

ARCHAEOLOGICAL SMALL FINDS RECORDING IN THE NETHERLANDS: THE FRAMEWORK AND SOME PRELIMINARY RESULTS OF THE PROJECT PORTABLE ANTIQUITIES OF THE NETHERLANDS (PAN)

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Introduction

Portable Antiquities of the Netherlands, or PAN, was launched in 2016. It is a long-term project, whose aim is the recording and online publication of archaeologically relevant artefacts, in first instance especially those made by non-professional metal detector users. The innovative aspect of PAN is that the recorded finds are identified in a specific uniform way, which not only allows easy and efficient processing, but also lends itself well for re-use by academic researchers, excavation companies and museum staff.

In this contribution, the organisational and methodological backgrounds of PAN are presented. A single case study based on one category of finds, already recorded in large numbers on the PAN website, is also included, focusing on early medieval enamelled disc brooches. It is an overarching aim of the PAN project to conduct wider research based on its data and database structure, and therefore some preliminary results of the spatial and typological analyses of these finds are presented in the second half of this article, addressing the question how they match with current research on communication and exchange in the early medieval Netherlands, and how they might generate new research questions.

PAN: why, by whom and for whom?

Why PAN?

Thousands of archaeological objects are found in the Netherlands outside of official excavations every year, predominantly by hobbyist metal detector users walking the fields or beaches, but also by other groups, such as for instance farmers working their fields. The data on finds need to be recorded and secured to enhance our knowledge about the past. There were two major incentives that prompted the initiation of PAN and its launch in 2016.

First, metal detection as a hobby took off in the 1970s, and many collections were composed and grew from that time on. Some of these collections, or parts of them, are documented, but it is safe to say that the majority have remained largely unknown. These private finds are highly relevant to archaeological researchers, museums and heritage professionals. Since they are hidden away in private collections they are hardly ever included in research and neither are they systematically

documented. The first generations of metal detector users are getting older now, and private collections are at risk to become lost after their finders die. Unfortunately this already happened to some very important collections. The valuable knowledge on the find locations often dies with the owners, which makes the collections almost useless for academic purposes. The urgency of a decent registration system in which both finds and find locations would be preserved was becoming more and more obvious for archaeologists in the Netherlands.

Another major incentive was a change in the law. Until early 2016, metal detection was illegal in the Netherlands. Archaeological excavation was and is restricted to institutions like universities, municipal services and companies, who must apply for excavation permits and can receive these only if they meet certain regulations on the quality of their fieldwork as well as consistent publication of results. People were allowed to metal detect, but excavation of any finds was illegal, although widely condoned. This somewhat-awkward situation changed with the Heritage Act of 1 July 2016, which specified that the top 30cm of the soil was exempt from the restrictions. Excavation of the top layer is now allowed, with the exception of that over scheduled monuments and on on-going excavations. Permission from the landowner to the metal detector user must be given beforehand, however, and finds must be reported. As in England, the landowner and finder are considered joint owners and share either the finds or, in case of a sale, their monetary value.

It was this change in the law that gave green light to the start of PAN. The finds registered in PAN are now untainted by the ambiguous character of being retrieved in what was, in fact, an illegal way. The project officially started in September 2016 and the first development phase runs until 2020. The infrastructure will then be adopted by the Heritage Agency of the Netherlands (RCE) and taken forwards.

By whom?

The initiative for PAN was taken by members of CLUE+ (an interfaculty research institute for culture, cognition, history and heritage) of the Vrije Universiteit Amsterdam (VUA) (Free University Amsterdam), in close collaboration with researchers of other universities and the Heritage Agency of the Netherlands (RCE). A call for proposals regarding research infrastructures was running in 2015 and in March 2016 the Dutch Science Organisation (NWO) awarded the PAN proposal a

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substantial grant, after which the software development could start. The first versions of the software were available when the Finds Liaison Officers and Finds Specialist started their work in September 2016. It proved to be a highly effective system: by the end of that first year, 56 detector users were visited and approximately 4,500 finds from 86 locations were documented. By April 2018, more than 320 detectorists had reported almost 32,000 finds from 2,900 locations.

Apart from the joint investment of VUA and Leiden and Groningen universities, The National Bank (DNB) processes the coins and publishes these in the Dutch national numismatic database NUMIS, which is digitally linked to PAN. What is more, staff from KUNERA – a website which gives access to a database of more than 15,000 religious and profane medieval badges, hosted by the Radboud University Nijmegen – identify all the medieval badges documented in PAN. The software is developed by Geodienst, liaised to Groningen University and an official project partner. The network is completed by local museums giving hospitality to Find Liaison Officers (FLOs) – who visit different locations as part of their visits to liaise with metal detectorists – and of course by associations of metal detector users and volunteer archaeologists.

The metal detectorist community in the Netherlands consists of a number of well-organised detectorist clubs, more loosely connected groups of detectorists, and detectorists who only operate as individuals. It is estimated that between 7,000 and 20,000 metal detectorists are active in the Netherlands. PAN aims at getting in touch with all of them, so finds are not only published on the numerous detectorist forums, but also on the PAN website, according to precise guidelines which enhance the research potential of the finds.

When detector users get in touch with PAN, they are visited by one of the FLOs, who document the find locations and photograph the objects. They meet in museums, depots, ArcheoHotspots (outreach centers) or at the home of the finder. Finds are documented there, or sometimes borrowed by the FLOs in order to process the finds at the office.

At the moment seven part-time FLOs and three Finds Specialists form the PAN staff at the VUA, plus various specialists from allied organisations, as well as a project leader and co-coordinator. PAN and the Heritage Agency of the Netherlands (RCE) guarantee continuity of a small professional staff after the first four-year PAN project term ends.

