



The French dirks: Plougrescant and Beaune

Rolande Simon-Millot, Léonard Dumont

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LARGER THAN LIFE

The Ommerschans hoard and the
role of giant swords in the European
Bronze Age (1500-1100 BC)

edited by
L.W.S.W. Amkreutz and D.R. Fontijn



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David Fontijn visiting the Ommerschans hoard and Jutphaas dirk at the RMO
January 2023 (Rivka Fontijn).

Chapter 12

The French dirks: Plougrescant and Beaune

Rolande Simon-Millot and Léonard Dumont

12.1 Introduction

As in Great Britain and in the Netherlands, two ceremonial dirks belonging to the Plougrescant-Ommerschans type were found in France. Unlike the other finds, these French dirks were found hundreds of kilometres apart in circumstances that remain mostly unknown. They were also never properly published, but only appeared in short notices in books or articles from the end of the 19th or the beginning of the 20th century (e.g. Breuil 1900; Greenwell 1902; Mortillet and Mortillet 1881; Rey 1901 etc.).

Here, we intend to offer a review of the Plougrescant and Beaune ceremonial dirks, gathering the few known elements about their discovery, replacing these finds in their chronological and cultural context, describing them and finally presenting the analysis performed so far.

12.2 Plougrescant: background to a spectacular find

‘Enigmatic’, ‘prestigious’, ‘fascinating’ or simply ‘huge’ – those are the words commonly used to describe the Plougrescant-Ommerschans dirks. ‘Strange’, ‘rare’, sometimes even ‘unique’, that is how the Plougrescant dirk has been perceived since its discovery by the very first researchers who wrote about it (e.g. Gaultier du Mottay (cf. *infra*); Mortillet and Mortillet 1881). More so, because for a long time it was the only one known.

The dirk of Plougrescant is the first one of the six that was discovered. This happened in the 19th century, presumably in 1845. It is also the first one to have been exhibited in a museum, as early as 1874, under the title of ‘ceremonial dirk’. In our brief historical introduction, we follow the coining of this expression and its development until the publications of Jay Jordan Butler and Bakker in 1961 and Jacques Briard in 1965.

12.2.1 Find history and site context: a wet offering?

Considering the early date of discovery, not much is known of the find circumstances. As such, retracing the rather eventful history of this sword, from its discovery to its present location, is not really easy – although some archives proved to be helpful in this task.

The first mention of its discovery is to be found in a letter dated March 11th, 1866 written by Joachim Gaultier du Mottay,¹ a correspondent of the *Commission de Topographie des Gaules*, whose main objective was to verify Caesar's *Commentaries on the Gallic War* as practically and as scientifically as possible. Founded in July 1858 by decision of the Emperor Napoleon III, this commission was composed of a small group of academic members, both politicians and scientists, helped by a network of correspondents and scholarly societies. Their goal was to bring together material evidence of the French 'national past', and they were officially commissioned to draw maps and write dictionaries on the ancient topography of France. Officers, engineers, archivists, high school teachers, clergymen and other notables were thus mobilised to carry out research in their respective regions and to report this information to Paris, to the Ministry of Public Instruction (Jouys-Barbelin and Louboutin 2017). On this occasion, a lot of local correspondents criss-crossed their territory to find traces of the past; often they were told about the discoveries of ancient ruins or artefacts; sometimes beautiful objects were sent to the National Museum (Musée d'Archéologie Nationale Saint Germain-en-Laye) That is also what happened in the case of Plougrescant.

When Joachim Gaultier du Mottay heard about a 'Celtic' sword found in the village of Plougrescant near his little town of Plérin, he immediately wrote a letter to Alexandre Bertrand, instigator of the very young and not yet inaugurated French National Museum of Archaeology at Saint-Germain-en-Laye and an eminent member of the *Commission de Topographie des Gaules*:

"An ecclesiastic of my acquaintance is the holder of a dagger or sword (Gaulish no doubt) of considerable size – and size greater than those appeared in the last issue of the Revue – only the blade of which the form is presented here, is conserved.

As you can see, sir, this weapon is huge, I do not understand how it was handled conveniently. It was found in 1846 [this date would be corrected in a next letter; it seems the date of the discovery was 1845], in Plougrescant, district of Tréguier. The metal of which it is composed is clearer, a little more yellow than ordinary Roman bronze. Perhaps I could persuade the person whom it belongs to, to sell it to the museum in St-Germain. Be good enough to tell me whether to attempt this purchase; and how much to propose. This

1 Joachim Gaultier du Mottay was born in 1811 in Savenay (Loire-Atlantique) and died in 1883 in his castle of la Belle-Issue in Plérin (Brittany). He was a notable and had been mayor of Plérin in 1871. He participated in numerous publications of scientific societies from Brittany for which he wrote many historical records.

*blade is very heavy and weighs more than 2 kilograms, at least it seems to have that weight when it is held."*²
[translation by authors]

A little sketch of the sword accompanied this first letter (Fig. 12.1). In a letter dated to June 1867, Joachim Gaultier du Mottay was proud to inform the now director of the archaeological museum, Alexandre Bertrand, that he bought the Plougrescant dirk for the museum with the money of the *Commission de Topographie des Gaules*³:

*"Dear Sir, I have the pleasure to inform you that I am finally in possession, for the Museum of St-Germain, of the beautiful Gallic sword found in Plougrescant (canton Tréguier) a few years ago and here is a formless drawing. Unfortunately, the handle is missing, but despite this drawback, it is in a beautiful conservation, its patina is superb. It was, at the time of its discovery, in the company of three or four 'wedges' [possibly socketed axes], also in bronze, but whose form or exterior presented nothing particular. Since it has been in my hands, I am being urged to deposit it in one of the county's collections; but it's useless. It will go to the museum of St Germain; I paid for it, moreover, with the money of the Topography of the Gauls."*⁴ [translation by authors]

In this letter, Gaultier du Mottay referred to three or four socketed axes but nothing consolidates this hypothesis. Even Jacques Briard (1965, 91-92) contests the authenticity of the association: "...the antiquity of the discovery makes this association suspect, of which there is no proof." Finally, one month later, in a letter dated to July 24th in 1867, Joachim Gaultier du Mottay tells us more about the context of the discovery:

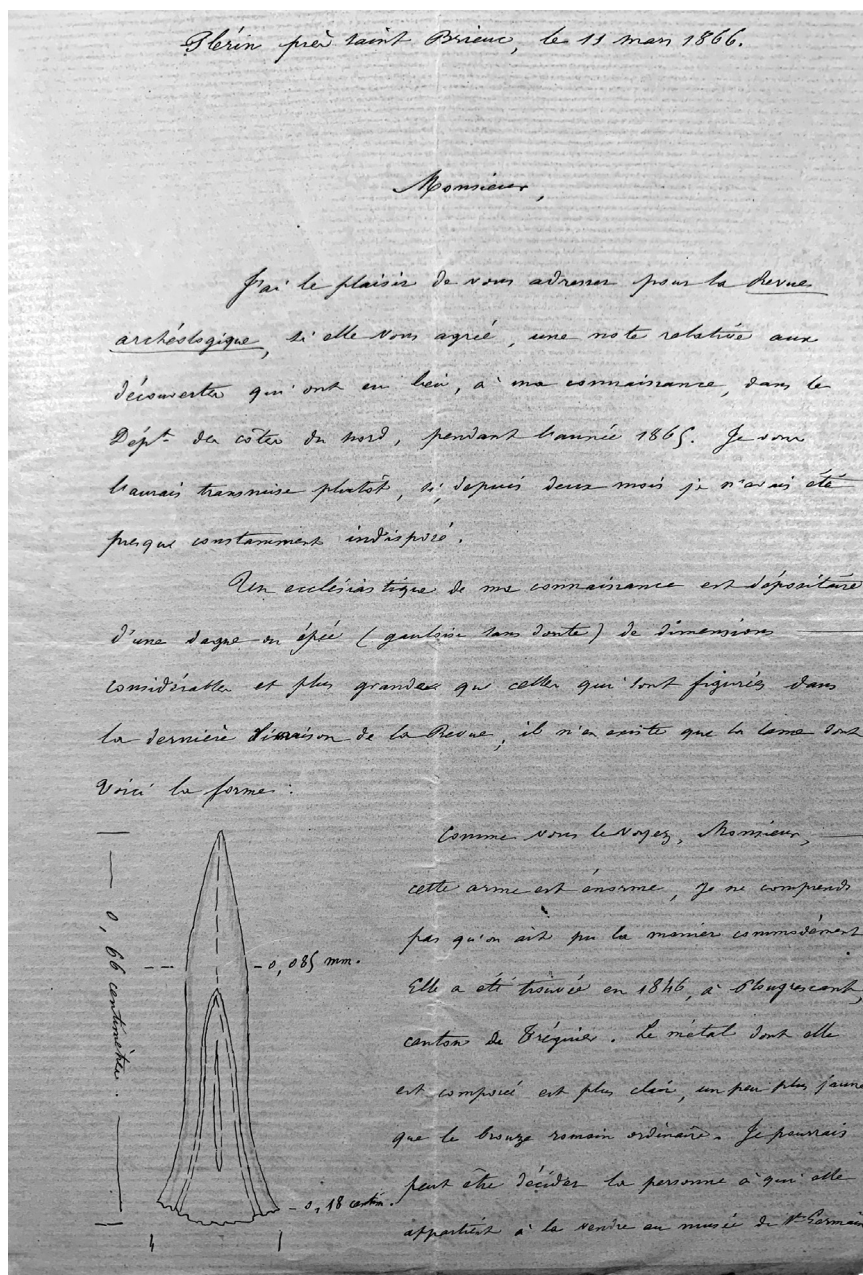
"Here is, in a few words, the story of the bronze blade that I have had the pleasure of handing over to Mr. Beaune
[who was the assistant director of the museum till his

2 Letter from Joachim Gauthier du Mottay dated March 11, 1866, addressed to Alexandre Bertrand mentioning for the first time the sword of Plougrescant. Credits: National Museum of Archaeology – National Domain of Saint-Germain-en-Laye – Archives Centre. Old correspondence collection. Gaultier du Mottay file.

