The Portable Antiquities of the Netherlands

A Review

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OVERVIEW

The Portable Antiquities of the Netherlands (PAN) is an online system aimed at recording and documenting archaeological finds by the public. Since PAN launched in 2016, it has become an important data contributor to Dutch archaeology, amassing over 100,000 recorded finds. These data, mostly the result of metal detection, enable scholars to gain new insights and policy makers to make more informed decisions. This review describes the context in which PAN was established, along with its current structure and scope, before looking at its different components, including the underlying database and linked data reference collection. In a final section, the article briefly addresses some common issues inherent to public reporting programs and how PAN approaches these issues.

Keywords: crowdsourcing, citizen science, documentation, Netherlands, portable antiquities

BACKGROUND, ORIGINS, FRAMEWORK

In 1997, the Portable Antiquities Recording Scheme (PAS) pilot project was launched in England, the first example of a recording and determination program for occasional finds of archaeological artifacts by the public (https://finds.org.uk). PAS is run by the British Museum, which, as a nondepartmental public body, is not directly managed by an executive government department but still receives government funding and is accountable to Parliament. The impetus for founding the project was the Treasure Act of 1996, which had just come into effect. Although the Treasure Act defined what qualified as treasure, including the legal obligations issuing from that qualification, it provided no legal framework for nontreasure archaeological artifacts. At the same time, the proportion of archaeological finds not qualifying as treasures was increasing due to the proliferation of metal detecting by amateur archaeologists (Addyman 2009:51). Therefore, standard documentation protocols or practices were nonexistent, and the scientific potential—whether at the individual artifact level or as aggregated data—remained underexploited. This coincided with a generally increased interest by scholars, including archaeologists, in the potential of participatory citizen science and crowdsourcing for generating big data (Smith 2014).

Other countries faced similar challenges and adopted similar systems in response, including the Netherlands.[1] The Portable Antiquities of the Netherlands project (https://www.portable-antiquities.nl) was established in 2016 after the Heritage Act legalized metal detection and consequently created a need for finds documentation (Vos et al. 2018:14). PAN was developed by the Vrije Universiteit Amsterdam and various other partners.[2] Previously maintained by the Cultural Heritage Agency and supported by the Dutch Research Council, it was transferred in March 2022 to the ArcheoHotspots Foundation (https://archeohotspots.nl). ArchaeoHotspots is housed in the National Museum of Antiquities in Leiden and is now funded by the Dutch Ministry of Education, Culture, and Science (Heeren et al. 2022:19, 136). As of 2022, its staff consists of a project manager, three find specialists (who assist in artifact identification), and six (inter)provincial registrars (who document the artifacts). However, PAN is not merely a citizen science project. It operates as the nexus of a larger expert network connecting universities, museums, public institutions, public–private organizations and amateur associations as well as similar digital documentation initiatives abroad through PAN's membership of the European Public Finds Recording Network (EPFRN). PAN aims not only to facilitate the documentation of newly found artifacts as well as those in historic collections but also to expedite research on the resulting data. Apart from its overt academic objectives, PAN aims to stimulate public outreach by bringing amateurs, scholars, and public heritage services together and by rendering archaeological data publicly accessible.

Since its inception in 2016 and through May 2022, PAN has amassed over 100,000 reported finds[3] in more than 60,000 records, and up to 7,000 active metal detectorists (Portable Antiquities of the Netherlands 2021:1). Moreover, the number of publicly reported archaeological finds in the Netherlands has more than doubled in the first five years of operation (Heeren et al.

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2022:18–19). This success is noteworthy, for instance, when compared with the neighboring Belgian region of Flanders. Like the Netherlands, Flanders (in Belgium, heritage is a competence devolved to its regional constituents) legalized metal detection when it implemented the Immovable Heritage Decree and Immovable Heritage Order, which took effect in 2016—the same year as the Dutch Heritage Act. Also similar to the Netherlands, accredited metal detectorists are legally obliged to report archaeologically relevant finds to the Flanders Heritage Agency, preferably through a web application developed specifically for that purpose. Even when considering the difference in size[4] and accounting for the divergence in counting methodology (for the Flanders Heritage Agency, a single find can be an individual object as well as an assemblage, whereas PAN differentiates between the two), the quantity of recorded finds at PAN exceedingly outnumbers registered finds in Flanders, by a factor of 7.5.[5]