In the near future, volunteers will be trained to assist in the documentation of finds collections and/or to assist with object identifications. Associations of volunteer archaeologists and metal detector users (AWN, AWL, the DetectorAmateur, Coinhunter Company) and an online forum for metal detector users (www.bodemvondstenwereld.nl) already support PAN by publishing information about the organisational aspects of the project, encouraging finders to report their finds.

More and more input is also coming from the detector users themselves: some have specific knowledge of a period or a certain group of objects. They are encouraged to participate in the construction of the reference collection by providing their specialist knowledge

on specific find groups. The case study of the in PAN recorded early medieval enamelled disc brooches below explains how the reference collection is constructed.

The name Portable Antiquities of the Netherlands (PAN) is partially inspired by the Portable Antiquities Scheme running in England and Wales (www.finds.org.uk). PAS is a similar undertaking that was established in 1997 and became a national scheme in 2003 (Bland 2005; Lewis 2016). PAS provided the example for a recording scheme in the Netherlands. However, PAN is not just a copy of PAS. The greater reliance on volunteers, and also the system of reference types for object identifications developed by Pan are innovations. This will be explained in more detail in what follows.

For whom?

PAN aims at being an inclusive programme in which not only academics and heritage professionals can participate but also others, from all sorts of backgrounds, who are interested in the past.

In academic archaeological research in the Netherlands, excavations have always been the major source of information. However, as archaeologists have come to realise more and more, professional excavations cover only a very small portion of all the potential sites available. Many unexcavated sites can be recognised by the scatter of portable finds on the surface, and many of these sites are visited by members of the public with metal detectors, or associations of volunteer archaeologists. These ‘private’ discoveries add important information to existing spatial distribution maps of material culture relevant to research regarding habitation, trade, travel and migration, thereby significantly enhancing their potential for research.

In a country as built-up and densely populated as the Netherlands, heritage is often threatened by construction works. As elsewhere in Europe, before building starts, archaeologists in the service of spatial planners conduct research to establish to what extent the planned works may destroy natural or cultural sites. Discoveries made by members of the public increase existing knowledge about potential archaeological sites and, if documented properly, have the potential to contribute usefully to decision-making processes surrounding developer-funded fieldwork. The PAN dataset of exact find locations can be accessed by the archaeologists investigating the archaeological potential of the development area.

Research and heritage are of course not the business of professionals alone. The past is from and for the whole community and funded by the taxpayer. It is vitally important to show to the general public what archaeologists do. Archaeological small finds are very suitable to do that. Some objects are very beautiful in themselves, but it is equally possible to tell a fascinating story based on a seemingly ugly and worn fragment of an artefact. By showing objects and the stories behind them in their context, and by reaching out to the general public to document their finds, a firm connection between research, heritage, metal detector users and the general public is forged.

PAN: how does it work?

The web based system

PAN aims at being more than an online database of finds. Its innovative aspect is that all individual finds are (going to be) matched with a reference type. This combines date and typology.

During the initial four-year phase of the PAN project, finds dating from early prehistory to *c.* AD 1600 will be covered. The way that finds are recorded makes them easily quantifiable. Identifying and recording a find is not a case of writing repetitive elaborate descriptions, but of making specific choices on a pre-defined data sheet. Data sheets or 'reference types' are available for all types and groups of objects.

This inclusive aspect, creating a digital reference collection for all archaeological artefacts predating the sixteenth century, is also one of the ambitions that the acronym PAN – the Greek word for 'all' – expresses. This reference collection is maintained by finds specialists of the prehistoric, Roman and medieval periods, as well as external participants with specialist knowledge. All the defined reference types are based on a careful examination of the most recent and available studies on specific object groups, and consist of detailed typological descriptions and a representative drawing.

The descriptions capture the defining physical characteristics of a given type, its dating, and additional information, such as the exact parameters for internal variability of the defined type, as well as a preferred label, alternative names, references and other links. Where possible and/or required, boundaries and overlap with other types are discussed, as are current distribution patterns, including areas that extend beyond the borders of the Netherlands.

The process can be easily evaluated. The descriptions should explain the choices that were made regarding the definition of reference types and the up-to-date knowledge of each type. Both the descriptions and the bibliographical references make it possible for other researchers or interested people to evaluate the information provided. The information is available as Linked Open Data and therefore accessible to everyone who would like to use the PAN reference types in a database structure.

All the individual finds are published on the public website and several browse or selection options are available. Attached to each individual find is the associated reference type information, which consists of the reference type drawing, standard descriptions, periodization and on-line links. It is also possible to use a specific 'reference collection' icon on the website as a digital tool for object identification; people can compare their object of interest with standardised ideal pictures of objects. The common visitors of the website will see all the validated objects and can perform simple searches. They cannot see the exact find locations – a strong wish of the metal detector users to protect the find location from other visitors.

The finders who report finds receive a login account to the PAN website, which allows them to see their own complete collection online, including those finds which are not yet validated (*i.e.* not yet connected to a reference type), and thus not visible on the public

website. Some finders are also given an account to enter finds themselves; they can take a PAN tutorial after which they are credited as PAN volunteer. It is the aim of PAN that in the future these volunteers will assist other detector users with reporting their finds to PAN: as such small scale communities can be established throughout the country, they can become long-term active participants of PAN.

Researchers can get access to the data and the search tools after their research credentials have been checked. Approved researchers can download datasets with exact find locations. Various search options are available once logged in into the research domain of the website. One can create overviews of groups of objects or specific types, but it is also possible to search by spatial location and get an impression of the diversity of metal objects found there. The search results are not only available as lists but also as distribution maps, which can be downloaded from the website.