3 Thanks to a receipt kept in the Museum archives, we know for the records that the dirk has been purchased by the Museum of Saint-Germain, for "the sum of seventy-five francs". Letter from Joachim Gauthier du Mottay dated June 17, 1869, addressed to Alexandre Bertrand. Credits: National Museum of Archaeology – National Domain of Saint-Germain-en-Laye – Archives Centre. Old correspondence collection. Gaultier du Mottay file.

4 Letter from Joachim Gauthier du Mottay dated June 4, 1867, addressed to Alexandre Bertrand mentioning the acquisition of the sword of Plougrescant. Credits: National Museum of Archaeology – National Domain of Saint-Germain-en-Laye – Archives Centre. Old correspondence collection. Gaultier du Mottay file.

Figure 12.1: Extract of du Mottay's 1866 letter to Alexandre Bertrand with a drawing of the Plougrescant dirk (Musée d'archéologie nationale – Domaine national de Saint-Germain-en-Laye – Centre des archives).



death, a few months later, in December of 1867]. It was found in 1845, in the municipality of Plougrescant, in the district of Tréguier, by a farmer who was ploughing the property of the late Mr. Cavan, then advisor to the royal court of Rennes. It was accompanied by four hollow bronze 'wedges' (one of which was recently added to the museum of Saint-Brieuc) and was purchased by Mr. Toussaint, landowner in Lannion. Three years later, in 1848, it entered the collection of Mr. de Penguern, judge in Lannion and distinguished archaeologist. When Mr. de Penguern died in 1857, the antiquities that formed his museum were packed and unpacked several times, before eventually being relegated to an attic in Morlaix.

There, through a cleric of my acquaintance interested in archaeology – [l'abbé Daniel] – I was able to get it out not without difficulty. I have been told that one of the four bronze axes found with the blade was still in the hands of a farmer of Plougrescant, and I will try to procure it for myself.”⁵ [translation by authors]

5 Letter from Joachim Gauthier du Mottay dated July 24, 1867, addressed to Alexandre Bertrand mentioning the discovery of the sword of Plougrescant. Credits: National Museum of Archeology – National Domain of Saint-Germain-en-Laye – Archives Centre. Old correspondence collection. Gaultier du Mottay file.

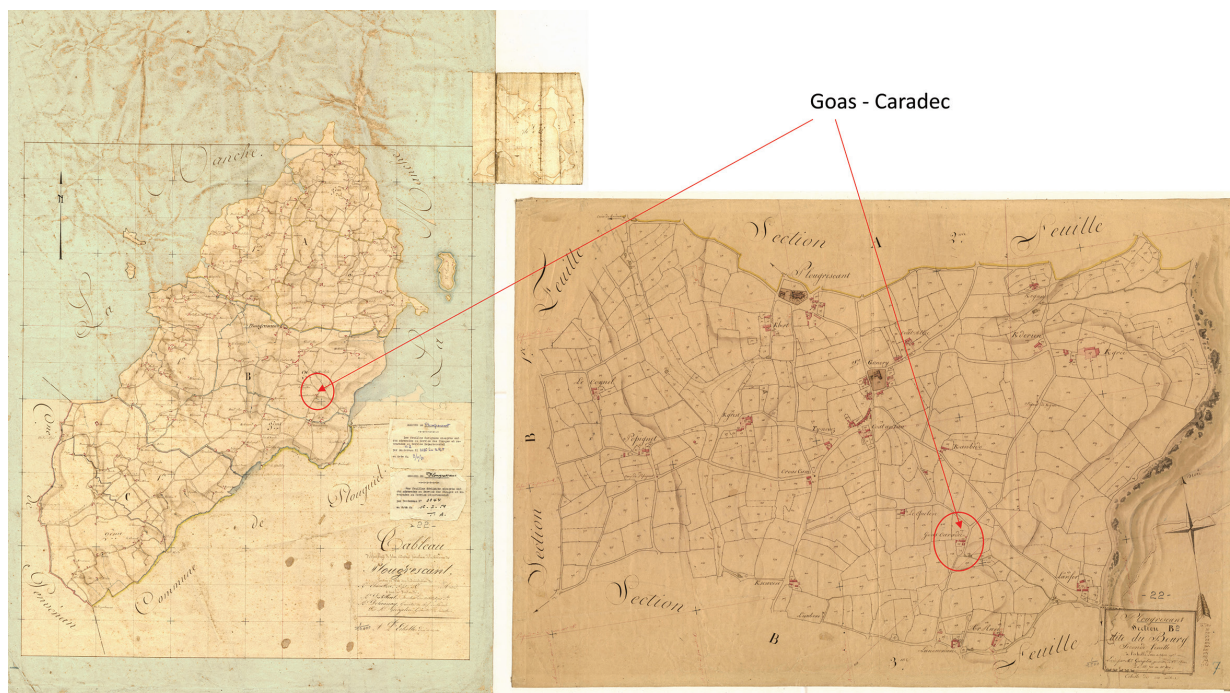


Figure 12.2: Extract of the cadastral plan of Plougrescant highlighting the location of Goas Caradec (Archives départementales des Côtes-d'Armor).

As explained by du Mottay, the years following the find were quite tumultuous: in 1845, the dirk is discovered by a farmer on a property owned by someone called Cavan. The dirk was rapidly sold to a man from Lannion, near Plougrescant. Three years later, in 1848, the sword is sold again to a collector named M. de Penguern, who died in 1857. After that, the dirk was relegated and finally bought by Joachim Gaultier du Mottay with the help of a cleric, *l'Abbé Daniel*, for the benefit of the *Musée de Saint-Germain-en-Laye* in 1867. The letter from July 1867 is the only piece of archival data that gives us some information about the context, the location and the recent biography of the dirk. Until now, Joachim Gaultier du Mottay is our only source of information and we are forced to believe him, although Jacques Briard proposed not to take the association of the dirk and the four socketed axes for granted. In the absence of proof, we also think that this association is highly improbable because of the very late chronology of the socketed axes and the lack of any known context.

Another element appears to be – at least – partially false. The judge Cavan mentioned by Gaultier du Mottay did not own any ground near the village of Plougrescant. Our genealogical search for the name Cavan in Plougrescant only leads to Madame Françoise Cavan, who died in Plougrescant in 1877. She was also designated as widow of Yves Omnès, a blacksmith deceased in 1844, only one year before the discovery of the dirk. This may explain the

confusion about the 'late Cavan', who was not the well-known judge Cavan 'advisor to the royal court of Rennes' but only the 'widow Cavan' who owned a little piece of land in Plougrescant, at a place named Goas Caradec (Fig. 12.2). This location is quite interesting as it is situated near a spring and not far from the sea. The actual place of Goas Caradec is still cultivated. An old wash house stands on the grounds. Mr. Marc Ponsonnet, the local historian who helped us find some clues about Cavan in Plougrescant, is not aware of recent archaeological finds. As there is no urban development in this rural area, no excavation was conducted by archaeologists in the recent past. The local archaeological service only pointed out one other Bronze Age site in the municipality of Plougrescant: a tumulus, that was excavated in October of 1822 at 'Ar-Run', with no more traces than "*some fragments of pottery and small pieces of highly oxidized bronze*", now lost (Le Maire 2017). This destroyed tumulus could be localised at the south of Goas-Caradec, near the presumed site of discovery of the dirk. It can be dated to the end of the Early Bronze Age or the beginning of the Middle Bronze Age, and it could have been contemporary to the dirk.

The landscape around Plougrescant is quite astonishing and could fit in the concept of 'strange places' developed by Richard Bradley (2017): it is a wild and steep coast of granite blocks, very striking and desolate (Fig. 12.3). The territory of Plougrescant as such is a land stretching towards the sea. Jutting outward, the inland part is crossed by numerous little



Figure 12.3: A Plougrescant landscape on the sea shore (R. Simon-Millot).

rivers, bogs, fountains and springs. The potential find spot, Goas Caradec, seems almost friendly in this context. Notable is the presence in the field of a spring, very propitious to offerings of bronzes. The proximity of the Bronze Age tumulus previously mentioned must also be taken into account. A spring, a deposition site and a tumulus are probably not sufficient elements to evoke a ritual landscape, but enough for us to assume its possible existence.