One reason for this may be that PAN is more permissive, allowing the documentation of finds discovered prior to the current legislation. In Flanders, officially reporting metal-detection finds made before 2016 is impossible because metal detection was illegal then. Although the differences in property law will also play a role,[6] this observation appears to corroborate the theory that more permissive programs tend to yield better results (Deckers et al. 2018: 329). Finally, the success of PAN should not only be measured in terms of data supply but also in how the amassed data translates to new scientific insights and output, as exemplified in the anthology of five years of PAN, which is presented in Heeren et al. (2022:21–131).

WEB AND MOBILE APPLICATIONS

PAN's main public interface is a dynamic web application, developed with the programming frameworks AngularJS, Bootstrap, and Spring (Vos et al. 2018:16), the contents of which are available in both Dutch and English. The website caters to two main visitor profiles: (1) general visitors, who can access and/or query the publicly available information; and (2) authorized users (e.g., metal detectorists, researchers), who require a log-in so that they can report finds and access publicly restricted data. The home page features links, a reel of recent remarkable finds, and a set of 12 cards that link to the main subpages. It also advertises the logos of the project institution, main supporters, web awards, and a privacy disclaimer.

The privacy policy mentions that visitor data are processed by Google Analytics. However common its use, Google Analytics has recently been the subject of controversy (Winklbauer and Horner 2022), and the Dutch Data Protection Authority has since issued a warning that the use of Google Analytics may be disallowed.[7] The privacy statement page also details the copyright for the PAN website content, which basically entails a Creative Commons 4 license for general users, with additional limitations for restricted content accessible only for registered users.

The site offers free downloadable documentation: a flyer, a brochure, a summary of metal- detecting regulations, and a restricted content access request form for researchers. Although all downloadable documents are available in Dutch and English, the version is not selectable, but it changes with selected website language. It would be interesting to see a regularly updated account of sorts here, such as an infographic or a succinct annual report (akin to the Portable Antiquities Scheme annual reports). At the moment, some of this information appears disaggregated in the brochure or news feed, or in the recent glossy publication on five years of PAN (Heeren et al. 2022). This publication, however, is more elaborate than a mere report and only available through purchase. Given that PAN was established (and is still operated) largely with public funding, it raises the question of whether it should not offer a free and publicly accessible report too.

The news link directs visitors to the PAN Facebook page, which it uses as its sole news outlet. Social media presence is indispensable these days, and using platforms such as Facebook only as news feed can be justifiable from an economical point of view because it saves development, maintenance, and server costs. Moreover, Facebook algorithms will help spread published posts, reducing the need for active marketing or communication. Nonetheless, reliance on popular third-party service providers also comes with lack of operational and developmental control. Moreover, like Google Analytics, Facebook has been accused of unlawful data transfers (Aktipis and Katwan 2021:53–55), and in recent years, it saw its public image tarnished by ethical and moral concerns (Lauer 2021).

PAN's mobile application was launched in July 2020. It is supported by virtually all current operating systems, with the exception of iOS versions older than iOS 13, and infrequent users operating on iOS risk losing the overview of their own reported finds. Contrasting with the bilingual PAN website, the mobile application is only available in Dutch. The relatively minimalistic visual setup is clearly designed from a functional point of view, where information is secondary to practical usability (Figure 1). Reporting a find with the app is straightforward and minimally requires a short description of the find and its topographical coordinates, which can either be manually entered in the text fields by clicking a location on the map, or by allowing the mobile device to automatically determine its location through its GPS functionality, if enabled. There is an optional remarks field and the possibility to upload an image. The mobile app excels in user-friendliness and efficiency, requiring minimal effort and time. It is possible to operate the app offline, which is important, for instance, when reporting from areas with inadequate network coverage. Users can also report artifacts without being logged into the app—although without logging in, it is impossible to finalize the process, and the resultant provisional report is insufficient to comply with the legal obligations of the Heritage Act.

Users can report finds either using the web application or the more suitable mobile version. Unregistered visitors will see a QR code that installs the PAN app, assisted by an optional application manual. The reporting page is also where the PAN team members are presented. By concentrating all relevant contact information on the reporting page, it acts as a portal page for the find-reporting user. Logged-in users are able to consult an overview of their own reported finds and can easily add finds to previously recorded locations; specific types of user authorization will grant access to otherwise restricted data.