The PAN reference collection: early medieval enamelled disc brooches

The discussion below focuses on early medieval enamelled disc brooches to illustrate the choices that lead to the creation of reference types in the PAN database. The system is flexible: the reference-type scheme is constructed in such a way that newly reported variants can easily be added as new types or sub-types. As such the reference collection will never be exhaustive: it is a dynamic and flexible system whose main categorisation is fixed, but to which new types and sub-types (variants) can be added at lower levels in the database structure.

The structure of a reference type will now be discussed for a specific group of enamelled brooches. Brooches of all periods are the most frequently reported finds. The identified pin constructions (attachment fittings) facilitate a clear and already partly period-defining first entrance into the tree of reference types for brooches.

In total fourteen different types of pin construction can be identified, of which three are specific to the medieval period (Heeren and Van der Feijst 2017, 12, 15–16, construction 7, 8 and 14; compare Frick 1992–1993, 247–248). These are the spring mounted on a single lug, the spring mounted on two lugs and the eye-hook construction (Fig. 1). These constructions also have some chronological significance within the medieval period, although this needs to be defined further on the basis of future finds. Another point still under investigation is whether all types of form and decoration occur in more than one pin construction type, or whether some types have only one sort of construction. These constructions may be specific to certain manufacturing centres or regions.

After the pin construction type is chosen, the specific brooch form becomes relevant, which is a second 'level' within the database structure. The early medieval enamelled disc brooches all have an eye-hook construction. They include a lengthy list of PAN reference types, based on their form, which can be defined as round disc brooches with a decorative front side consisting of sunken fields (often also referred to as cells). They include not only brooches whose cells are/ were originally enamelled, but also brooches whose cells were probably never enamelled. The whole group

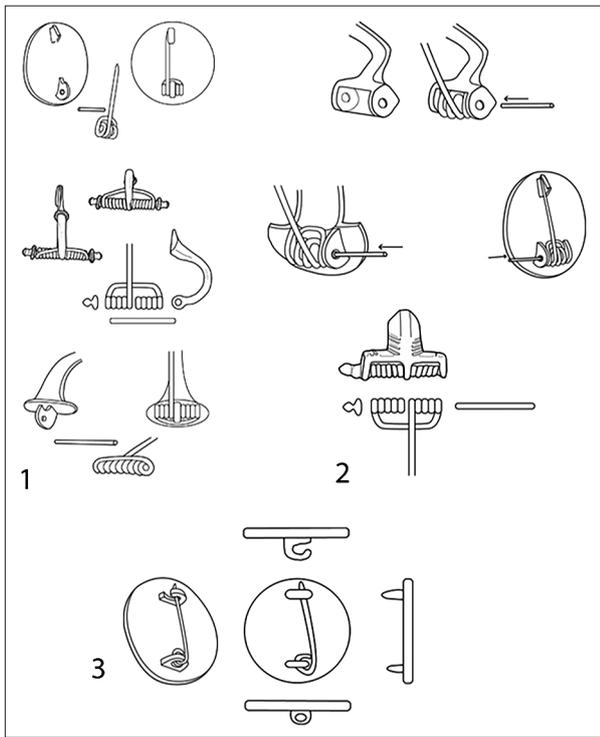


Figure 1 The three pin constructions used on early medieval brooches: 1) spring mounted on a single lug; 2) spring mounted on two lugs; 3) eye-hook construction (after Heeren and Van der Feijst 2017, 13, Fig. 2.3).

is therefore labelled as ‘disc brooches with enamel/sunken fields’. This terminology avoids having to make choices about the absence or presence of enamel, which can sometimes be difficult to establish.

As a side note, at an early stage the PAN team noted some terminological inconsistency with regards to the decorative technique of enamelling between different publications, which the PAN database has already made progress in solving. Frequently used terms are the *champlevé* (French) or *Grubenschmelz* (German) technique opposed to the *cloisonné* technique. *Champlevé* or *Grubenschmelz* refers to enamel that is applied to the sunken fields at a secondary stage of production, when an enamel fill is placed in the existing brooch and heated to secure it to the metal. The *cloisonné* brooches are of a different kind: here, the figurative cells are made from sheet metal, and are placed in a sunken field covering the entire front side of the disc, which is completely filled with enamel.

In addition, Bos (2008, 730) also refers to cast cells, but this is a technique that is not mentioned by Frick (1992–1993) or Wamers (1994) in their discussion of the same types of brooches from the northern parts of the Frankish realm and found in Mainz, Germany respectively. Bos’s brooches with cast cells resemble or are similar to some of the brooches by Frick and Wamers defined as *champlevé* brooches (for example the brooches defined as Frick’s type 1 (Frick 1992–1993, 260–262) and Wamers’s type 3 (Wamers 1994, 54–61)). However, Bos does not provide a definition of cast cells and neither explains how he distinguished between cast and *champlevé* cells.

After a careful examination of the drawings available in the catalogues of Bos, Frick and Wamers, a newly created definition was therefore put forward in PAN. It is suggested that the cells made by the *champlevé* technique are cruder and show more space between them than the cast cells.

A third ‘level’ in the database breaks down the groups on the basis of their decoration. At this stage, the larger group of enamelled/sunken field disc brooches is further subdivided on the basis of their decorative patterns: disc brooches with cross motifs (Group A); disc brooches with concentric circles, also called navel disc brooches (Group B); disc brooches with human figures (Group C); and disc brooches with animals (Group D).

