

Original Study

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“Professional Amateurs”. Metal Detecting and Metal Detectorists in Denmark

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Abstract: From the beginning of metal-detector based archaeology practiced by members of the public, the formal heritage sector in Denmark determined to pursue a liberal model based on cooperation and inclusion rather than confrontation and criminalization. Based on the findings of the ‘2015 Danish detectorists survey’ it is argued that Danish metal-detector archaeology has challenged the classic division of roles in archaeology and heritage management, and that at least a large proportion of Danish detectorists practice their hobby adhering to the highest professional standards, which stand in sharp contrast to the often-cited stereotype of the detectorists as mere ‘treasure hunter’.

Keywords: metal-detector, heritage, databases, citizen science, Denmark

1 Introduction

In the early 1980s, the metal-detector revolutionized Danish archaeology. Nearly all of the spectacular and groundbreaking discoveries of the past decades, including many that appeared in the headlines of the national media, were made by amateur archaeologists using metal-detectors.

At the beginning of metal-detector archaeology in the late 1970s, the formal heritage sector determined to pursue a liberal model based on cooperation and inclusion rather than confrontation and criminalization (Olsen 1984; Petersen 1991). Since then, as in many countries, metal detecting has developed into a popular recreational hobby primarily practiced by non-professional/amateurs.

It is difficult to estimate the number of detectorists active in Denmark. Detectorists’ estimates vary from between roughly 1000 to 3000 more or less active users. The biggest Internet forum for metal detectorists, the online forum/database ‘detectingpeople.dk’ and the Facebook group ‘Detektor Danmark’ count respectively 2500 and 2777 members (in June 2016), of which not all practice detector surveying on a regular basis. At the same time, not all detectorists, especially not the more occasional user, can be expected to have joined the detectorists’ Internet community. A more accurate number can be obtained from the number of treasure-trove rewards paid to members of the public by the National Museum. In 2015 the Museum made treasure-trove payments to 197 individuals. Due to several years of processing delay, this number reflects the status around 2012, and based on the increase in the number of incoming finds in recent years the actual numbers are probably considerably higher. On the other hand, only a small fraction of a typical detector find assemblage is registered as Danefæ (a treasure-trove), and the 197 individuals represent the small group of highly active and committed detectorists. Taking account for all uncertainties, one can only

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guess that the number of detectorists practicing their hobby on a more regular basis can be estimated to somewhere between 1000 and 2000.

According to the Danish Consolidated Act on Museums (2006), the use of metal detectors is legal except on or within two meters of protected heritage monuments and sites. Finders are compensated for turning in finds to the Danish National Museum (in practice, finds are initially processed by local museums). Whether a find is declared as a treasure trove (“Danefæ” in Danish), and the compensation sum is determined by Danish National Museum staff based on consideration of the following factors: 1) the find’s metal value, 2) the find’s rarity and 3) the care taken by the finder during the find’s recovery. Between 2010 and 2014 7.5 million DKK (1.0 million Euros) in treasure-trove rewards were paid to individual metal detectorists, and in 2015 alone, this figure went up to a previously unseen amount of 4.23 million DKK (0.5 million Euros) (source: Danish National Museum: see table 1).

Table 1: Development of incoming finds and treasure trove finds (Treasure trove) at the Danish National Museum registered in the museum’s collection database/protocols. Because the numbers include all treasure trove, they include a small percentage of artifacts that were not found by detectorists. Data provided by Mads Schear Mikkelsen and Rikke Ruhe (the Danish National Museum).

	2010	2011	2012	2013	2014	2015
Incomming finds (total)	(no info)	(no info)	(no info)	5556	7176	9756
Treasure trove (Prehistoric and Medieval)	813	743	968	865	1495	1522
Treasure trove (Coins and Medals)	2066	2289	2786	3502	3817	1994
Treasure trove (total)	2879	3032	3772	4367	5312	3516
Total compensation paid by National Museum	1.3 mio. kr.	1.25 mio. kr.	0.9 mio. kr.	1.2 mio. kr.	3.0 mio. kr.	4.23 mio. kr.