DATABASE AND REFERENCE COLLECTION

Arguably, the essence of PAN is its freely accessible records database (authorized users can access the same data but in more

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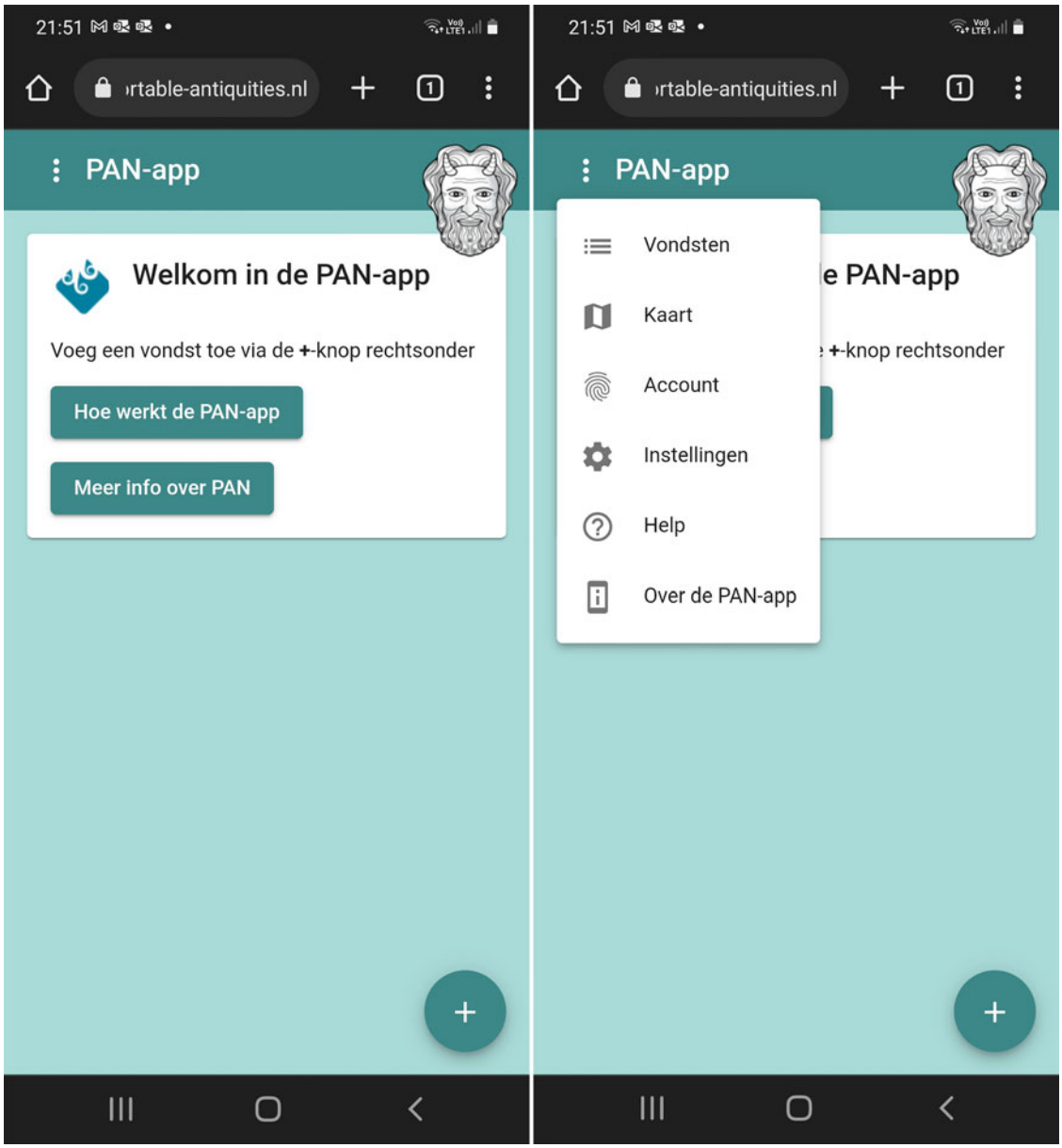