For each of these groups (except the navel brooches) several types are defined (Fig. 2). These are all based on careful consideration of specific characteristics that have either chronological significance or research potential (or both). The next section presents the number of enamelled/sunken field disc brooches that have so far been recorded in PAN, and the new insights these results have yielded.

Early medieval enamelled/sunken field disc brooches in PAN: the first results

At the time of writing this paper, a total of 566 enamelled/sunken field disc brooches had been published on the PAN website. The four groups (A–D) show considerable differences in the quantities with which they occur, but taken together the whole collection of brooches demonstrates some interesting spatial distribution patterning, which will be discussed in more detail below (Figs 3a, 4 and 5). First, the discussion will turn to a summary of the different typological groups.

Group A: enamelled brooches with cross motifs (AD 800–1000)

These brooches are defined by cells (both *champlevé* and *cloisonné*) that are arranged in the form of a cross, and which were originally always filled with enamel. The variability within this group is large (Fig. 2), and it is likely that the specific spatial distributions of the sub-types will reveal some interesting patterns once more finds are registered.

The different cross types were predominantly defined on the basis of Bos’s (2008) typology of finds from the northern Dutch province of Friesland. Bos’s classification is the most detailed for the Netherlands to date, and the variety of metal-detected finds reported to PAN up to now match with this defined variation. In the database, these types are numbered according to the PAN system (A1–A23), and the associated Bos type is referred to in the descriptions.

The Bos typology is now gradually being expanded: new discoveries have come to light that have either been added as variants or as new types. An example is PAN type A5 (= type Bos 2.5.1.9), which is defined by three inward curved *cloisonné* cells; now, however, specimens with four *cloisonné* cells are also known. (A similar specimen is included as an example of type 2 in the catalogue of German brooches compiled by Frick (Frick 1992–1993, 262, Table 2, 178), but since the associated definition of his type 2 is quite broad

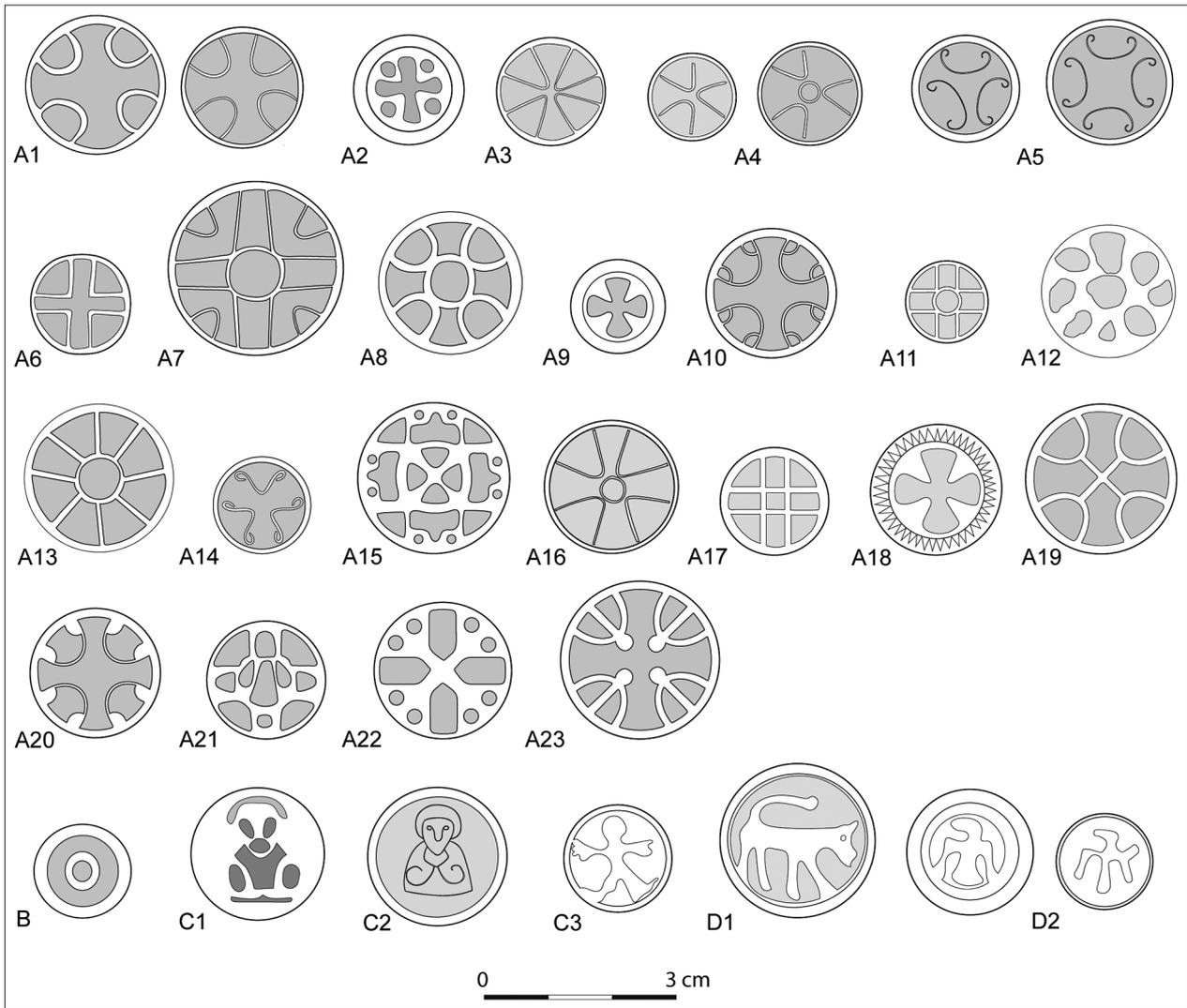


Figure 2 The variety of early medieval enamelled/sunken field brooches. 1) Group A1–23: brooches with cross motif; 2) Group B: navel brooches; 3) Group C1–3: saint/human figure brooches; 4) Group D1–2: animal brooches (drawings from PAN project).

