leton (Santec, Finistère), Western Block. The section is thick of 1 m with remains of Protohistory (Gallic) and Prehistory (Middle Paleolithic, Early Neolithic, Early and Late Mesolithic). *Photo: G. Marchand*

4 - So little knowledge on the numerous Mesolithic cliff top sites

The examples of Beg-er-Vil and Roc'h Santeg Leton concerned types of sites protected either by a dune or by the effect of large rocks. The majority of coastal Mesolithic sites do not benefit from such conditions and are much more degraded (fig. 5). Most of them were discovered on the path or on car parks along the coast by amateur or professional archaeologists. We also know that some of them may be found off the trails, totally upset by rabbit burrows or gull's nests. Men, animals and bad weather seem to combine their efforts to ensure an effective erasure of these Mesolithic sites known exclusively through the collection of flint from their sedimentary contexts.

In the Pays-de-la-Loire, it was Michel Tessier's surveys that gave rise to several test-pits carried out by the author of these article during the 1990s: Porteau-Est II and Porteau-Ouest (Pornic, Loire-Atlantique), Saint-Gildas 1a and Saint-Gildas 1b (Préfailles, Loire-Atlantique). The site of la Gilardière (Préfailles) is the only one to have been explored on a single area of 25 m² in 1995 (Marchand, 1999). A dispersion of lithic pieces was observed around a hearth area made of blocks of the substrate. The regular slope of the rock probably led to the remobilization of the lithic

pieces and the hearth (fig. 6). A radiocarbon dating gives as expected a position in the middle of the 6th millennium cal BC (Late Mesolithic locally known as Retzian).

These sites are all characterized by a single thin level, lying on the altered rock or directly on the rock and they did not benefit from a sufficient sedimentary cover. Other excavations need to be done to better understand them, in particular to look for functional signatures in the structures or the tools, in view of the paleo-economic problems described above.

5 - Beyond the alert

Three main types of Mesolithic sites by the Atlantic ocean have been presented in this article: 1/ protected by a dune such as Beg-er-Vil, 2/ in a rock-shelter as Roc'h Santeg Leton, 3/ at the top of the cliffs such as la Gilardière. All these operations are more complicated to realize than those on the continent, because of the climate, the insularity or the tides. This does not imply renouncing in any way the principles established for prehistoric excavations. The recording of the archaeological remains in the three spatial dimensions remains a basis, as well as the systematic sieving with sea water (or even with fresh





Fig. 5 – Le Gorzed (Groix, Morbihan). The widespread flint around the coastal path bears witness to the presence of a Late Mesolithic habitat (Discovery : A. Le Guen. Photo: G-A. Denat