FIGURE 1. The PAN mobile app main page (left), with main menu opened (right). Note the minimalistic interface design facilitating field reporting with menu options spatially separated from the isolated "add find button" at the bottom.

detail, such as exact find locations), which complies with the findable and accessibility tenets of the FAIR (findable, accessible, interoperable, and reusable) digital data management guiding principles (Heeren et al. 2022:17). Users can either look for finds or assemblages by entering a specific find ID or by applying a range of filters. In fact, most of the cards on the PAN homepage simply link to preset search results. Filtering can be done on the basis of material characteristics, date, find location, soil type, assemblage, retrieval method, or finds ticked as "remarkable" (Figure 2).

The results of searches or filter choices appear in an overview, each with a thumbnail image, record ID, functional category, and object definition. The results section also features a zoomable density map of the Netherlands that indicates the number of finds per municipality. When no filters are applied, the map interface will show the number of finds per municipality or per sea grid square. These are clickable and have the same effect as selecting the respective municipality in the filter section. Authorized users can see point locations of finds (rather than municipality border outlines) and consult finds of any area by drawing a polygon on the map.

Each entry features one or more images and a standard set of data: general information, dimensions, material, ownership type, and optionally added information—such as inventory number, (estimated) year of discovery, or Archis[8] link. A record entry also features a find determination section, which builds on the PAN

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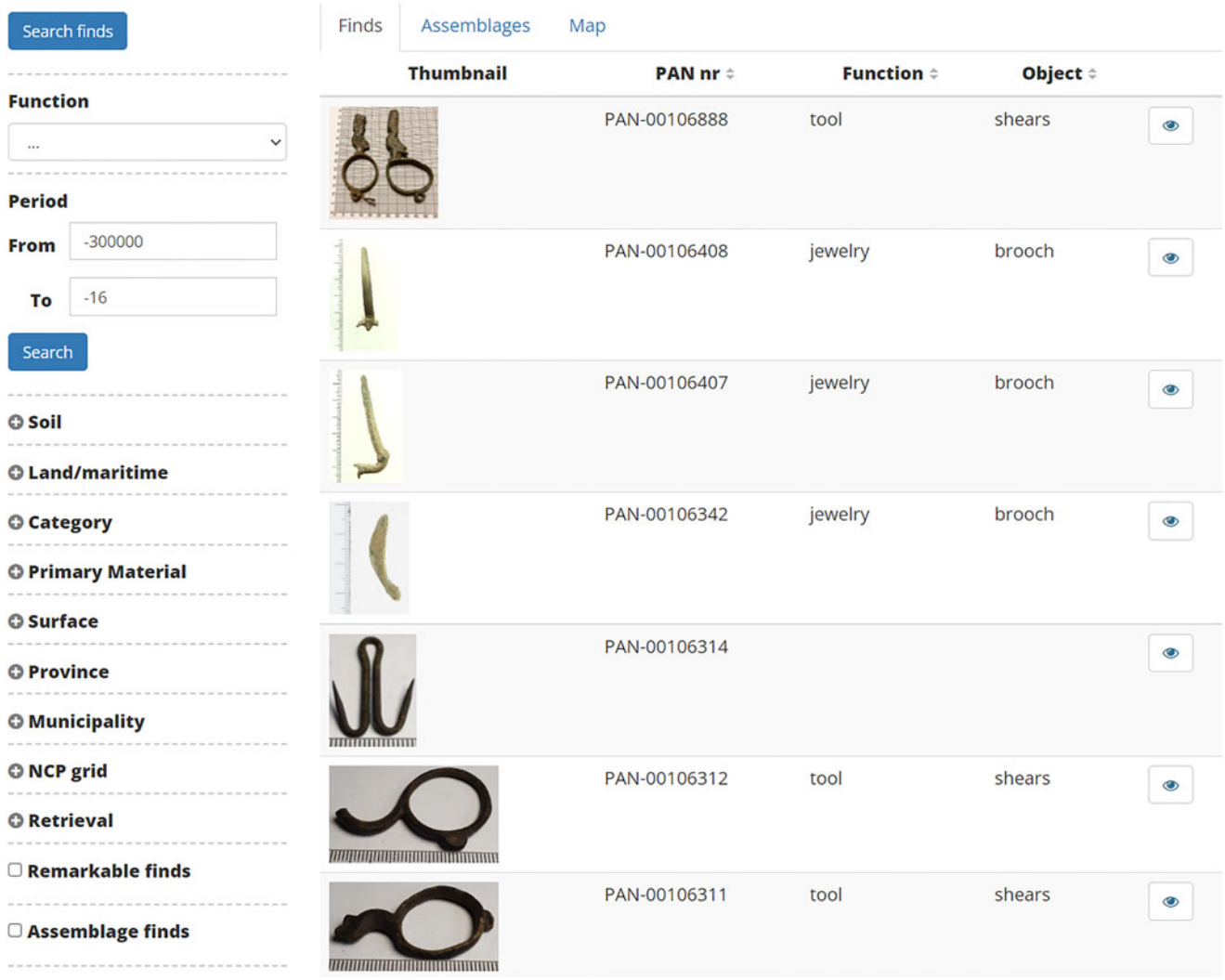