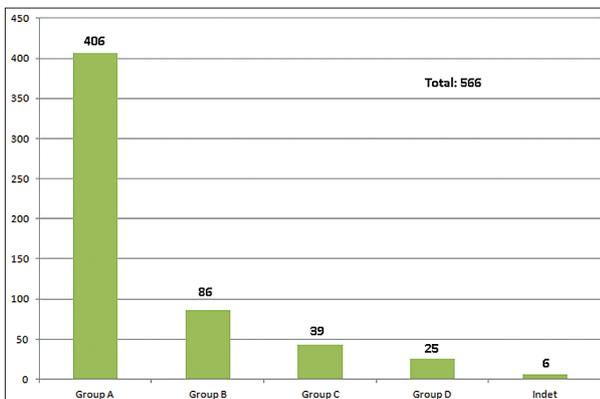


Figure 3a. The numbers of finds for the groups A–D of enamelled/sunken field disc brooches.

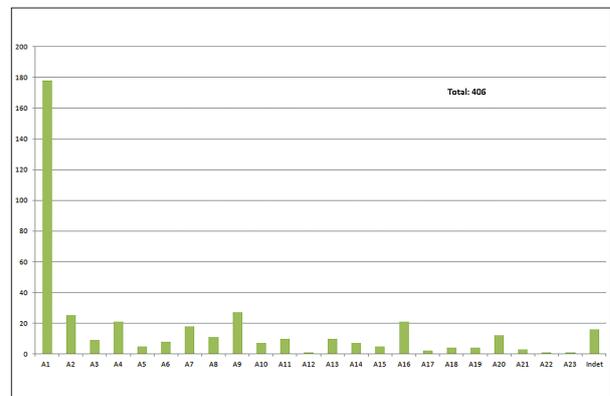


Figure 3b. The number of finds for the types of brooches with cross motifs.

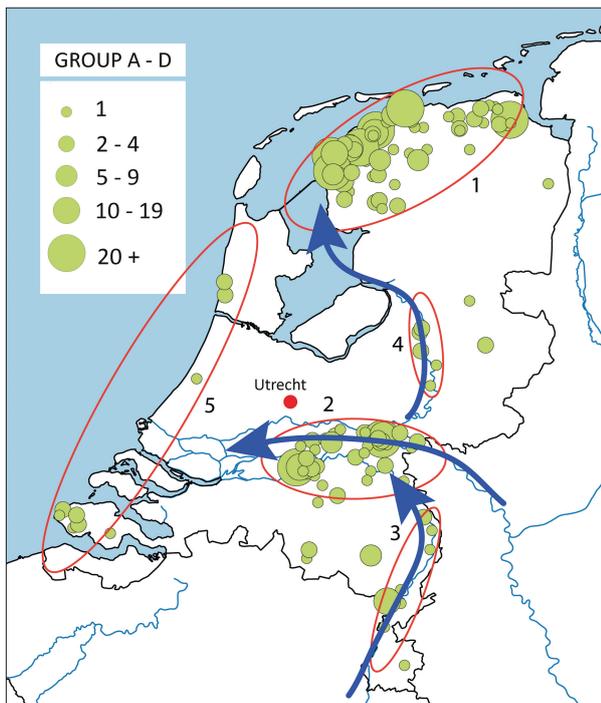


Figure 4 Distribution map of group A–D reported so far in PAN. 1) Northern coastal area; 2) Dutch river area; 3) River Maas area; 4) River IJssel area; 5) Western coastal area. Blue arrows: riverine route of brooch transportation from the south to the north and the two locations where the brooches may have entered the Netherlands (map from PAN project).

(brooches with pelta-shaped cells, including *champlevé* cells), and does not refer to the number or the specific appearances of the cells, it cannot be established how many brooches with four inward curved *cloisonné* cells were actually found outside the borders of the Netherlands.)

Altogether, 23 reference types for enamelled cross motif brooches have been defined (Fig. 2), and 406 specimens have been reported and published online. Fig. 3b quantifies these 23 reference types. It shows that type A1 occurs most frequently, and that all the other types are more scarce. This most frequent type is considered to be the prototype for the group of brooches with cross motifs: it consists of four cells forming a cross with expanding arms. All the other brooches with cross motifs can be argued to be in one way or another derived from this specific type.

The current distribution pattern shows a clear concentration along the coastal regions of the Northern provinces, but specimens of this group also occur in other parts of the Netherlands (Fig. 5a). This pattern may, in this early stage of the project, be related to the reporting frequency of metal detector users. For example, only one find from the entire area along the western coast has been reported to PAN, and only four are known from the southern coastal province of Zeeland. Wamers, on the other hand, has published several additional finds from the Netherlands, including from this same coastal area, in his overviews of brooches found in Mainz, Germany (Wamers 1994, 50–69, Abb.31–42).

Next to the predominant concentration along the northern coastal areas, another concentration can be observed in the central Dutch river area. Apart from a few isolated finds in the southernmost province of Limburg, wedged between present-day Belgium and Germany, the regions in between are nearly empty. It remains to be questioned how these high concentrations in the north of the Netherlands and in the Dutch river area relate to each other, and how the areas without finds should be explained.

The reference type for this group is available under <https://pan.service.rug.nl/pan/#/public/reference-type/01-01-14-01-01#01-01-14-01-01>.