12.2.2 The first publications: the emergence of a concept

The Plougrescant sword entered the collection of the archaeological museum of Saint-Germain-en-Laye under the number 7600. When Gabriel de Mortillet published the first catalogue of the museum in 1869, he did not mention the Plougrescant dirk. Maybe it was not exhibited or did not seem so important to him. In 1874, Salomon Reinach, assistant of Alexandre Bertrand, director of the Museum, published a new catalogue and this time presented the dirk in the Bronze Age section: “*At the right (7600), an exceptional type by its size and shape, found in Plougrescant (Côte du Nord); it is undoubtedly a sacrificial dagger or a religious offering*” (Reinach 1874, 144). By then the dirk was exhibited with other swords, originals and copies (Fig. 12.4).

A few years later, in 1881, Gabriel de Mortillet, now in charge of the Prehistoric collections at the National Archaeological Museum, published *Le musée préhistorique* in which he classified the Plougrescant dirk into the ‘Morgian Period’, anterior to the ‘Larnaudian period’. He was the first one to really study the blade and he noticed the particular edges of it, cast with a bevelled shape and not hammered:

“Broad, thick and heavy sword blade, or rather gigantic triangular dagger blade, with reliefs in the middle as a blade of smaller size. Base convex, but without trace of rivets. Molded edges but as if they had been hammered to be sharpened. Weight: 2 kilos 180 grams. Plougrescant

(Côtes du Nord). Collected by Gaultier du Mottay. (Museum of Saint-Germain en Laye, n° 7600).” [translation by authors] (Mortillet and Mortillet 1881, pl. 69)

This publication of Mortillet inspired Victor Micault, an important Breton archaeologist who published the discovery of seven swords in Saint-Brandan in 1881. As early as 1882, Victor Micault (1882, 64) drew a parallel between the Plougrescant dirk and the Saint-Brandan swords:

“The swords of this type are not uncommon. I will mention several examples. At first the enormous blade found at Plougrescant, a unique piece in the world, which M. Gaultier du Mottay generously yielded to the Museum of St-Germain.” [translation by authors]

A beautiful drawing, unhappily not dated, in which the Plougrescant dirk is closely associated with the Saint-Brandan sword, was made, probably some years later, by Abel Maître, the workshop manager of the National Archaeological museum, who was well-informed of the last discoveries and of the recent publications (Fig. 12.5).

In 1883, when Victor Micault (1883, 78) published a compilation article about the swords and the daggers of Brittany, he again quoted Gabriel de Mortillet and described the Plougrescant dirk as “*a unique piece that obviously cannot be a common weapon. M. de Mortillet regards it as a simulacrum, a ritual object*”. After Mortillet and Micault, new developments concerning the Plougrescant sword only came decades later. In 1961 and 1965 the publications of Jay Butler and Jan-Albert Bakker and Jacques Briard renewed the research about the sword of Plougrescant. They laid the framework for the study of the Middle Bronze Age Tréboul-St-Brandan group, in which they incorporated the extraordinary or stranger blades of the ceremonial dirks of Plougrescant, Beaune or Ommerschans (Briard 1965, 91). A new era was beginning. Plougrescant was not alone anymore.



Figure 12.4: Antiquarian showcase of the French National Archaeological Museum in Saint-Germain-en-Laye in which (in the upper right corner) the Plougrescant dirk was exhibited (Musée d'archéologie nationale – Domaine national de Saint-Germain-en-Laye – Centre des archives).

12.2.3 Chronological and cultural context

Dating the Plougrescant find without any information about the context of its discovery nor any associated objects is a difficult task. A first attempt to date this find relies on stylistic considerations. Unfortunately, the butt end of the Plougrescant dirk is not well preserved and its original shape cannot be precisely identified. By comparison with the other ceremonial dirks, this part probably had a trapezoidal shape which finds very good parallels in Burgess and Gerloff's (1988, 46-61) 'group III' dirks, related to the Taunton phase from the end of British Middle Bronze

Age (14th century BC; Needham 1990, 249). The features of the Plougrescant blade, however, are also clearly related to the Tréboul-St-Brandan swords, named after the two eponymous finds from Brittany (Briard 1965, 86-94). These weapons are indeed decorated with groups of grooves on each side of the blade running from the hilt to the end of the second third of the blade (Fig. 12.5). On the Ommerschans-Plougrescant dirks, these grooves are replaced by relief strips with the same layout. The tip of Tréboul blades usually represents a diamond-shaped section forming an edge on each side which is imitated on the Ommerschans-

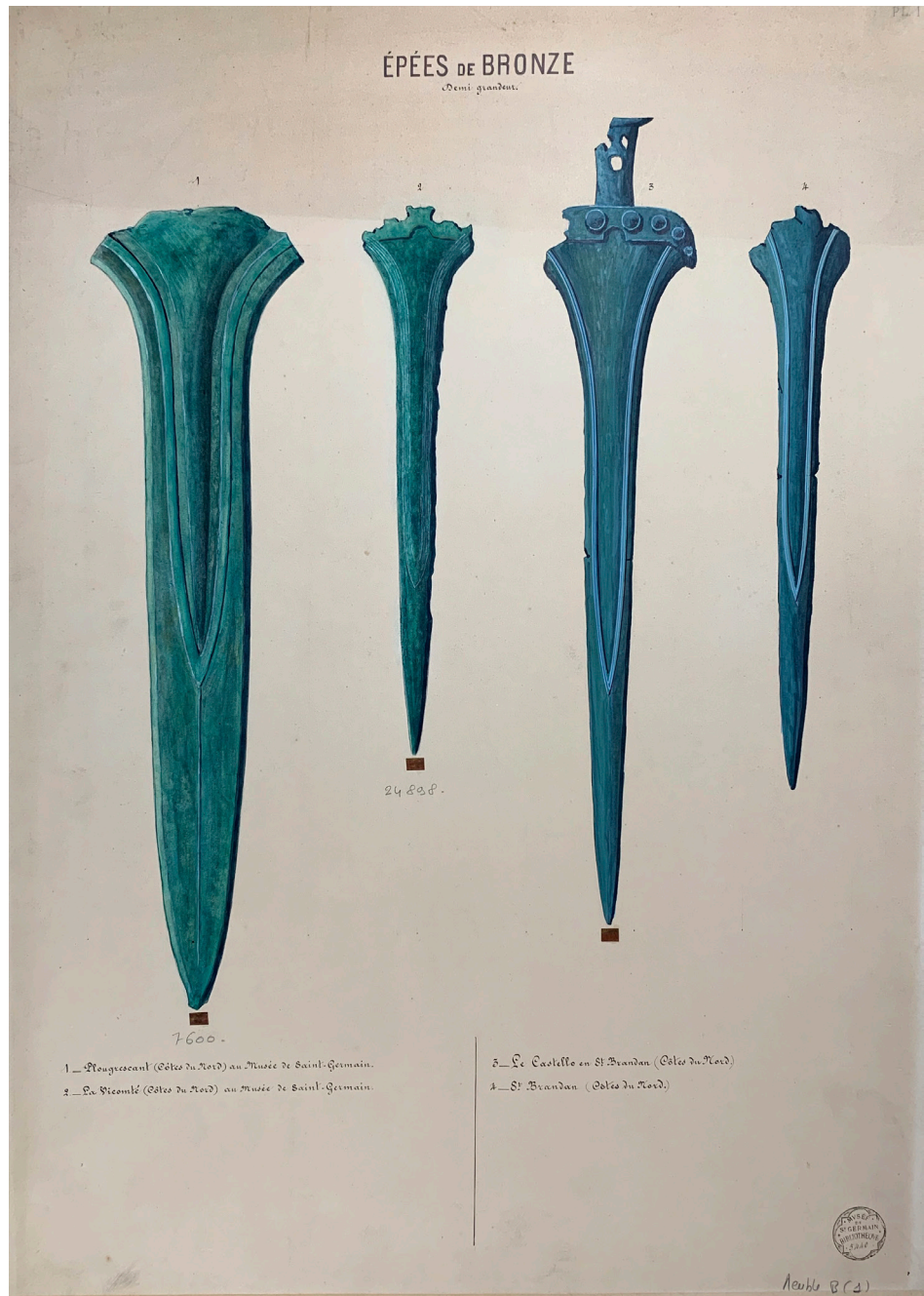


Figure 12.5: Abel Maitre's watercolour plate depicting the Plougrescant dirk and some of the Saint-Brandan swords (Musée d'archéologie nationale – Domaine national de Saint-Germain-en-Laye – Centre des archives).

Plougrescant type swords with a thin rib. The cross-section of the upper part of these blades can also be compared to Tréboul swords found in Brittany, with a flat section around the cutting edge and a central bulge. These typical weapons of the 'Tréboul group' are generally placed earlier in time than the rapiers with a trapezoidal butt figuring in the Breton Middle Bronze Age chronology, in the first half of the period between 1700 and 1500 BC (Fig. 12.6). This dating relies on typological considerations but also on a ^{14}C date on a linen fabric from the Tréboul hoard, which dates the find between 1727 and 1476 BC (Gabillot 2003, 4).