FIGURE 2. The PAN finds database. Note the range of filters on the left, and the results section on the right. Detailed information appears when clicking the eye icon. The results section can be changed to show only find assemblages or present the overview as a map interface.

reference collection (see below). Assemblage entries have an overall similar structure but come with a description section, include more dating information—such as a terminus post quem date based on the youngest component find—and an overview of the finds that make up the assemblage.

The PAN reference collection consists of a collapsible classification tree, guiding the inquirer from generic object type to specific subtype (Figure 3). Each level includes standardized information, such as name, function, date, PAN reference code, drawings, related publications, et cetera. The reference collection is built with PoolParty, a semantic technology platform. The PAN reference type code connects to the linked data server, which houses the vocabularies used by PAN. Once a find is validated and receives a PAN reference type, the PoolParty REST API communicates linked information to the designated text fields of the PAN database (Vos et al. 2018:19). This linked data architecture complies with the interoperable tenet of the FAIR standard for digital data (Heeren et al. 2022:17).

PAN AND COMMON PUBLIC REPORTING ISSUES

Reporting and documentation systems for archaeological finds by amateurs often draw fierce debate between proponents of the liberal approach (Deckers et al. 2018) and those who favor more restrictive policies (Hardy 2017). Avid metal-detecting amateurs often possess superior operational skill in locating metal finds in comparison to those of a qualified archaeologist. On the other hand, the methodical approach and expert knowledge of archaeology graduates often yield a better scientific return (Petrosyan et al. 2021). Initiatives such as PAN and similar projects in other countries aim to synergize the knowledge production potential of both actors.

Although reported finds are identified and recorded by educated and qualified personnel adhering to the ethical and deontological standards common to archaeology, the same conduct cannot