Group B: enamelled navel brooches (AD 800–900)

These brooches with concentric circles form a homogeneous group without subtypes. A number of 86 specimens are now recorded in PAN. Their distribution pattern is quite similar to that of other types of enamelled brooches (Fig. 5b): the major concentration can be found in the northern provinces (62 specimens) and a second concentration in the central Dutch river area (nine specimens). Again, they occur in lower numbers in other parts of the country, showing no specific pattern as of yet, and they do not occur in areas that are also devoid of group A brooches.

The reference type for this group is available under <https://pan.service.rug.nl/pan/#/public/reference-type/01-01-14-01-02#01-01-14-01-02>.

Group C: enamelled/sunken field brooch with human figure (AD 700–1000)

This group of medieval disc brooches with enamel/sunken fields consists of the well-known saints brooches and the less well known brooches with an *orante* (praying) figure. The classification for the brooches with saints is not as detailed as that for the brooches with cross motifs; a distinction is only made on the basis of the technical execution of the decorative front – *champlevé* (AD 750–900) versus *cloisonné* (AD 750–850) – since they show marked differences in quality, which may indicate craft expertise. Various sub-types can be defined on the basis of the way in which the saint is depicted, but this has not been classified yet as the number of finds remains limited.

A number of 37 *champlevé* and two *cloisonné* saints brooches are reported. The distribution pattern is quite similar to that of the brooches with cross motifs (Fig. 5c); a major concentration along the coastal area of the northern provinces (twenty *champlevé*, one *cloisonné*), a second concentration in the Dutch river area (ten *champlevé*), and just a few finds along the western coast and along the Meuse river in the south of the Netherlands.

One other type was placed under the group of human figures; it is not certain whether it was originally filled with enamel, but probably it was not. The *orante* (praying) figure is formed by a relief in a sunken field applied by the *champlevé* technique. Only three are recorded up to now (AD 700–1000); they are all found in the northern coastal area.

The reference type for this group is available under <https://pan.service.rug.nl/pan/#/public/reference-type/01-01-14-01-03#01-01-14-01-03>.

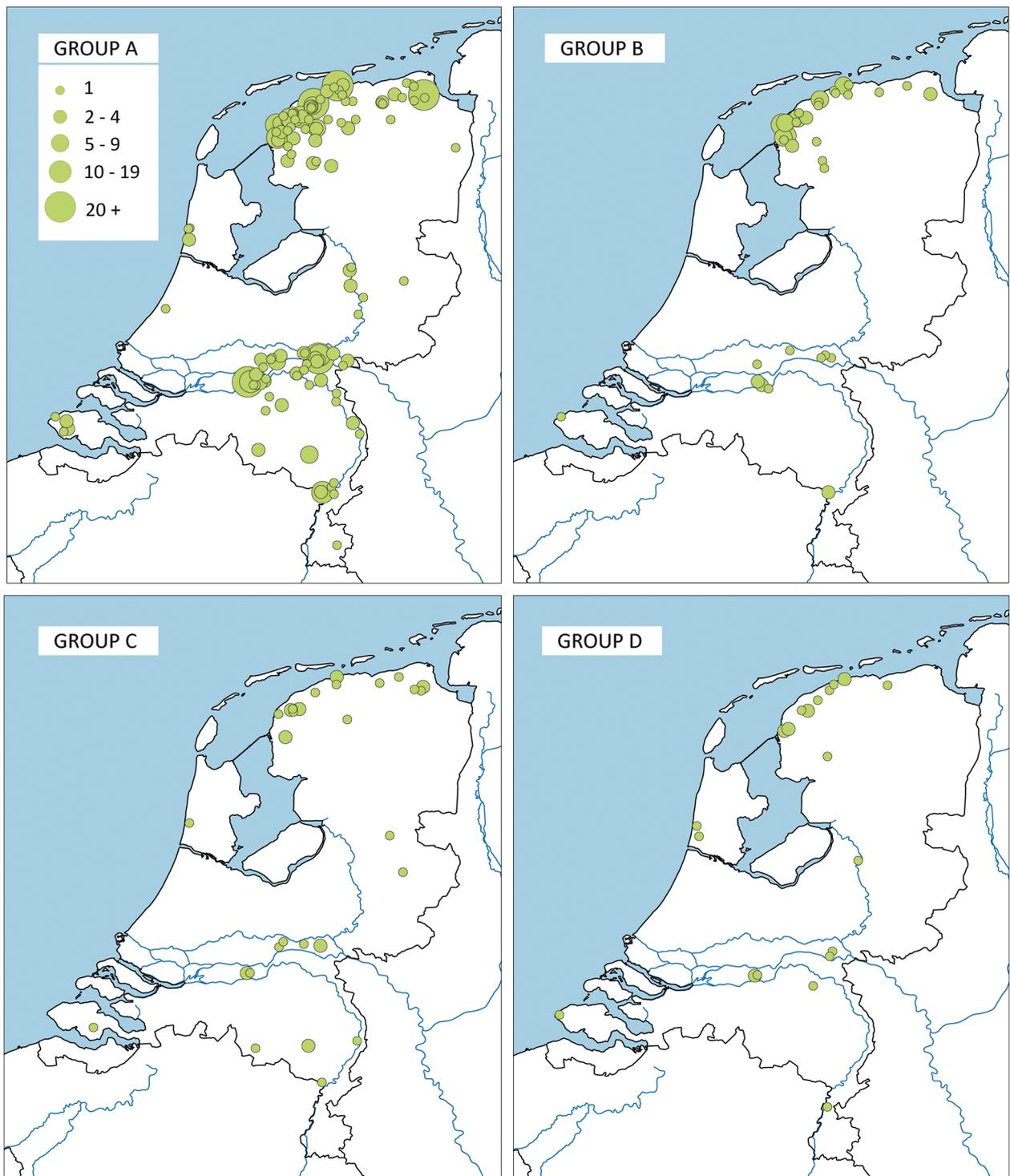


Figure 5 A) Distribution map of group A (enamelled disc brooches with cross motif) reported so far in PAN. B) Distribution map of group B (enamelled navel brooches) reported so far in PAN. C) Distribution map of group C (enamelled/sunken field brooches with human figure reported so far in PAN. D) Distribution map of group D (enamelled/sunken field animal brooches) reported so far in PAN (maps from PAN project).