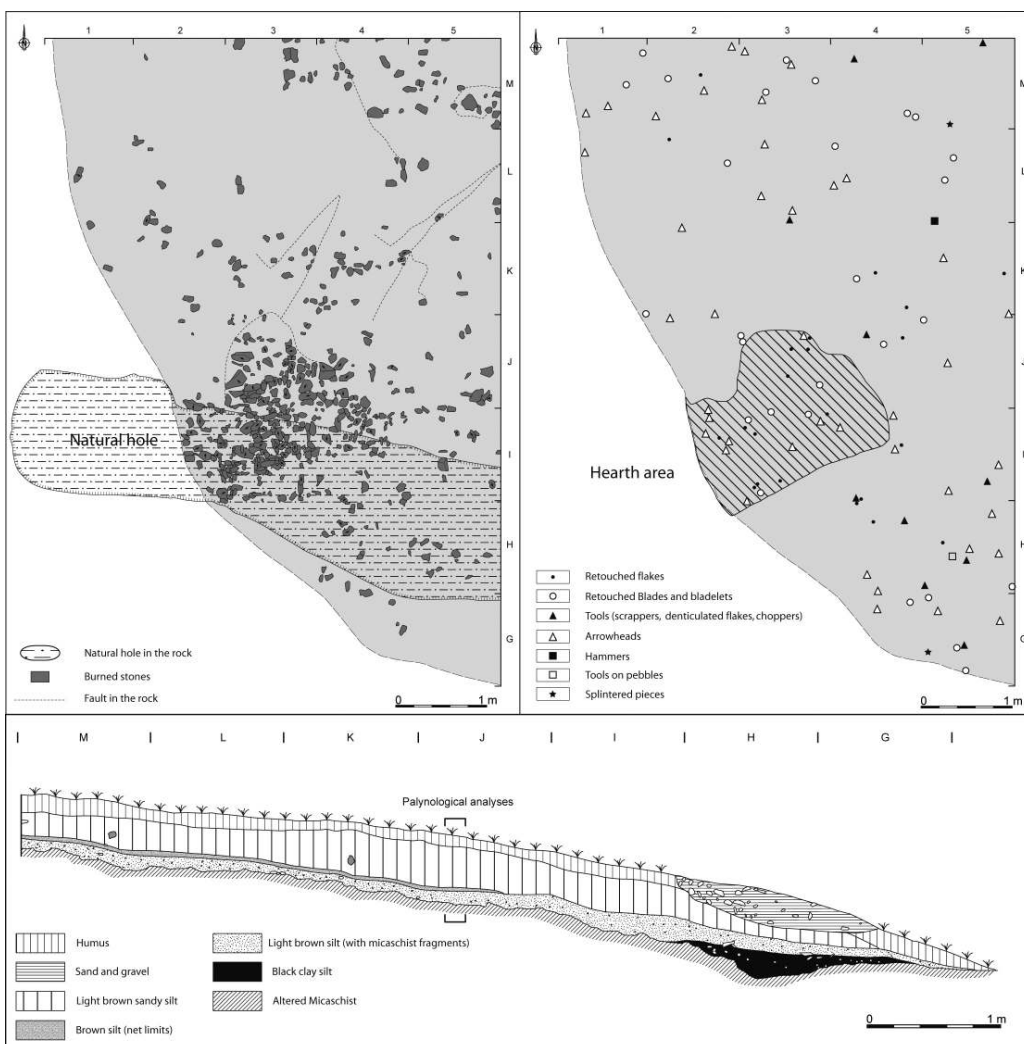


Fig. 6 – La Gilardière (Pornic, Loire-Atlantique). Hearth visible by burned stones (top left), tool distribution (top right) and stratigraphy (bottom). CAD: L. Quesnel, after Marchand 1999



water rinsing in Beg-er-Vil), with fine mesh (2 mm). This “classical” method remains a prerequisite for exploration of prehistoric sites. In Beg-er-Vil, we have added a mapping of geochemical elements and soil acidity variations in order to better control the aggressive effects of the environment near the ocean. The excavations are also based on a permanent dialogue with geo-archaeologists (for micromorphology in particular) and marine geomorphologists. It is indeed essential to master well this land-sea continuum so shifting over time.

The menaces to the cliff-top sites are clearly not sufficiently taken into account currently by the authorities and a whole heritage is now undergoing an accelerating degradation. The threats to most prehistoric coastal sites are still not being adequately assessed by archaeological heritage managers. Reports of discoveries by non-professional archaeologists have been a first level of alert for decades, necessary but hardly sufficient for global consideration. For several years, scholar programs have been trying to turn those raging screams of coastal heritage stakeholders into scientific material, such as the ALERT project in Brittany (Daire *et al.*, 2012) or the LITAQ project in Aquitaine (Verdin *et al.*, 2019). We must hope for

an improvement in the management of these “dispersed assets” (patrimoine diffus) in French according to P. Gouletquer’s perfectly fitting phrase) and an anticipation of its inevitable destruction. This will inevitably require additional financial resources for tidal interventions, but also cumbersome regulatory measures. For a site straddling the foreshore and the coast, the authorizations of the “Service régional de l’Archéologie”, of the DRASSM, of the “Conservatoire du Littoral”, sometimes of the manager of the Natura 2000 environmental management plan (“Préfecture départementale”) and of the commune (local council) concerned must generally be successively obtained. And curiously, ocean rages do not seem to have the same calendar...

The Atlantic Mesolithic was too closely linked to the exploration of the shell middens alone until the 1970s, leading to a subsequent rebalancing of work towards the continental Mesolithic, which was spurred on from the 1990s onwards by the development of preventive archaeology. It is time for the pendulum movement inherent in the world of ideas to return to the ocean, so that we can live up to the intellectual and heritage issues raised in this article.