Since the beginning of metal-detector archaeology, the number of finds by metal-detector surveys has increased tenfold and it appears that this tendency will continue in coming years (see fig. 1).

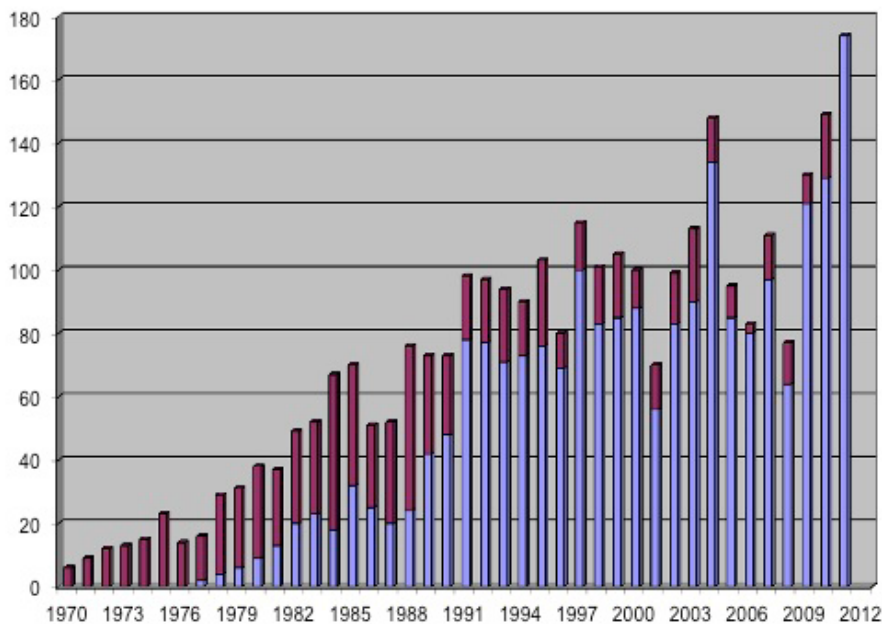


Figure 1: Increase in the number of findspots that have produced treasure trove finds discovered with (blue) or without (red) metal detectors in Denmark during the period 1970–2011. The substantial majority of the non-metal detector treasure trove finds are of stone, amber or glass (the decrease between 2006 and 2008 is explained by administrative issues and does not reflect actual circumstances). The Danish National Museum is unable to provide data for the time after 2011.

Source: Mogens Bo Henriksen, *Odense Bys Museer*, based on data from the Danish National Museum.

Only between 2010 and 2014, the total number of finds registered as treasure trove (Danefæ) by the separate collection departments at the Danish National Museum (Prehistory, Medieval and the Collection of Coins and Medals) increased from 2911 in 2010 to 4290 in 2013 and to 5312 in 2014. In 2015, a total of 9756 finds were sent to the three departments at the National Museum for treasure trove evaluation. As a result of this development, finds in certain artifact categories that 20 years ago were regarded as exceptional or even unique, now count in the hundreds today. Settlement sites from the Early Medieval period, which were limited to fewer than twenty localities in the late 1970s, today now account to several hundred individual sites.

Danish metal-detector archaeology receives considerable media attention. Press coverage is generally characterized by a very positive discourse, portraying the activities of amateur metal detectorists as a valuable contribution to the writing of Danish history.

Within the archaeological establishment (academia and the heritage sector), the Danish liberal model of metal detector archaeology is generally considered to be a success, and the majority of Danish archaeologists consider the positive effects of a liberal policy toward detector archaeology to outweigh the negative effects. According to museum staff experience, most practitioners exhibit a highly professional attitude toward their hobby and follow the basic rules of archaeological surveys. Most importantly, the majority of the practitioners abide by the treasure-trove regulations of museum law and hand over their finds to local museums (see fig. 2).