Group D: enamelled/sunken field brooch with animal motif (AD 700–1000)

The fourth group consists of all the brooches with sunken fields depicting an animal in relief. Some brooches were probably never filled with enamel. The group is quite diverse.

The first type consists of brooches with a forward looking quadruped in relief against a sunken field (AD 800–900). The background seems usually to have been filled with red enamel. With only nine specimens recorded, they are quite scarce, but nonetheless less scarce than Frick presented them to be (Frick 1992–1993,

Type 1, variant 2, 296–302). Their find locations show only a slightly stronger concentration in the Northern provinces than in the central Dutch river area (Fig. 5d).

The second type consists of brooches depicting a bird (AD 700–1000). Two sorts of bird motifs are identified. The first depicts a bird with spread wings and left-facing head in relief against a sunken field surrounded by a circle in relief.

The second is an ambiguous motif, differently interpreted in the literature, but here considered to be a bird. It is similar to the other bird; its head is also facing left and it has at least one spread wing (the left one). The feature to the right of the body shows two extremities; it can be interpreted as a claw that can be seen on Merovingian bird brooches.

Since the two birds show quite some similarities, they are for now registered as one type. Future finds may lead to the definition of additional subtypes. A number of fifteen specimens are so far reported, of which the one with the ‘claw’ is the most frequent. The distribution pattern again shows a concentration in the north and a second, minor concentration in the Dutch river area (Fig. 5d).

The reference type for this group is available under <https://pan.service.rug.nl/pan/#/public/reference-type/01-01-14-01-04#01-01-14-01-04>.

Framing the finds in current research

The example of the early medieval enamelled/sunken field disc brooches in PAN demonstrates that the reference collection of a specific find category can be constructed as broad general groups and, if necessary, also more specific types or variants. It is a flexible system which allows future refinement when required by new recorded finds.

The quantities of the specific variants of brooches with cross motifs are still too small for significant spatial comparative analysis, but it is by now apparent that some variants occur more regularly than others (Fig. 3b).

On a broader level, however, the four main groups A–D do already show some interesting spatial patterning, even though biases introduced by external factors – such as favourite detecting spots, or specific landscape conditions – must be considered a possibility. Underneath this, however, it is possible to discern the impact of the early medieval landscape and settlement on the distribution patterns, raising the question whether these reflected actual settlement locations, or were the result of various other social distribution mechanisms. How, then, does this spatial patterning relate to current research, and can it contribute to new insights or research questions?

Since PAN produces spatial overviews of specific finds, the first obvious research questions regarding the group of enamelled/sunken field brooches relate to the organisation of their production, the distribution mechanisms involved and to the understanding of production and distribution in the specific social context of the period.

The brooches with cross motifs (group A) and the saints brooches (group C) bear overt Christian signs (see also Weetch 2014, 194 ff). For the animal brooches (group D) and the navel brooches (group B) the reference to Christianity is not straightforward. They fall, however,

in the same time period and are similar in execution. It seems justifiable therefore to place them in the same socio-economic system of production, distribution and appropriation.

With regard to their production, Roxburgh *et al.* (2014, 121–129) have demonstrated that the metal compositions of the brooches with cross motifs and the saints brooches are quite uniform, as are their diameters and thickness. This suggests that they were not produced by travelling merchants, at domestic households or at primitive workshops. Their production was organised on a larger scale. Their distribution moreover shows little spatial variability, also pointing towards centralised production and a large distribution area.

Roxburgh *et al.* (2014) therefore suggest that these brooches were produced in large monastic centres, predominantly located outside the present-day borders of the Netherlands. Their production centres gave the brooches an added religious dimension.

Roxburgh *et al.* (2014, 127) depict the associated distribution mechanism as a form of exchange ‘firmly anchored in a Christian imaginary world’. The spatial coincidence between their production centres and religious environments placed their distribution outside the rules of secular economic exchange. Such specialised brooch production took place only at a few monastic sites, resulting in a supra-regional model of production. The monastic centre at Vincenzo al Volturno in Italy is quoted as an example where evidence of production in the relevant time period is attested archaeologically.

They also suggest that the brooches were actively acquired by their wearers. This is based on a documentary reference to donations made by various Frisian men to the abbeys at Fulda and Warden; Roxburgh *et al.* (2014) believe that they might have received brooches from the abbeys in acknowledgement of their faith and support. In addition, Frisian traders visited periodic markets, for example those associated with cult places, from which they returned with brooches as part of their merchandise. Based on this, Roxburgh *et al.* (2014, 128–129) suggest that the brooches with overt Christian symbols, produced in religious environments, were sought-after material attributes to the Frisian population, underlining their commitment to the Christian faith.

Another possible explanation for their distribution is missionary activity, whereby the brooches with Christian signs were only actively pursued after they were introduced by missionaries coming from the south. During the early production period of this type of brooches, the northern Netherlands were frequently subject to missionary activity. Liudger (742/743–809), a Frisian missionary and bishop of Münster with strong connections to Utrecht, reportedly completed the Christianisation of the north (Van der Pol 2015, 45), although it is unlikely that all the inhabitants were by then true Christians. It can be imagined that the brooches became distributed alongside several missionary campaigns at first and more ‘instructive missions’ thereafter.