References

- Daire, M.-Y., E. Lopez-Romero, J. N. Proust, H. Regnauld, S. Pian, and B. Shi. 2012. Coastal changes and cultural heritage: Towards an assessment of vulnerability through the Western France experience. *Journal of Island and Coastal archaeology* 7:168-182.
- Dupont, C., G. Marchand, Y. Gruet, and M. Tessier. 2007. Les occupations mésolithiques de la Pointe Saint-Gildas (Préfailles, Loire-Atlantique) dans leur cadre paléo-environnemental. *Gallia-Préhistoire* 49:161-196.
- Fitzhugh, B. 2003. *The evolution of complex Hunter-Gatherers. Archaeological evidence from the North Pacific*. New York: Springer Science/Business Media.
- Gandois, H., P. Stéphan, D. Cuisnier, O. Hulot, A. Ehrhold, M. Paul, N. Le Dantec, and M. Franzetti. 2017. The Stone Tidal Fish Weirs of the Molène Archipelago, Iroise Sea, Brittany, Western France: a long-term tradition with early megalithic origins. *The International Journal of Nautical Archaeology*, 47 (1):1-23.
- Goslin, J., B. Van Vliet Lanoe, G. Spada, S. Bradley, L. Tarasov, S. Neill, and S. Suanez. 2015. A new Holocene relative sealevel curve for western Brittany (France): Insights on isostatic dynamics along the Atlantic coasts of north-western Europe. *Quaternary Science Reviews* 129:341-365.
- Kayser, O. 1992. Les industries lithiques de la fin du Mésolithique en Armorique. In *Paysans et Bâisseurs. L'émergence du Néolithique atlantique et les origines du Mégalithisme, Actes du 17ème colloque interregional sur le Néolithique, Vannes, 29-31 octobre 1990*, ed. C. T. Le Roux C. T., vol. 5 (supplément) of *Revue Archéologique de l'Ouest*, 117-124.
- Kelly, R. 2007. *The foraging spectrum. Diversity in Hunter-Gatherer lifeways*, New York: Percheron Press.
- Lanfranchi, F. 1998. Préneolithique ou Mésolithique insulaire ? *Bulletin de la Société préhistorique française* 95 (4):537-546.
- Langouët, L., and M.-Y. Daire. 2009. Ancient maritime fish-traps of Brittany (France) : A reappraisal of the relationship between human and coastal environment during the Holocene. *Journal of Maritime Archaeology* 4 (2):105-123.
- Marchand, G. 1999. *La néolithisation de l'ouest de la France : caractérisation des industries lithiques*. British Archaeological Reports, International Series 748, Oxford: BAR Publishing.
- Marchand, G. 2013. Le Mésolithique insulaire atlantique : systèmes techniques et mobilité humaine à l'épreuve des bras de mer. In *Ancient maritime communities and the relationship between people and environments along the european atlantic coasts, Proceedings of the HOMER 2011 Conference, Vannes, 28 septembre-1^{er} octobre 2011*, British Archaeological Reports, International Series 2570, 359-369. Oxford: BAR Publishing.
- Marchand, G. 2014. *Préhistoire Atlantique. Fonctionnement et évolution des sociétés du Paléolithique au Néolithique*. Collection des Hespérides. Arles : Editions Errance.
- Marchand, G. 2017. Les murs de l'Atlantique : aux origines du phénomène mégalithique dans l'Ouest de la France. In *European Archaeology. Identities & Migrations. Hommages à Jean-Paul Demoule*, ed. L. Manolakis, N. Schlanger and A. Coudart, 387-408. Leiden: Sidestone Press.
- Marchand, G., C. Dupont, M. Laforge, J.-C. Le Bannier, C. Netter, D. Nukushina, M. Onfray, G. Querré, L. Quesnel, and P. Stéphan. 2018. Before the spatial analysis of Beg-er-Vil: A journey through the multiple archaeological dimensions of a Mesolithic dwelling in Atlantic France. *Journal of Archaeological Science, Reports* 18:973-983.
- Péquart, M., S.-J. Péquart, M. Boule, and H. Vallois. 1937. *Téviec, station nécropole mésolithique du Morbihan*. Archives de l'Institut de Paléontologie Humaine, mémoire 18, Paris.



- Péquart, M., and S.-J. Péquart. 1954. *Hoëdic. Deuxième station-nécropole du Mésolithique côtier armoricain*. Anvers: De Sikkel.
- Pirazzoli, P.A. 1991. *World atlas of Holocene sea level changes*. Vol. 58 of Oceanography Series, Amsterdam: Elsevier.
- Sassaman, K. E. 2004. Complex hunter-gatherers in evolution and history: a north-american perspective. *Journal of archaeological research* 12 (3):227-280.
- Schulting, R. J. 1996. Antlers, bone pins and flint blades: the Mesolithic cemeteries of Téviec and Hoëdic, Brittany. *Antiquity* 70:335-350.
- Stéphan, P., and J. Goslin. 2014. Holocene relative sea-level rise along the atlantic and English channel coasts of France: Reassessment of existing data using “Sea-level index points” method. *Quaternaire* 25 (4):295-312.
- Testart, A. 1982. *Les chasseurs-cueilleurs ou l'origine des inégalités*. Paris: Société d'Ethnographie.
- Verdin, F., F. Eynaud, P. Stéphan, G. Arnaud-Fassetta, M. Bosq, F. Bertrand, S. Suanez, C. Coutelier, F. Comte, S. Wagner, C. Belingrad, V. Ard, C. Manen, G. Saint-Sever, and G. Marchand. 2019. L'homme et son environnement sur le littoral médocain du Mésolithique à l'Antiquité. *Quaternaire* 30 (1):77-75.
- Woodman, P. 2016. Two case studies in the initial early holocen colonization in parts of Europe's Atlantic edges : it's not getting there that matters. In *Marine Ventures. Archaeological Perspectives on Human-Sea Relations*, ed. H. B. Bjerck, H. M. Breivik, S. E. Fretheim, E. L. Piana, B. Skar, A. M. Tivoli, and F. J. Zangrando, 105-122. Sheffield: Equinox Publishing.
- Yesner, D. 1980. Maritime Hunter-Gatherers: Ecology and Prehistory. *Current Anthropology*, 21 (6):727-750