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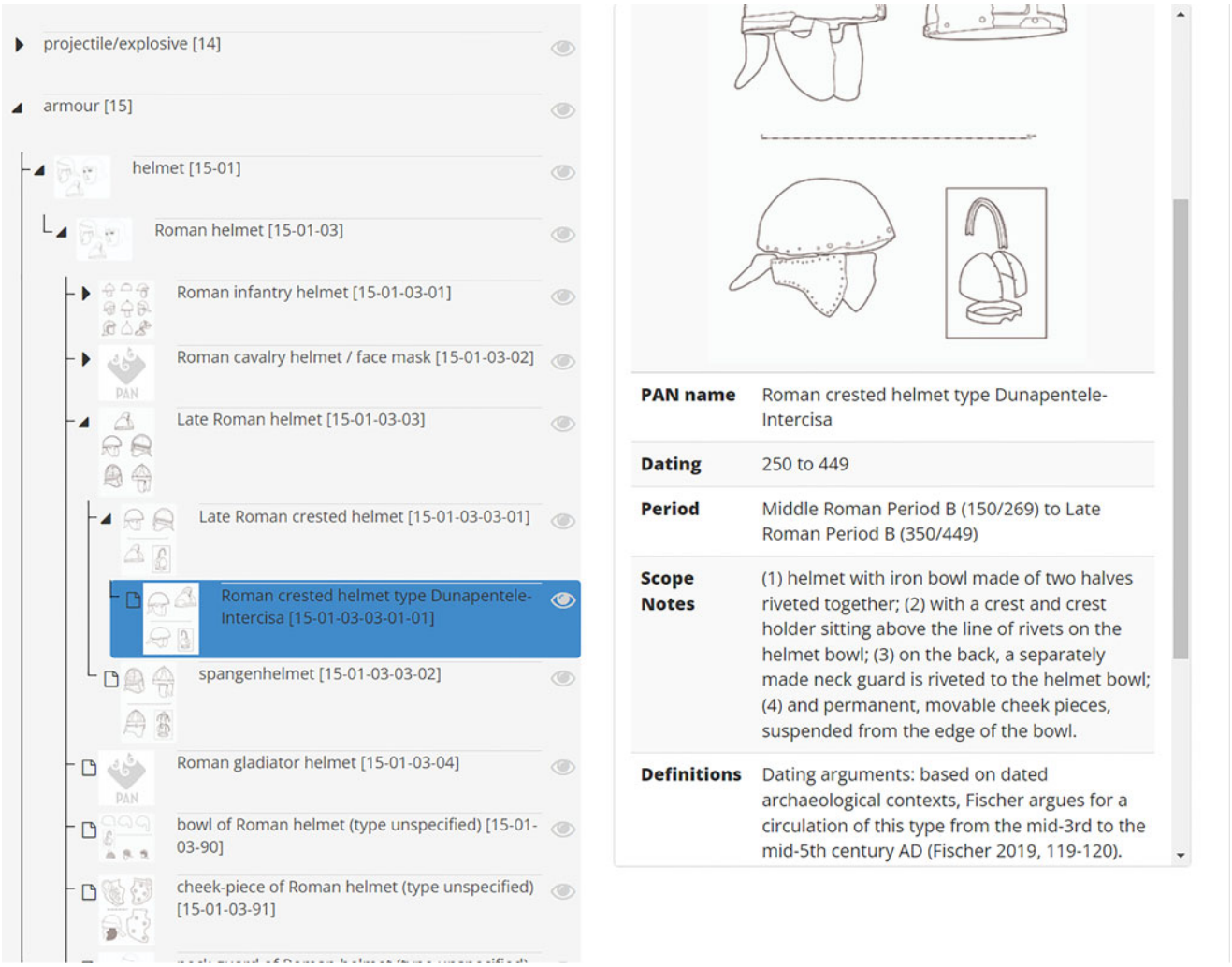

FIGURE 3. The PAN reference collection: an example of a Late Roman crested helmet of the Dunapentele-Intercisa type. Note collapsible classification tree-like folder structure to the left, which leads users from generic categories to specific types, and the information section on the right.

necessarily be expected from amateurs or hobbyists without formal training. In the neighboring Belgian region of Flanders, the number of reported finds has been contrasting starkly with the number of accredited metal detectorists (De Groote and Ribbens 2021:28–29). However, a 2018 survey by the Flanders Heritage Agency suggests that this may, at least in part, be due to variable activity rates among accredited metal detectorists (Carpentier 2018). In 2020, a particularly high-profile case in Flanders involved a botched attempt to launder illegally excavated coins from France through the official metal-detection finds reporting application.[9] Even though it ought to be noted that Flanders Heritage Agency experts involved in the identification of the reported hoard were crucial in spotting the attempted fraud, the find was highly idiosyncratic (i.e., 13,000 Roman coins). Fraudulent reports of less suspicious finds may very well pass unnoticed.

Given that the overall majority of PAN records results from metal-detecting activities, another hazard entails unexploded military ordnance. Certain areas in the Netherlands witnessed intense bombing or fighting during the Second World War. The unskilled handling of unexploded ammunition is potentially dangerous and poses a risk to not only the metal detectorist but also bystanders, infrastructure, and the environment. Because of these risks, several Dutch municipalities have issued local decrees outlawing metal detection partially or completely (Portable Antiquities of the Netherlands 2021:21–31). PAN addresses these issues by providing information: both the website and the downloadable information brochure go into the procedural steps one needs to follow to report finds, when finding live ammunition, and when encountering human remains. However, neither the website nor the brochure explicitly mentions how PAN deals with evidence of fraudulent reporting or the inappropriate handling of ammunition or human remains. This may be a deliberate choice: PAN may consider these issues out of its scope or already clearly defined by the relevant legislation. Moreover, given that the philosophy of PAN aims to overcome the traditional distrust between archaeology professionals and archaeology amateurs, it may feel that accentuating such sensitive topics is counterproductive toward its core objectives (for more discussion on archaeologists' relations with the public, see Snyder [2022] and Emmitt [2022]).