A much later date in the middle of the Late Bronze Age (Ha A2) was proposed based on the Kimberley and Beaune dirk's *ricasso*, a blunt part of the blade below the hilt (Butler and Bakker 1961, 205). This typical Late Bronze Age feature (Cowen 1955, 64) actually does not exist on the ceremonial dirks. The upper part of the Beaune sword was reconstructed recently (see below) and the Kimberley dirk's *ricasso* simply consists of damages on the cutting edges at the base of the blade (Needham 1990, 244). Butler and Bakker also considered the chisels and the Sicilian razor from the Ommerschans hoard as clues for a dating in the beginning or the middle

Types

- Tréboul–Saint–Brandan dirks and daggers
- Tréboul–like dirks and daggers
- ▲ Plougrescant–Ommerschans dirks
- ▼ Kimberley dirks
- Caistor St Edmunds–Melle dirks

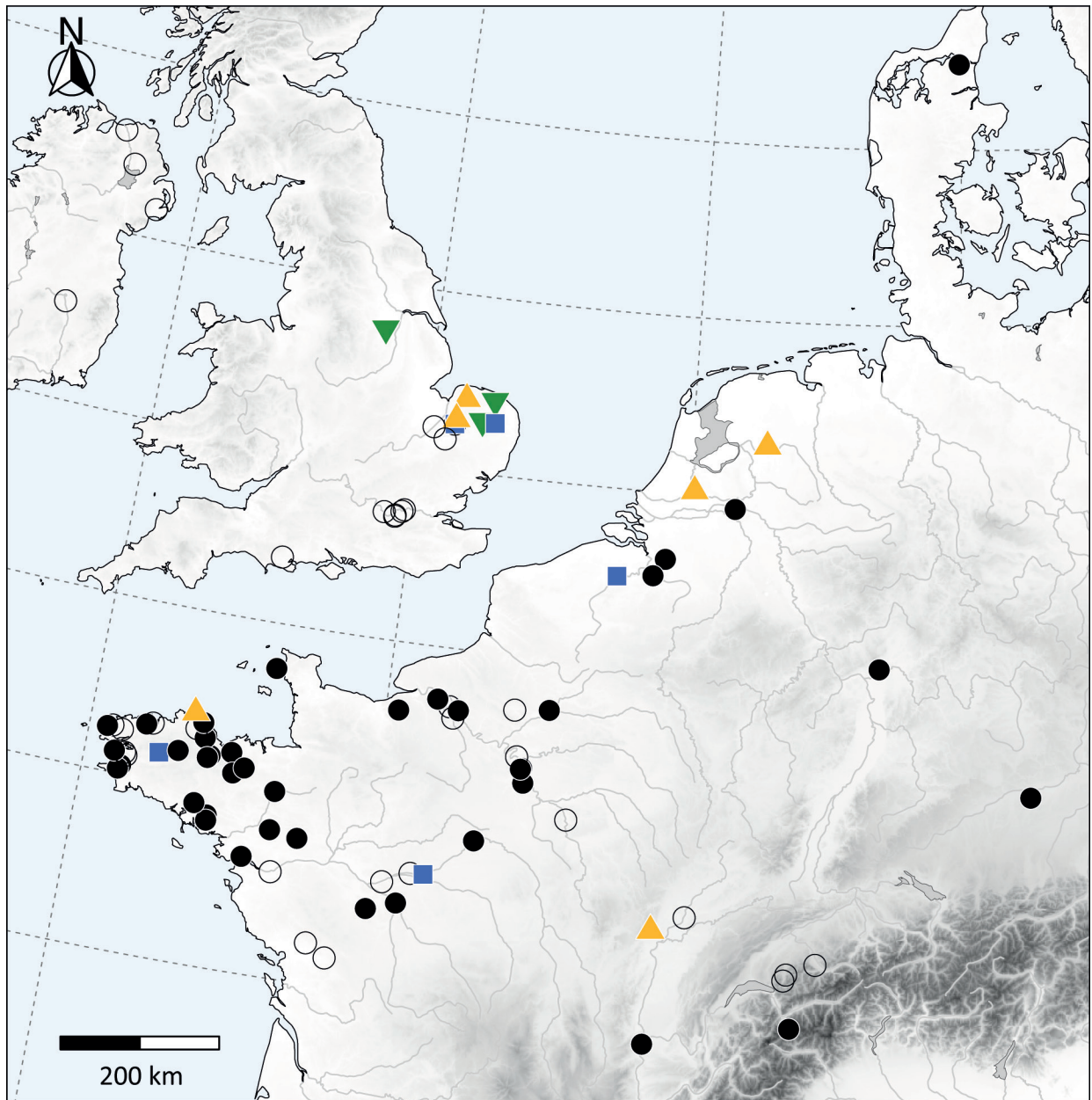


Figure 12.7: Distribution map of the Tréboul–St–Brandan rapiers and daggers, as well as the ceremonial dirks discussed in this book. Data: Bastien and Yvard 1977; Blanchet 1984; Blanchet and Lambot 1977; Broholm 1935; Briard 1966; Burgess and Gerloff 1988; Butler and Bakker 1961; Chopin and Gomez de Soto 2014; Cordier 2009; Gabillot 2003; Gallay 1988; Lebrasseur 1994; Le Roux 1975; Mohen 1977; Needham 1990; Schauer 1971; 1984; Warmenbol 1986b; Warmenbol *et al.* 1992 (L. Dumont and R. Simon-Millot).



Figure 12.8: The Plougrescant ceremonial dirk (photo: RMO; drawing: L. Dumont).

northern Europe and the western Alps. This distribution in different directions where other ceremonial dirks were found indicates that connections may have existed between these areas in the Middle Bronze Age.

12.2.5 Brittany and Middle Bronze Age connections

Strong connections between Brittany and the other side of the Channel already existed in the Early Bronze Age, with similarities in the material culture between the Wessex and Armorican Tumulus cultures (Briard 1965, 77; 1984, 198-201; 1987). These relations still exist in the Middle Bronze Age. The dirks and rapiers with a trapezoidal butt are probably the best witnesses of the continuity of these cross-Channel exchanges. They are commonly described as 'British rapiers' (Burgess and Gerloff 1988, 50; Warmenbol 1986a). Several of them were found in Brittany (Briard 1965, 97-98), in northern France (Breuil 1900, 506)

or in the Paris Basin (Mohen 1977, 77-78). Their British origin is commonly accepted (Briard 1965, 100), and the discovery of several stone moulds for the production of these dirks in England and in Ireland (Burgess and Gerloff 1988, 116) testifies to their production on that side of the Channel.

There are also analogies between the Tréboul group and Northwest Europe. A sword belonging to the Wohlde type was found in 1877 in a hoard from La Vicomté-sur-Rance (Briard 1965, 89). It has good parallels in swords found in Lower Saxony (Laux 2009, 28-33). Weapons from the same time were also found in the Benelux, such as in Huy near Liège; (Warmenbol 1995, 66), Zwiijndrecht, close to Antwerp (Mariën 1952, 191) and Overloon in Dutch North Brabant (Fontijn 2002, 92). On the other hand, some Atlantic dirks from the Tréboul group also come from Belgium (Fig. 12.7; Warmenbol 1986b; Warmenbol *et al.* 1992, 83). In the Netherlands also several Tréboul

spearheads were documented (Butler 1987, 10). There are therefore many material witnesses of connections between this area and Brittany in the Middle Bronze Age.

The link between Brittany, England and the Benelux observed with the distribution of the ceremonial dirks then seems confirmed by the study of other kinds of artefacts. However, these relations with the Atlantic area, the Channel and the North Sea are not so obvious, when considered from eastern France. The location of the Beaune dirk is therefore more surprising and is discussed further below.

12.3 Description of the Plougrescant dirk

The ceremonial dirk found in Plougrescant (Fig. 12.8) measures 66.5 centimetres in length and has a maximum width of 17.8 centimetres at the butt and a thickness varying between 8 and 9 millimetres. It weighs 2.2 kilograms. The upper part of the dirk, where a hilt would be fixed if it were a fully functional weapon, is called the tang or the butt. It is an important typological feature which is damaged here and it is unfortunately not possible to determine its original shape. By comparison with the other dirks of this kind, it may have been trapezoidal, inspired by the British rapiers, but we cannot exclude the possibility that it was round and more close to the Tréboul dirk butt. The fact that no rivet holes were drilled is certain, confirming the non-functional nature of the object.

On the blade, we can first notice that the cutting edges are non-functional as well. These are actually simple bevelled edges imitating functional blades whose sides can be hammered to harden the bronze. On the upper two thirds, the blade's body consists of a flat area with relief strips on each side of the central bulge. The bottom third presents a flat section with a thin ridge in the centre imitating the central edge visible on some Tréboul dirks and daggers (Fig. 12.5). The two faces are slightly asymmetrical: this ridge is a bit higher on one side than the other. It is also fading while it gets closer to the tip of the blade, and appears not to be as well formed as in the case of the Ommerschans dirk. It remains difficult to say if this a casting flaw that was not corrected or if it is due to the corrosion that formed after the artefact was deposited.