Figure 2: Bornholm 2001: The former non-professional detectorist Klaus Thorsen, an early promoter of metal-detector archaeology in Denmark, with representatives of Bornholms Museer and the Danish National Museum present Thorsen's recent find of a migration period hoard of Goldbracteates to the Danish Queen Margrethe II and the press. *Photograph: Bornholms Museum.*

In the professional sector, the prevailing arguments in favor of recovering detector finds from their plough-soil context (and to actively encouraging amateurs detectorists to do so) are as follows: 1) the finds have already been removed from the original context and 2) the danger of deterioration and ultimately destruction by factors such as construction and agricultural activity, acid rain, and chemical fertilizers (Henriksen 2005; Baastrup and Feveile 2013; Svensson 2014). Both amateur practitioners and archaeological professionals often emphasize the value of metal-detector finds as scientific data and a source of knowledge regarding the character and development of prehistoric and historic societies.

2 The Preconditions of the Liberal Model

Why has metal-detector archaeology in Denmark not become the problem it has developed into in many other countries? Official stakeholders of cultural-heritage management in Denmark did in fact express concerns during the early period of the practice and anticipated large-scale destruction of cultural heritage by treasure hunters (Fischer 1983; see also Nielsen and Petersen 1993). As we have argued elsewhere (Dobat 2013, 2016), why matters developed differently in Denmark is complex, and the success of the Danish model must be viewed as based on a complex interplay of legislative, historical, cultural, social and psychological aspects.

Since the beginning of metal-detector archaeology, the Treasure Act of the Danish Museum Law has played a crucial role (for general comments on the Museum law, see Axboe et al. 2010; Moesgård et al. 2010). The act has ensured that the majority of the many thousands of finds uncovered by amateur detectorists entered the inventory lists of local museums and the Danish National Museum. In addition, with its emphasis on the finder’s exercise of caution during recovery, the act has ensured that the recovered objects are accompanied by essential contextual data, such as find location and relationship to other finds.

The Treasure Act is implemented by the Danish National Museum in cooperation with the many local archaeological museums with archaeological departments and administrative responsibility for the archaeological heritage in a given district. For its size and population, Denmark has a relatively high number of archaeological museums (approximately thirty at present). This decentralized structure has been the basis of close interaction between museum staff and citizens, and the short distance from museums to the field in simple spatial terms has enabled the establishment of close bonds between professional staff and amateur metal detectorists. The close cooperation between detectorists and museums typically involves find identification and processing, forwarding finds to the Danish National Museum for the evaluation of the finder’s financial compensation, supplying information on potential find-spots and cartographic material, and instructing detectorists on the handling of finds and on documentation standards. Museums also support detectorists associations in the process of setting up large-scale detectorist rallies by pointing out potential survey areas and monitoring the events (including registering finds in the responsible museum’s collection). One must add the generally high level of trust between society and official institutions - a distinct and quantifiable feature that distinguishes Danish society from many other societies (Bjørnskov et al. 2011). Like other public institutions, archaeological museums profit from this attitude and are generally perceived as highly trustworthy.

However, the success of the liberal model cannot only be attributed to the financial incentive included in the legislative framework of the Treasure Act or the character of the Danish Museum landscape. Any attempt to answer this question must include a number of factors beyond the influence of legislative regulations and official stakeholders. One equally important factor is the character of typical Danish metal-detector assemblages and the regionally specific surveying parameters.

Most of the treasure trove registered at the Danish National Museum in recent decades consists of bronze, lead or silver artifacts, whereas gold objects only play a minor role (see fig. 3) (only approximately 1 percent of the finds for which compensation is paid under the *treasure trove* regulation are gold objects; pers. Comm. Peter Vang Petersen 2014). Although spectacularly valuable finds have occurred, they are rare, and for an individual detectorist, the compensation paid under the Danish treasure act rarely outweighs the investment of man-hours (particularly considering the average wage or the lowest social-security benefits in Denmark), which renders profit-motivated treasure hunting impractical.