It goes too far to explore this facet of history here in detail, but it is already clear that the distribution mechanisms of mass produced brooches from the eighth to tenth centuries are complicated and in all probability multi-faceted. Weetch (2014), for example, suggests

that the brooches are especially female items. The relationship between such social identities and brooches provides other perspectives on their underlying distribution mechanisms. These 'multiple identities' – of which religion was only one – require large numbers of finds, to reveal not only general patterns, but also more specific developments at smaller scales.

In terms of their spatial distribution within the landscape, Frick (1992–1993) and Wamers (1994) provided the main typological works and related distribution maps of these brooches on a European scale. The PAN project adds to this on a Dutch scale. The general distribution patterns in PAN point to two main areas of finds concentrations in the Netherlands: the northern coastal area with the largest concentration, and the central Dutch river area with the second largest area of finds (Figs 4 and 5). These were also recognised by Frick and Wamers.

The finds in the other areas seem to concentrate in the vicinity of significant waterways of which the river Meuse in the southern Netherlands and the river IJssel in between the central Dutch river area and the north stand out. One can see a line of find concentrations from the south to the north along the main waterways (Fig. 4); from the south along the river Meuse to the central Dutch river area from which there is a connection with the north through the river IJssel and perhaps the IJsselmeer, the lake in which this river ends. The IJsselmeer coast of the Dutch province of Friesland shows a relatively high concentration of finds, which might indeed indicate that the brooches reached the northern coastal area via this water route.

There was thus clearly a riverine transportation of the brooches, but it is remarkable that their distribution did not reach the areas at a larger distance from the rivers (assuming that the distribution pattern is representative). It also remains to be questioned whether (some of) the brooches along the western and also the northern coastal area could have been brought there from overseas. Since a find concentration of brooches was observed in Mainz, Germany (Frick 1992–1993, 267; Wamers 1994, 50–68), it seems plausible that the brooches in the Dutch river area arrived there through transportation over the river Rhine. It is possible that some also arrived by transportation over the river Meuse (for example from production centres in present-day Belgium and France). The concentrations along the river IJssel (Fig. 4) furthermore indicate that this was the main route by which a connection was made between the central Dutch river area and the northern areas.

Can all this tell us anything about who was the driving force behind this exchange of brooches? In what ways and how actively the inhabitants of the northern and central river areas were involved in the distribution of brooches is not a question to be answered here, but the higher numbers of finds in the North indicates that these inhabitants maintained a more intensive connection to this distribution system than others in the Netherlands at that time. This might suggest that these brooches played an active role in the Christianisation process: it is after all likely that the inhabitants of the central Dutch river area, existing more centrally within the Frankish realm, were already further ahead in the Christianisation process than their northern contemporaries.

A possible driving force for their distribution northwards could be the Bishop of Utrecht. Utrecht, located relatively close to the finds concentrations in the central Dutch river area, was a basis from which missionary activities were initiated already from the seventh century, a function it had again during Boniface's life and for some time thereafter (Wood 2001, 41, 57, 100). In this case, the Dutch river area may have been a redistribution area from where the brooches were distributed by rivers in western and southern direction.

Thus the distribution of brooches in the PAN dataset can be argued to fit well within existing narratives about Christianisation, but it is hoped that with time, the expanding dataset will also contribute to the understanding of specific local developments – such as the organisation of production and distribution – and the significance of other aspects of social identities that existed at the time of Christianisation. Here, the variety of defined types or variants may offer additional insights. The occurrence of a large group of brooches with similar crosses is remarkable, as is the high number of related variants with different crosses in much smaller quantities.

The distribution patterns for the Netherlands are not yet completed, nor are they for the countries around the Netherlands (see Weetch 2014, 206 for comments on the available distribution patterns and the hiatuses within them), but it is clear that the patterns that can be derived from the PAN database make a significant contribution to international research focusing on supra-national exchange mechanisms. It is hoped that new recorded finds and the expansion of current distribution patterns can shed more light on the situation and make a contribution to research on an international level, in particular the relation between the area that is now the Netherlands and areas further inland as well as across the North Sea, including Britain and Ireland.

Concluding remarks

The PAN project is successful in establishing links with an expanding community of reporting metal detector users. Since 2016, this has already resulted in more than 30,000 reported finds of which nearly 9,000 are now published online and related to one of the reference types. However, the community of metal detectorists is large and it is one of the major challenges of the project to get in contact with most of them, and to encourage them to report their finds. Moreover, establishing links with the metal detectorist community should be seen as an on-going process, requiring continuation after the first PAN project term ends.

A long-term collaboration with metal detectorists is not firmly secured yet, and this is one of the project's main concerns for which solutions are now sought. The reference collection is still under construction, but it already proved to be an innovation with many advantages. Once a reference type is defined and described, related finds can be published online directly after being recorded. The reference types also enable the creation of several lists and distribution maps. The example of the enamelled/sunken field brooches showed that interesting patterns can already be observed. They underline the patterns known from previous research, but

also reveal new find locations. The defined variability of types might offer several possibilities to study the particularities within the broader patterns.

The PAN distribution maps of finds from the Netherlands, however, cannot be interpreted in isolation but need to be understood in the larger framework of finds from Europe. The recent establishment of The European Public Finds Recording Network promises an extended international dataset of detectorists finds to become available in the future, which will be easily accessible for international research programmes but also others whom might be interested.

Please visit www.portable-antiquities.nl for more information.

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