Overall the Plougrescant dirk is not in a very good state compared to the Dutch or British finds. Corrosion has formed depressions almost all over the surface (Fig. 12.9, 1) and seems to have developed quite deep into the bronze (see X-ray below, Fig. 12.11). This could correspond to a deposition in a very acidic environment, which is the case with the granitic Breton soil. Nevertheless, it is still possible to detect a few markings on the surface in some spots where the corrosion is not too intense. Some of them, which consist, of a small series of parallel traces, visible on the edges (Fig. 12.9, 2-3), could correspond to the finishing of the dirk, comprising of sanding the surface to remove marks that occurred during casting. Some larger scars cutting

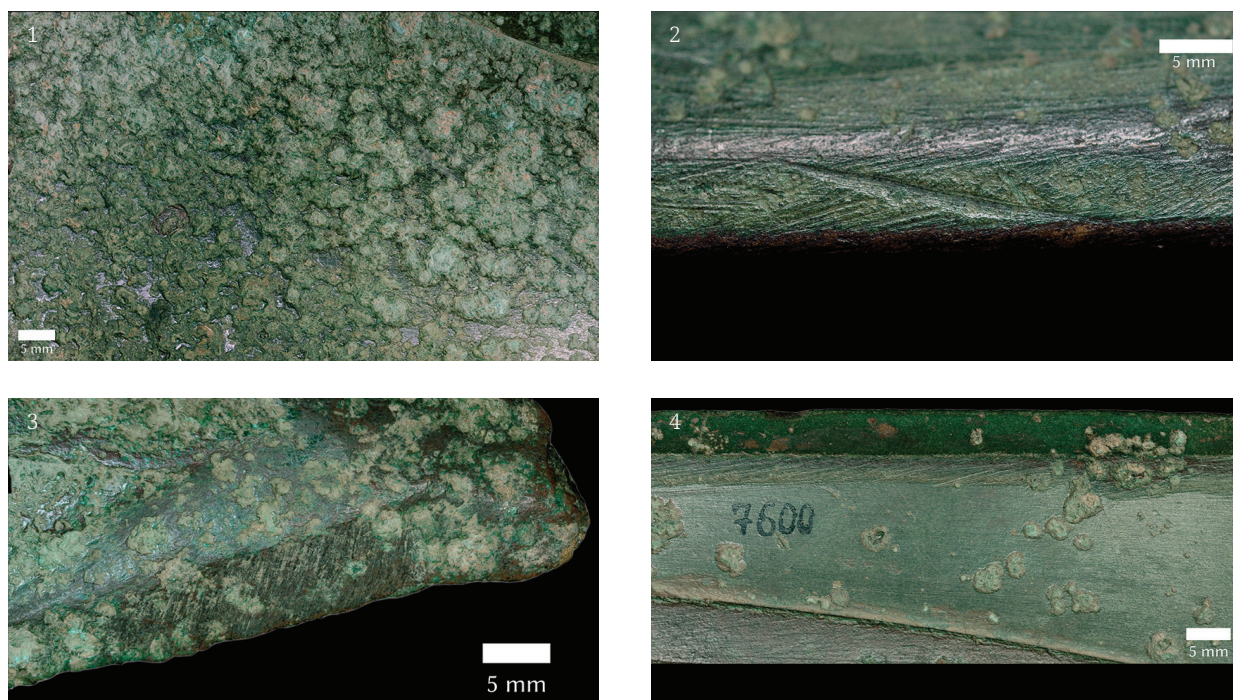


Figure 12.9: Details of the Plougrescant dirk: (1) Corrosion on the butt; (2) Marks on the edge; (3) Marks on the tip; (4) Smooth area on the edge (L. Dumont).

Dirk	Jutphaas		Ox-borough		Beaune hilt		Beaune mid/tip		Ploug- rescant	Rudham
%	XRF RCE	NRCA	ICP	XRF RCE	ICP	XRF RCE	ICP	XRF RCE	XRF RCE	
Cu	84	86	86	83	82	77	85	63	75	84
Sn	14	14	14	15	5.0	7.4	14	35	23	15
Pb	0.13	<0.5	0.15	0.11	3.9	2.8	0.14	0.44	0.33	0.15
Zn	<0.06	0.11	<	0.24	7.6	10	<0.01	0.17	0.08	0.09
As	0.31	0.30	0.36	0.34	0.27	0.29	0.22	0.57	0.43	0.32

Table 12.1: Results of the analyses made on five of the ceremonial dirks (Van Os and Theunissen 2016, 12).

through these marks (Fig. 12.9, 2) occurred afterwards and possibly are the result of ploughing, which is how the sword was found. Finally, some areas are perfectly smooth (Fig. 12.9, 4), demonstrating that the finishing process was completed, at least on some parts of the object.

12.3.1 Additional analysis: X-ray fluorescence

The composition of the sword was analysed by X-ray fluorescence (XRF) using a Niton XL3t GOLDD XRF analyser (Van Os and Theunissen 2016). The result shows a bronze composed of 75% copper and 23% of tin with traces of lead, zinc, arsenic and nickel below 1% (Table 12.1). Interpretations based on this analysis, however, should be made carefully and take into account the limits of this method. XRF is indeed a non-invasive technique which is used for surface analysis. In the case of copper based artefacts, the corrosion is then analysed and not the original metal, which does not give a good estimation of the original alloy composition. There is an important loss of copper in this outer layer compared to the metal which craftsmen used making the dirk

The comparison of the analyses made on the bottom part of the Beaune sword using Inductively Coupled Plasma spectrometry (ICP), with samples of non-corroded metal taken from the core of the object and XRF gives a good idea of the differences in composition recorded by these two techniques – with a 20% difference in the copper and tin levels.

It is then difficult to use the XRF results to compare the Plougrescant dirk with the other in terms of composition. Each of them was indeed abandoned in a specific context, resulting in different types of corrosion and different surface compositions. ICP analysis with samples coming from the centre of the sword would be the only way to get as close as possible to the bronze composition.

12.3.2 Additional analysis: radiograph

Additionally, an X-ray of the Plougrescant dirk was recently performed by the *Centre de recherche et de restauration des musées de France* (C2RMF), revealing the inner structure of the bronze. The goal was to compare this dirk with the Ommerschans sword in terms of porosity so that we could have an idea of the quality of the casting, but also to see whether the porosity was concentrated in some parts, which could have helped us in identifying the pouring funnel of the mould used to cast these objects and therewith the direction of casting (Mödlinger 2011, 33).

The result (Fig. 12.10) shows the very heterogeneous inner structure of the object, which contrasts with the radiograph of the dirk from Ommerschans (Chapter 6). The distinct porosity of the Plougrescant dirk was first interpreted as a result of poorly executed casting. However, a comparison of the corrosion ‘craters’ visible on the surface and the porosity spots revealed by the X-rays indicates that both are a perfect match. The porosity probably corresponds to a deep development of corrosion in the bronze. The X-ray absorption of these corroded areas is lower than normal bronze, which results in regions on the radiograph with a higher exposure. This unfortunately makes the interpretation of this dirk in terms of casting quality impossible, since there is no way to distinguish between the porosity due to the corrosion or gas trapped in the metal during casting.

12.4 Beaune: find history and a lack of evidence

The second French dirk of the Plougrescant-Ommerschans type was presumably found several hundred kilometres east from the other, near Beaune (Côte-d’Or), a small city located at the transition between the Saône plain and the *Côte de Beaune*, a hillier landscape. It is now conserved in the British Museum with the inventory number *WG.2257*. We know even less about the discovery of the Beaune

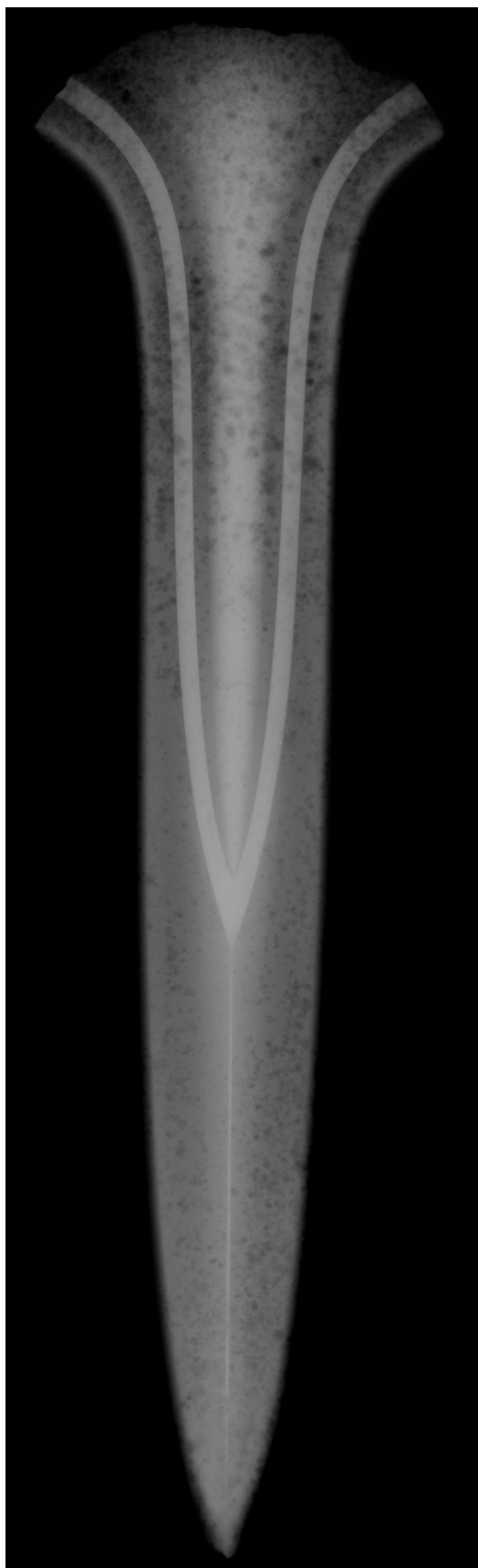


Figure 12.10:
Radiograph (left) of the
Plougrescant dirk (right)
(150 kV, 4 mA, 9 min
exposure with a 2mm
Cu filter)(C2RMF).

dirk than about the one coming from Plougrescant. The only indication about the location of the find comes from Reverend William Greenwell. It was probably bought at the end of the 19th century by Greenwell from Eugène Boban, a French art and antiquities dealer, mostly known for the sale of pre-Columbian Mesoamerican artefacts and the production of archaeological copies for educational purposes. No clue about the Beaune dirk was found in the Boban archives in the *Musée du Quai Branly* in Paris.