Another important parameter is the contextual background of detector finds in Denmark. As in most European countries, nearly all treasure trove is found in the plough horizon of cultivated fields. Thus, the potential danger of metal finds being removed from their original contexts and the loss of irreplaceable information is low due to the nature of the typical Danish heritage site (see fig. 4).



Figure 3: Selection of bronze artifacts (dress accessories and other implements) from different periods (ranging from the Bronze Age to the Medieval period) found on sites around Kerteminde in northeastern Funen, Denmark. The collection is representative of an average assemblage of so-called *treasure trove*, i.e., finds for which financial compensation is paid to the finder by the state (length of the fibula button, right: 6,2 cm). Photograph: Østfyns Museer, Kerteminde, Denmark.

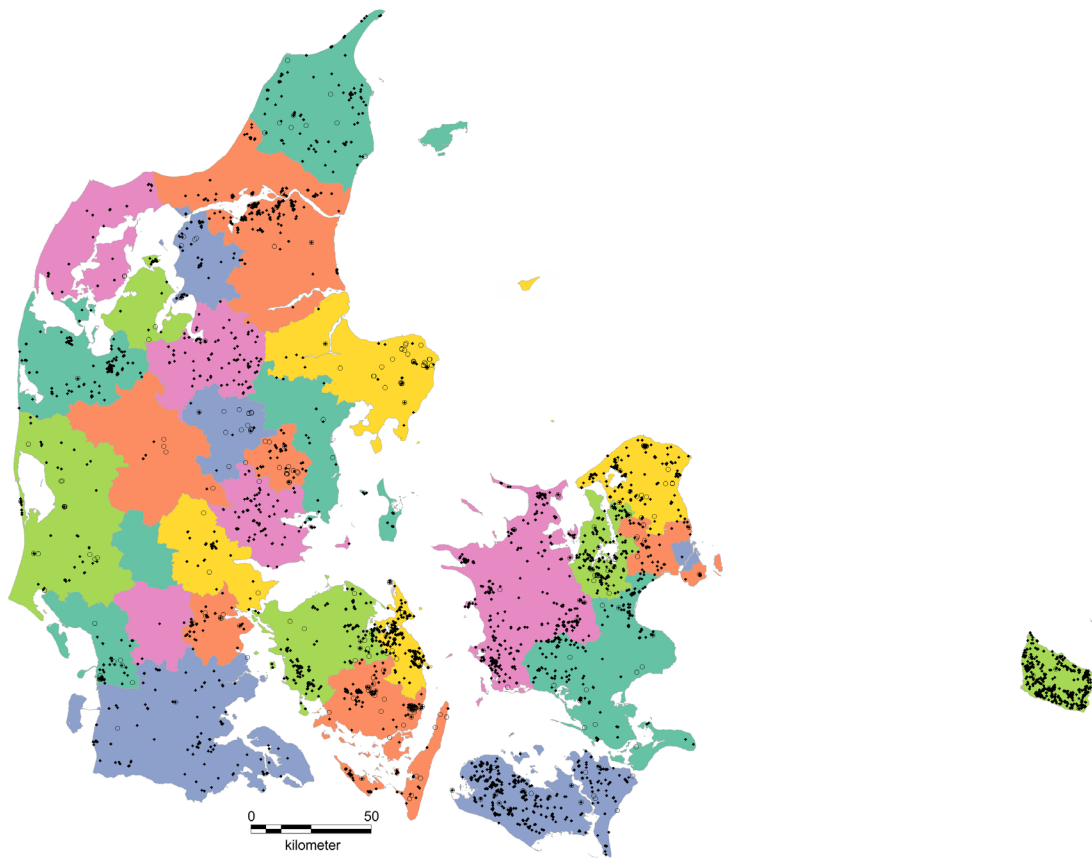


Figure 4: Distribution of findspots for *treasure trove* finds discovered with metal detectors in Denmark up to and including 2006. Data: Kulturstyrelsen; drawing by Mogens Bo Henriksen, Odense Bys Museer.