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CONCLUSIONS

PAN is a well-constructed, user-friendly platform because both the web and mobile applications offer intuitive and visually attractive front-end interfaces to their users. The web application is clearly designed to attract both a lay and (semi)professional public, and the mobile app mostly accommodates frequent reporters. The general appeal of the PAN philosophy and user interface has resulted in an increasing popularity that has led to a significant number of recorded finds since its launch in 2016.

The apparent simplicity of the apps is a credit to their accessibility and hides the underlying complex and extensive database. This database, built and managed according to the FAIR standards and managed through a linked data reference system, holds substantial scientific potential. The linked data information structure greatly facilitates data input and management, which—together with the extensive network of partners and volunteers—enables PAN to be run by a modestly sized team.

Although there are some data hygiene issues, such as multiple identical categories, the overall data appear solid and comprehensive. Any new scientific insights on certain artifact (sub)types can be immediately and thoroughly updated in the database through the linked data reference collection. The dataset could also form a solid basis for future potential experiments in machine learning (Bickler 2021).

For some of its functionalities, the dependency on third-party providers raises questions about its future-proofing. In the short to medium term, however, these are minor issues, given that the technical, commercial, and financial justifications to use them are equally apparent. Another issue is that PAN is unclear on its policy toward fraudulent find reporting or reports that indicate improper handling of unexploded ordnance or human remains. Even though it may consider these problems marginal and its coverage counterproductive to its aims, PAN—as an established and influential medium—could perhaps be more candid about its position on these issues.

Despite these concerns, the PAN project is an example of a performant and successful documentation system for archaeological finds by the general public. Its benefits to amateurs, academics, professionals, and heritage in general, are already clear and will likely be reaffirmed in the coming years.

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NOTES

1. Similar initiatives can be found in Belgium (through the official reporting application of the Flanders Heritage Agency or MEDEA in Flanders, and through the citizen web portal in Wallonia), Denmark (Digitale Metaldetektorfund [DIME]), and Finland (Löytösampo).
2. The initial project was a collaborative effort headed by the Vrije Universiteit Amsterdam, supported by the Cultural Heritage Agency, Leiden University, and the University of Groningen. Other partners include the Numismatisch Informatie Systeem (NUMIS), managed by De Nederlandsche Bank, Radboud University, various metal detectorist and amateur archaeology associations and organizations, museums, depots, foundations, and local governments.
3. https://www.facebook.com/PortableAntiquitiesNetherlands/.
4. The Netherlands currently has a total population of approximately 17.6 million (source: https://www.cbs.nl/nl-nl/visualisaties/dashboard-bevolking) and a total surface area of 41,543 km² (source: https://opendata.cbs.nl/statline/#/CBS/nl/dataset/70262ned/table?fromstatweb), whereas Flanders currently has a total population of around 6.6 million and a total surface area of 13,522 km² (source: https://www.vlaanderen.be/cultuur-sport-en-vrije-tijd/toerisme/ontdek-vlaanderen).
5. At the time of writing, PAN metal-detection records numbered over 60,000, whereas the total number of metal-detection finds at the Flanders Heritage Agency was slightly below 8,000.
6. According to Belgian property law, ownership of metal-detection finds remains solely with the plot owner, whereas in the Netherlands, finds become the property of the metal detectorist (unless the find qualifies as "treasure," at which point ownership becomes equally shared between metal detectorist and owner).
7. See https://autoriteitpersoonsgegevens.nl/nl/onderwerpen/internet-telefoon-tv-en-post/cookies#hoe-kan-ik-bij-google-analytics-de-privacy-van-mijn-websitebezoekers-beschermen-4898.
8. Archis (Archeologisch Informatiesysteem [Archaeological Information System]) is the Dutch government database, in which information about archaeological research, finds, and monuments are registered.
9. https://www.vrt.be/vrtnws/en/2020/12/16/french-treasure-trove-finder-was-no-honest-joe/.

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