After its acquisition by Greenwell, the dirk was sold with other objects from his collection to John Pierpont Morgan, who donated them to the British Museum in 1908. The sword is first mentioned in Breuil's article published in 1900 about Bronze Age swords and daggers in the Somme river basin, after the reverend Greenwell sent Breuil several photographs of the dirk (Breuil 1900, 530-531). It is then mentioned in another article published in 1901 by Rey about the Bronze Age in the Côte-d'Or department (Rey 1901, 116) before being properly published the year after in an article by Greenwell (1902, 4-5). None of these publications give any detailed information about the discovery of this artefact, which is said to be found 'near Beaune'.

It was later suggested that it could have come from a burial mound in the area (Nicolardot 1968), but there are no clues that could confirm this purely hypothetical proposition, except the fact that the burial mound is the typical funerary architecture of Middle Bronze Age eastern France. Even if the find of a ceremonial dirk belonging to the Plougrescant-Ommerschans type in Burgundy is not impossible, considering the Middle Bronze Age exchange networks linking this region with the Atlantic, Channel and North Sea areas (see below), the total absence of information about this find, including the extensive archives of the *Commission des Antiquités de la Côte-d'Or*, should make us cautious about the truthfulness of this provenance.

12.4.1 Site context and dating

As mentioned above, according to us the ceremonial dirks belonging to the Plougrescant-Ommerschans type should be dated to the Middle Bronze Age based on typological considerations. In the specific case of the Beaune dirk, the morphology of the upper part of the blade (the butt end up to the middle) cannot be considered as meaningful for typological classification. This part was indeed reconstructed after its discovery and the bottom part, below the dark area, is the only element left from the original dirk (Needham 1990, 246).

The bottom third of the object presents the same strips observed on the other ceremonial objects of this type. This element and the ridge in the centre of the blade seem to be inspired by the Tréboul-St-Brandan swords and daggers we already presented. The dating of the Beaune dirk in

the Middle Bronze Age only relies on these typological features. No chronological difference can be identified with the Plougrescant dirk already presented on the basis of these elements.

12.4.2 Middle Bronze Age material culture in Burgundy: rapiers and swords

The Middle Bronze Age in eastern France is usually considered to be part of the period that German archaeologists identify as *Hügelgräberzeit*, the 'burial mounds period', since inhumations under *tumuli* is indeed the most common funerary practice of this time (Millotte 1963, 103; Piningre and Ganard 2017, 182-183).

In the same way as in western and northern France, this period is characterised in eastern France by the development of palstaves (*Comité des travaux scientifiques et historiques* 1988, 562), with slight typological variations compared to the Atlantic regions, and the emergence of rapiers and then swords. Although there are similar developments in the material culture of western and eastern areas, weapons coming from the Saône valley are different from a typological point of view. One of the swords dredged from the Saône river in Seurre (France, Côte-d'Or; Fig. 12.11) is one example among others of Middle Bronze Age rapiers from the region. Despite its trapezoidal butt, it is clearly different from the British dirks and belongs to the Gamprin type, mostly found in southern Germany and in Switzerland at the beginning of the Middle Bronze Age (Schauer 1971, 38-41). The hoard from Granges-sous-Grignon (Côte-d'Or) also includes a rapier with notches on the sides of the tang, typical for the Vernaion type. It is dated thanks to the associated axeheads to the end of the Middle Bronze Age (Nicolardot and Verger 1998, 18-20). Small daggers with trapezoidal butts are also characteristic of eastern France in this period (*Comité des travaux historiques et scientifiques* 1988, 565).

Middle Bronze Age rapiers found in eastern France for this period mostly indicate correlations and exchanges with the Swiss Lakes and southern Germany. This is in sharp contrast with the Plougrescant dirk that perfectly fits the Breton material culture, the Beaune sword looks more like an exotic artefact in eastern France. There are, however, a few material witnesses of relations between eastern France, Atlantic and Northwest Europe that could explain this find relating to the networks connecting Brittany, England and the Netherlands in the Middle Bronze Age.

12.4.3 The Saône valley and the Atlantic connections

If the discovery of a ceremonial dirk in Plougrescant is not a surprise considering the good connections that existed in the Bronze Age between Brittany, England and the Netherlands (see above), a similar find in Beaune is more surprising given the remoteness of this location to the above-mentioned connections and exchanges (Fig. 12.7).



Figure 12.11: A rapier with a trapezoidal butt from type Gamprin found in the Saône river in Seurre (Côte-d'Or). Musée Denon, Chalon-sur-Saône, inv. no. 87.6.2 (L. Dumont).

Even if most Middle Bronze Age artefacts found in eastern France have parallels with more easterly regions, there are also a few objects related to the Atlantic Middle Bronze Age.

Some of the typical Atlantic dirks mentioned earlier, belonging to the Tréboul-St-Brandan or the British group, have a very broad diffusion and occasionally reached the Saône and Rhône valleys. This is the case of a solid-hilted Tréboul sword found in the Rhône river in Lyon (Holste 1942, 5-7). Another dirk comes from the Saône in Seurre (Côte-d'Or; Fig. 12.12). This is a fragment of a very characteristic British rapier with a trapezoidal butt, which contrasts with the swords usually found in the region (see for instance Fig. 12.11).

The study of the palstaves strengthens the hypothesis of connections with western and northern France. Already in the 20th century archaeologists noticed the close morphology of eastern and Atlantic axes (Millotte 1963, 106). Recent morphometric analyses (Monna *et al.* 2013; Wilczek *et al.* 2015) enable a better classification of these axes and reveal complex processes of diffusion and imitation between the 'Atlantic' culture of Brittany and Normandy and the 'Tumulus' culture of Burgundy (Gabillot and Mordant 2006; Gabillot *et al.* 2017ab).

The Sermizelles hoards (France, Yonne) gives a good summary of the exchange networks eastern France was part of in the Middle Bronze Age, with palstaves and rapiers related to Brittany, northern France or southern England, but also other objects such as bracelets and spearheads suggesting a link with northwestern Europe (Gabillot *et al.* 2009, 155).

If the discovery of a Plougrescant-Ommerschans dirk near Beaune remains uncertain due to the total absence of information about its context and the reconstruction of its upper section, the study of other Middle Bronze Age finds in Burgundy shows that connections existed with the regions where the other ceremonial dirks were found. We therefore cannot exclude nor confirm the hypothesis that the Beaune dirk is really coming from Burgundy.

12.5 Description of the Beaune dirk

The Beaune ceremonial dirk is 68.1 centimetres long and has a maximum width of 16.3 centimetres. It weighs 1965 grams. It can be divided into two parts, with a limit materialised by a dark band at about one third of its length starting from the butt (Fig. 12.13). Although both sections look very similar, with the same corrosion colour and texture, the upper part is now known to be a modern restoration attached to the original part (Needham 1990, 246; see ICP analysis below). This reproduction was made with some mistakes, such as the notches Butler and Bakker (1961, 206-208) considered to be a *ricasso*, which is actually a bad interpretation of the damages at the top of the Kimberley dirk's blade (Needham 1990, 245).



20 cm

Figure 12.12: A British rapier with a trapezoidal butt found in the Saône river in Seurre (Côte-d'Or). Musée Denon, Chalon-sur-Saône, inv. no. 94.19.5 (L. Dumont).



20 cm

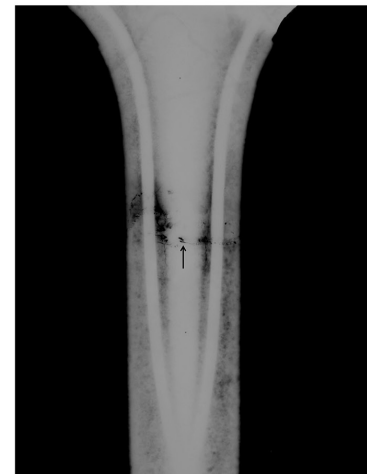


Figure 12.13: The Beaune ceremonial dirk and the radiograph of the transition between the reconstructed and the original parts (photos: RMO; X-ray: British Museum).

If we only consider the original part of the dirk, it is closely related to the other Plougrescant-Ommerschans dirks, with the typical relief strips and the central ridge imitating the Tréboul-St-Brandan dirks and daggers (see above). The tip of the blade here is better formed than on the Plougrescant sword. The Beaune sword has a rounded, blunt tip though, which differs from the Ommerschans and Kimberley dirks, whose tips are much sharper.