As non-professionals, Danish metal detectorists continue a long tradition of amateur archaeology in Denmark. Since the institutionalization of the heritage sector, the active participation and inclusion of often highly engaged amateurs in museum practice has been characteristic of Danish archaeology (Kristiansen 1981; Lyngbak 1993). Many detectorists are members of one or several local and national associations (e.g., the *Bornholmske Amatørarkæologer*, *Harja*, *Tellus* and *Thy-Mors Detektorforening*). These associations fulfill an important function as an institutional link between detectorists and museums or other research institutions, and they regularly cooperate with local museums and other research institutions in surveying projects or excavations. As the social and cultural context through which many novices are introduced to the field, they also contribute by shaping a positive culture and professional attitude toward metal detecting as a hobby and play an important educational role. For example, according to the statutes of *Thy-Mors Detektorforening*, individual members commit themselves “to abide by the treasure-trove regulations of the museum law” and “to find and conserve Danish cultural heritage as a resource to obtain further knowledge of Danish cultural history” (thymorsdetektor 2012). In this context, the various Internet platforms (e.g., <http://www.detectingpeople.dk/> 2012 and several detector-related groups on Facebook, e.g., Detector Danmark) also play a positive formative role, with the detector milieu itself shaping and promoting a professional, cooperative attitude.

Finally, like many other hobbyists, metal detectorists are partly motivated by a competitive spirit. As “trophy rooms”, the various Internet platforms used by detectorists to share experiences and finds serve to satisfy the human desire to share successes with peers or the public. The “trophy factor” is certainly one reason why metal detecting in Denmark has been characterized by transparency.

Key to understanding the generally high moral attitude of Danish metal detectorists and the perception of metal detecting as contributing to cultural history is the widespread and profound historical consciousness found in Danish society. Archaeological and historical journals or television programs are surprisingly popular, and there is a general acceptance of the relevance of the preservation of cultural heritage as a valuable and shared property. In the popular view, Danish prehistory is intimately linked with national sentiments and understood as a common ancestral past that forms an important source of national identity (see also Garrison 2009: 45).

Because a law is only as effective as moral attitudes regarding its scope, the actual metal-detector practitioners and the question of their incentive to engage in metal-detector surveys are key to the understanding of the liberal model’s success. Against this background, one could argue that the liberal model’s success is based on the fact that Danish metal detectorists seem to consider their work not only to be a contribution to cultural history in general but also as a way to contribute to the writing of Danish national history. Instead of passively consuming cultural heritage through the media or in museums, the metal-detector offers these citizens the possibility to actively produce cultural heritage and thus contribute to the common good. Thus, metal detecting has become more a source of social and cultural capital than one of economic income.

3 Mapping Attitudes: The ‘2015 Danish Detectorists Survey’

The attitudes of the metal detectorists is key to the understanding of why the liberal model has proven successful as a means to manage metal-detector archaeology in Denmark. In order to map the practices and attitudes of Danish metal detectorists, the authors distributed an online questionnaire to individual metal detectorists in 2015. The survey formed part of a development project, aiming at the design and implementation of a user driven, online recording scheme for metal detector finds in Denmark and the results were intended to feed into the scheme’s development. The questionnaire was spread via Facebook (group ‘*Detektor Danmark*’) and the various detectorists associations, resulting in a total of 168 individual responses. Consisting of 29 individual questions and additional commentary fields, the survey combined quantitative and qualitative data. It is the first survey of this kind to be conducted in Denmark, providing insights into practitioners’ attitudes.

Asked on their level of experience with metal detecting, a clear majority of 70% had been practicing metal detecting for more than two years, and while half of the respondents did spend at least 100 hours in

the field per year, 26% of them even invested between 500 and 1000 hours (equivalent to at least 14 working weeks) metal detecting per year. This high level of personal investment into the hobby is also expressed in the fact that 37% of the respondents had handed over between 100 and 500 objects for treasure trove evaluation to their responsible museums (a baffling 16% had even handed over more than 500 artifacts: see fig. 5).