12.5.1 Additional analysis: composition

The composition of the dirk was analysed by X-ray fluorescence (Van Os and Theunissen 2016; see above) and ICP (Needham 1990, 243). The latter technique is much more reliable than the first one as it requires samples taken from the non-corroded metal at the core of the object. This invasive analysis gives a much clearer and more precise idea of the alloy composition, since it is not hampered by derivations from corrosion (but also see Chapter 15).

These ICP analyses (Table 12.2) show a clear difference in the composition of the metal between the upper part of the dirk, with a very low tin level and unusually high levels of lead and zinc. The addition of lead to copper and tin mainly occurred in the Late Bronze Age and remains very uncommon for the Middle Bronze Age. Zinc is even more an abnormal metal since its use is unknown in the Bronze Age. Its presence in a Bronze Age object alloy is usually a good way to identify modern copies or castings, which can sometimes be combined with real archaeological objects, as is the case with for example the Oedt (Germany, Rhineland-Palatinate) sword, consisting of a real Bronze Age blade equipped with a reconstructed hilt (Schwab *et al.* 2010).

The Beaune bottom part's composition, on the other hand, is fully compatible with a Middle Bronze Age object from the Atlantic region, with mostly copper and tin and very few trace elements, as for the Plourivo sword (Côtes-d'Armor; Briard 1965, 96).

12.5.2 Additional analysis: radiograph

The transition between the reconstructed and the original parts of the dirk was X-rayed at the British Museum (Fig. 12.13). It seems that the two parts were soldered together using a metal with a lower melting point than bronze placed

between the two elements in order to assemble them. This brazing metal is visible on the radiograph, taking the form of an irregular and very porous band. Ancient 'restorations' fixing different parts of bronze objects usually use a metallic piece inserted in the two parts to assemble them, in order to strengthen the fixation (see for example Bonnamour 1969, pl. 33). This does not seem to be the case here, although the nature of the black spots on the reconstructed part is still unknown. It could correspond to huge gaps in the metal, but also to inclusions of a different nature than bronze with a very low X-ray absorbance. Splitting the two sections of the dirk apart could be a solution to perform a more advanced examination of the metal of both parts.

12.6 Conclusion

The two ceremonial dirks found in France in Plougrescant and in Beaune remain quite 'enigmatic', even after gathering all the information about them in the archives and publications and performing analyses. In both cases, very little is known about the circumstances and the context of these finds, even if indications in the archives might lead us to identify possible plots in which the Plougrescant sword might have been found.

The question of the place of these weapons in the Bronze Age chronology also remains unsolved. A stylistic examination reveals influences from the Tréboul-St-Brandan rapiers and daggers, dating back to the beginning of the Middle Bronze Age (1700-1500 BC), but also from the British Rapiers, typical for the end of the period (Taunton phase, 14th century BC).

The study of the material culture of the regions where these ceremonial dirks come from enables us to understand their diffusion on either side of the Channel. Middle Bronze Age bronze artefacts indeed reveal the strong connections that existed between England, Brittany and Northwestern Europe. The Beaune find is more surprising as it is found far from these connections. However, finds of Middle Bronze Age rapiers and palstaves do result from interactions between eastern France and Brittany, which could explain the diffusion of this type of dirk so far from the Atlantic and Channel regions. The mystery surrounding

Lab. No.	Ag	As	Au	Bi	Cd	Co	Cu	Fe	Mn	Ni	P	Pb	S	Sb	Sn	Zn	Total
<i>Beaune Dirk</i> (WG2257):																	
BBA1248 (Hilt)	0.023	0.27	<0.003	0.02	<0.008	<0.005	81.5	0.214	<0.003	0.039	<0.02	3.85	0.04	0.03	4.96	7.58	98.5
BBA1249 (Mid)	0.019	0.23	<0.003	<0.02	0.009	0.026	84.6	0.023	<0.003	0.534	<0.02	0.138	0.09	0.10	13.6	0.012	99.4
BBA1250 (Tip)	0.020	0.22	<0.003	<0.01	<0.007	0.025	85.4	0.029	<0.003	0.547	<0.02	0.138	0.09	0.12	13.7	<0.007	100.3

< denotes less than the quoted value.

Table 12.2: Metal composition of the Beaune dirk measured using ICP, except for bismuth measures using atomic absorption spectrometry (Needham 1990, 243).

the discovery of the sword, said to come from near Beaune and the reconstruction of its upper part should, however, make us cautious about the trustworthiness of Greenwell's information and sources.

These ceremonial dirks demonstrate that all of them share a common visual identity, despite some slight differences, making each of them unique. This visual homogeneity also corresponds with their chemical unity. The ICP analyses indeed indicate that the dirks were made with a binary bronze made of copper and tin, with low levels of lead and traces of arsenic. XRF results cannot be considered relevant because of the impact of corrosion, leading to a deformation of the composition compared to non-corroded bronze.

Radiographs unfortunately did not give us the expected results about the quality of the casting and potential porosity concentrations because of the Plougrescant dirk's intensive corrosion. Invasive ICP analyses should be con-

sidered in order to see if the bronze fits the other dirks' composition pattern.

There is then more research to be carried out on these swords to try to find out more about their discovery and to study their production techniques, so that they could be fully compared to the other dirks found in the Netherlands and in England.

Acknowledgements

We would like to thank Neil Wilkin, curator of the Neolithic and Bronze Age collections at the British Museum, for all the documents about the Beaune sword he provided and allowed us to use in this article, and the C2RMF team for the radiograph of the Plougrescant dirk. We are also grateful to the editors of this book who helped us in improving our paper.

References

- Bastien, G. and Yvard, J.-C. 1977. Un poignard du Bronze moyen à Saint-Patrice (Indre-et-Loire). *Bulletin de la Société préhistorique française* 74/4, 127-128.
- Blanchet, J.-C. 1984. *Les premiers métallurgistes en Picardie et dans le Nord de la France*. Paris: Société préhistorique française.
- Blanchet, J.-C. and Lambot, B. 1977. Les dragages de l'Oise de 1973 à 1976. *Cahiers Archéologiques de Picardie* 4, 61-88.
- Blanchet, S., Mélin, M., Nicolas, T. and Pihuit, P. 2017. Le Bronze moyen et l'origine du Bronze final en Bretagne, in: Lachenal, T., Mordant, C., Nicolas, T. and Véber, C. (eds), *Le Bronze moyen et l'origine du Bronze final en Europe occidentale (XVIIe-XIIIe siècle av. J.-C.)*. Strasbourg: AVAGE, 307-323.
- Bonnamour, L. 1969. *L'âge du Bronze au Musée de Chalon-sur-Saône*. Chalon-sur-Saône: ville de Chalon-sur-Saône.
- Bradley, R. 2017. *A geography of offerings: deposits of valuables in the landscapes of ancient Europe*. Oxford: Oxbow Books.
- Breuil, H. 1900. L'âge du Bronze dans le bassin de Paris. 1. – Les épées et dagues du bassin de la Somme. *L'Anthropologie* 11, 503-534.
- Briard, J. 1956. *Le dépôt de fondeur de Tréboul en Douarnenez*. Rennes: Travaux du Laboratoire d'anthropologie préhistorique de la faculté des sciences de Rennes.
- Briard, J. 1965. *Les dépôts Bretons et l'Âge du bronze Atlantique*. Rennes: Travaux du Laboratoire d'Anthropologie Préhistorique. Faculté des Sciences Rennes.
- Briard, J. 1984. *Les tumulus d'Armorique*. Paris: Picard.
- Briard, J. 1987. Wessex et Armorique, une révision, in: J.-C. Blanchet (ed.), *Les relations entre le continent et les Iles Britanniques à l'âge du Bronze*. Amiens: Revue Archéologique de Picardie, 77-87.
- Broholm, H.C. 1935. Enkeltfund fra Bronzealderen. *Aarbøger for nordisk Oldkyndighed og Historie udgivne af det kgl. nordiske Oldskrift-Selskab* 1935/2, 257-264.
- Burgess, C.B. and Gerloff, S. 1988. *The Dirks and Rapiers of Great Britain and Ireland*. Munich: C.H. Beck (= *Prähistorische Bronzefunde* IV, 7).
- Butler, J.J. 1987. Bronze Age connections: France and the Netherlands. *Palaeohistoria* 29, 9-34.
- Butler, J.J. and Bakker, J.A. 1961. A forgotten Middle Bronze Age hoard with a Sicilian razor from Ommer-schans (Overijssel). *Helinium* 1, 193-210.
- Chopin, J.-F. and Gomez de Soto, J. 2014. Fragment de lame d'épée ou de poignard du type de Tréboul-Saint-Brandan du site du Perrou 2 à Maillé (Indre-et-Loire). *Bulletin de la Société préhistorique française* 111/3, 530-533.
- Comité des travaux scientifiques et historiques, 1988. *Dynamique du Bronze moyen en Europe occidentale*. Paris: Éditions du CTHS.
- Cordier, G. 2009. *L'âge du Bronze dans les pays de la Loire moyenne*. Joué-lès-Tours: La Simarre.
- Cowen, J.D. 1955. Eine Einführung in die Geschichte der bronzen Griffzungenschwerter in Süddeutschland und den angrenzenden Gebieten. *Bericht der Römisch-Germanischen Kommission* 36, 52-155.

- De Mortillet, G. 1869. *Promenades au Musée de Saint-Germain*. Paris: C. Reinwald.
- De Mortillet, G. and De Mortillet, A. 1881. *Musée préhistorique*. Paris: C. Reinwald.
- Fontijn, D.R. 2002. *Sacrificial Landscapes. Cultural biographies of persons, objects and 'natural' places in the Bronze Age of the Southern Netherlands, c. 2300-600 BC*. Leiden: Faculty of Archaeology (= *Analecta Praehistorica Leidensia* 33/34).
- Gabillot, M. 2003. *Dépôts et production métallique du Bronze moyen en France nord-occidentale*. Oxford: Archaeopress (= BAR International Series 1174).
- Gabillot, M. and Mordant, C. 2006. Cultures et territoires au Bronze moyen en France : approche quantitative de la production et de la consommation des objets en bronze entre "culture atlantique" et "culture orientale", in: Baray, L. (ed.), *Artisanats, sociétés et civilisation. Hommage à Jean-Paul Thevenot*. Dijon: Revue Archéologique de l'Est, 269-286.
- Gabillot, M., Forel, B., Monna, F., Naudin, A., Losno, R., Piningre, J.-F., Mordant, C., Dominik, J. and Bruguier, O. 2009. Influences atlantiques dans les productions métalliques en Bourgogne et Franche-Comté au Bronze moyen, in: Richard, A., Barral, P., Daubigney, A., Kaenel, G., Mordant, C. and Piningre, J.-F. (eds), *L'isthme européen Rhin-Saône-Rhône dans la Protohistoire. Approches nouvelles en hommage à Jacques-Pierre Millotte*. Besançon: Presses universitaires de Franche-Comté, 133-143.
- Gabillot, M., Monna, F., Alibert, P., Bohard, B., Camizuli, E., Dommergues, C.-H., Dumontet, A., Forel, B., Gerber, S., Jebrane, A., Laffont, R., Navarro, N., Specht, M. and Chateau, C. 2017a. Productions en série vers 1500 avant notre ère ; notion de règle de fabrication au Bronze moyen (environs 1500 avant J.-C.) entre Manche et Alpes, in: Mordant, C. and Wirth, S. (eds), *Normes et variabilités au sein de la culture matérielle des sociétés de l'âge du Bronze*. Paris: Société préhistorique française, 19-32.
- Gabillot, M., Wilczek, J. and Monna, F. 2017b. La production métallique au Bronze moyen entre la Manche et les Alpes : des relations complexes entre zones-ateliers interdépendantes, in: Lachenal, T., Mordant, C., Nicolas, T. and Véber, C. (eds), *Le Bronze moyen et l'origine du Bronze final en Europe occidentale (XVIIe-XIIIe siècle av. J.-C.)*. Strasbourg: AVAGE, 839-850.
- Gallay, G. 1988. *Die mittel- und spätbronze- sowie ältereisenzeitlichen Bronzedolche in Frankreich und auf den britischen Kanalinseln*. Munich: C.H. Beck (= *Prähistorische Bronzefunde* VI, 7).
- Greenwell, W. 1902. On some rare forms of Bronze Weapons and Implements. *Archaeologia* 58/1, 1-16.
- Holste, F. 1942. Ein westeuropäisches Vollgriffschwert aus Süddeutschland. *Germania* 26, 4-12.
- Jouys-Barbelin, C. and Louboutin, C. 2017. Cent cinquante ans d'enrichissement: politique d'acquisition et de gestion des collections du musée d'Archéologie nationale. *Antiquités nationales* 47, 7-32.
- Laux, F. 2009. *Die Schwerter in Niedersachsen*. Stuttgart: Franz Steiner (= *Prähistorische Bronzefunde* IV-17).
- Lebrasseur, J. 1994. Poignards de l'âge du Bronze. *Bulletin de la Société d'archéologie Préhistorique et archéologique du Rouvray* 8, 28-32.
- Le Maire M. 2017, *Les tumuli de l'âge du Bronze dans le nord-ouest des Côtes-d'Armor, rapport de prospection-inventaire thématique*. Rennes: Service Régional de l'Archéologie.
- Le Roux, C.-T. 1975. Circonscription de Bretagne. *Gallia préhistoire* 18.2, 511-539.
- Mariën, M.E. 1952. *Oud-België van de eerste Landbouwers tot de komst van Caesar*. Antwerp: De Sikkel.
- Micault, V. 1882. Description de sept épées et d'un poignard en bronze découvert à Saint-Brandan (Côtes-du-Nord). *Bulletins et mémoires – Société d'émulation des Côtes-du-Nord. Compte rendus et Mémoires, tome XXI*, 55-69.
- Micault, V. 1883. Épées et poignards de bronze des Côtes-du-Nord, Finistère et Ille-et-Vilaine. *Bulletins et mémoires – Société d'émulation des Côtes-du-Nord. Compte rendus et Mémoires, tome XXI (1883)*, 71-123.
- Millotte, J.P. 1963. *Le Jura et les Plaines de Saône aux âges des métaux*. Paris: Les Belles Lettres.
- Mödlinger, M. 2011. *Herstellung und Verwendung bronzezeitlicher Schwerter Mitteleuropas*. Bonn: Habelt.
- Mohen, J.-P. 1977. *L'âge du Bronze dans la région de Paris. Catalogue synthétique des collections conservées au Musée des antiquités nationales*. Paris: éditions des Musées nationaux.
- Monna, F., Jebrane, A., Gabillot, M., Laffont, R., Specht, M., Bohard, B., Camizuli, E., Petit, C., Chateau, C. and Alibert, P. 2013. Morphometry of Middle Bronze Age palstaves. Part II – spatial distribution of shapes in two typological groups, implications for production and exportation. *Journal of Archaeological Science* 40/1, 507-516.
- Needham, S. 1990. Middle Bronze Age ceremonial weapons: new finds from Oxborough, Norfolk and Essex/Kent. *The Antiquaries Journal* 70.2, 239-252.
- Nicolardot, J.-P. 1968. *Protohistoire de la montagne beaunoise*. Université de Bourgogne: PhD thesis.
- Nicolardot, J.-P. and Verger, S. 1998. Le dépôt de Granges-sous-Grignon (commune de Grignon, Côte-d'Or), in: Mordant, C., Pernot, M. and Rychner, V. (eds), *L'atelier du bronzier en Europe du XXe au VIIIe siècle avant*

- notre ère. 3. *Production, circulation et consommation du bronze*. Paris: CTHS, 9-32.
- Piningre, J.-F. and Ganard, V. 2017. Le Bronze moyen et le début du Bronze final dans le Jura et la plaine de la Saône, in: Lachenal, T., Mordant, C., Nicolas, T. and Véber, C. (eds), *Le Bronze moyen et l'origine du Bronze final en Europe occidentale (XVIIe-XIIIe siècle av. J.-C.)*. Strasbourg: AVAGE, 157-192.
- Reinach, S. 1874. *Catalogue sommaire du Musée des antiquités nationales au château de Saint-Germain-en-Laye (3e édition revue et augmentée)*. Paris: Librairies-Imprimeries réunies.
- Rey, F. 1901. Étude sur l'Âge du Bronze dans le département de la Côte-d'Or. Extrait du *Congrès archéologique de France, LXVIe session, 1899, Mâcon*. Paris: Picard, 102-118.
- Sandars, N.K. 1957. *Bronze Age Cultures in France. The later Phases from the thirteenth to the seventh Century B.C.* Cambridge: Cambridge University Press.
- Schauer, P. 1971. *Die Schwerter in Süddeutschland, Österreich und der Schweiz I (Griffplatten-, Griffangel- und Griffzungenschwerter)*. Munich: C.H. Beck (= *Prähistorische Bronzefunde IV*, 1).
- Schauer, P. 1984. Spuren minoisch-mykenischen und orientalischen Einflusses im atlantischen Westeuropa. *Jahrbuch des Römisch-Germanischen Zentralmuseums Mainz* 31, 137-186.
- Van Os, B. and Theunissen, L. 2016. *Five of a kind. Elemental analysis of five large Bronze Age dirks of the Plougrescant-Ommerschans type*. Amsterdam: Rijksdienst voor het Cultureel Erfgoed.
- Warmenbol, E. 1986a. British Rapiers with Trapezoidal Butt found in Belgium. *Proceeding of the Prehistoric Society* 52, 153-158.
- Warmenbol, E. 1986b. Quelques considérations à propos des relations entre la Nord-Ouest de l'Allemagne et la Belgique au Bronze Moyen. *Archäologische Mitteilungen aus Nordwestdeutschland* 9, 13-34.
- Warmenbol, E. 1995. L'âge du Bronze final en Haute Belgique. Bilan et perspectives, in: Zu Erbach, M. (ed.), *Beiträge zur Urnenfelderzeit nördlich und südlich der Alpen*. Bonn: Habelt, 75-90.
- Warmenbol, E., Cabuy, Y., Hurt, V., Cauwe, N. and Piette, F. 1992. *La collection Édouard Bernays : Néolithique et âge du Bronze, époques gallo-romaine et médiévale*. Bruxelles: Musées Royaux d'Art et d'Histoire.
- Wilczek, J., Monna, F., Gabillot, M., Navarro, N., Rusch, L. and Chateau, C. 2015. Unsupervised model-based clustering for typological classification of Middle Bronze Age flanged axes. *Journal of Archaeological Science: Reports* 3, 381-391.