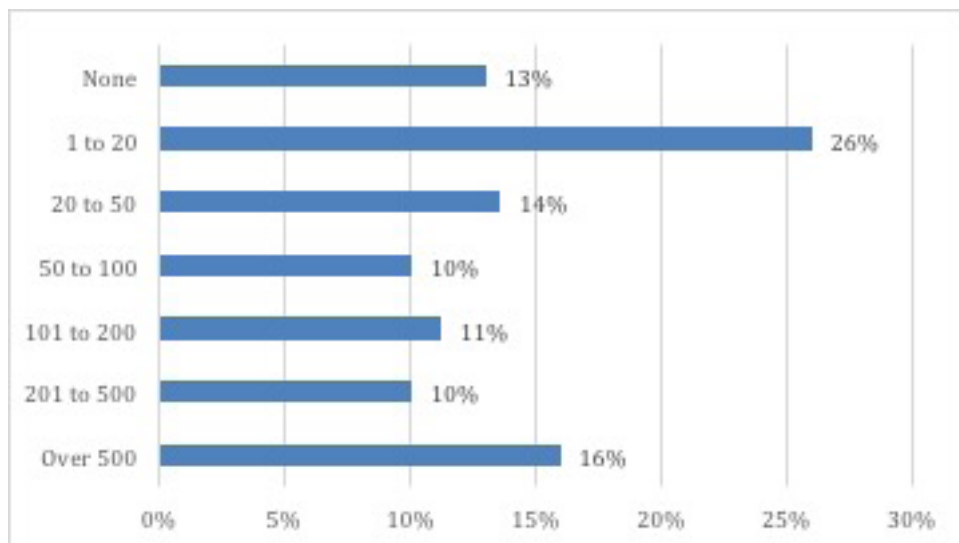
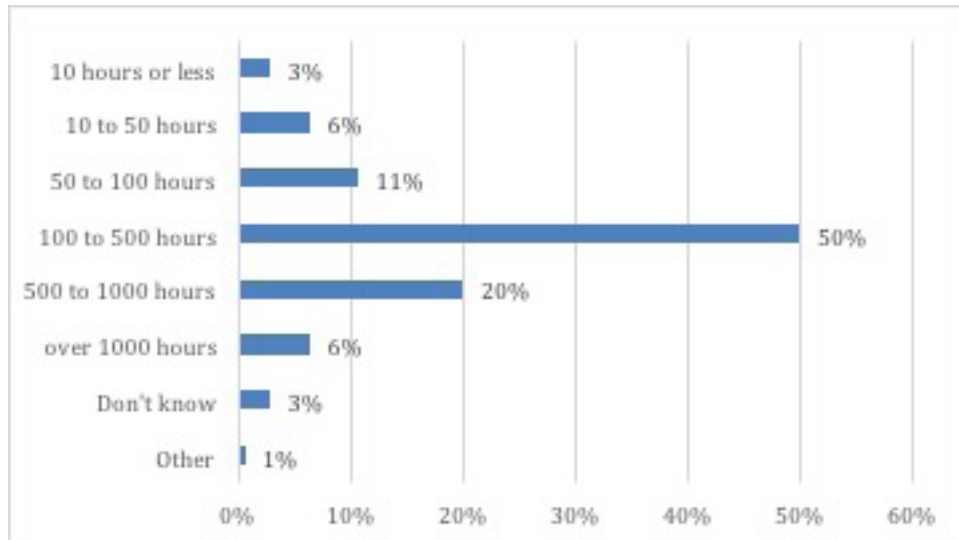


Figure 5: Results of the '2015 Danish detectorists survey'. Detectorists were asked how many hours they spend metal detecting on an annual basis (top) and how many finds they had handed over to a local museum in total (bottom).

The survey also attempted to address the detectorists' level of competence, through questions relating to the handling and the identification of find material. The clear majority stated that they hand over finds to museums together with detailed information and contextual data for each object; for example GPS coordinates (85.5%), a typological identification (64.8%), a unique ID (54.5%), a basic description (53.3%), a dating (29.7%) and even a report on the character of the find-spot and other possible archaeological observations (30.9%) (see fig. 6).

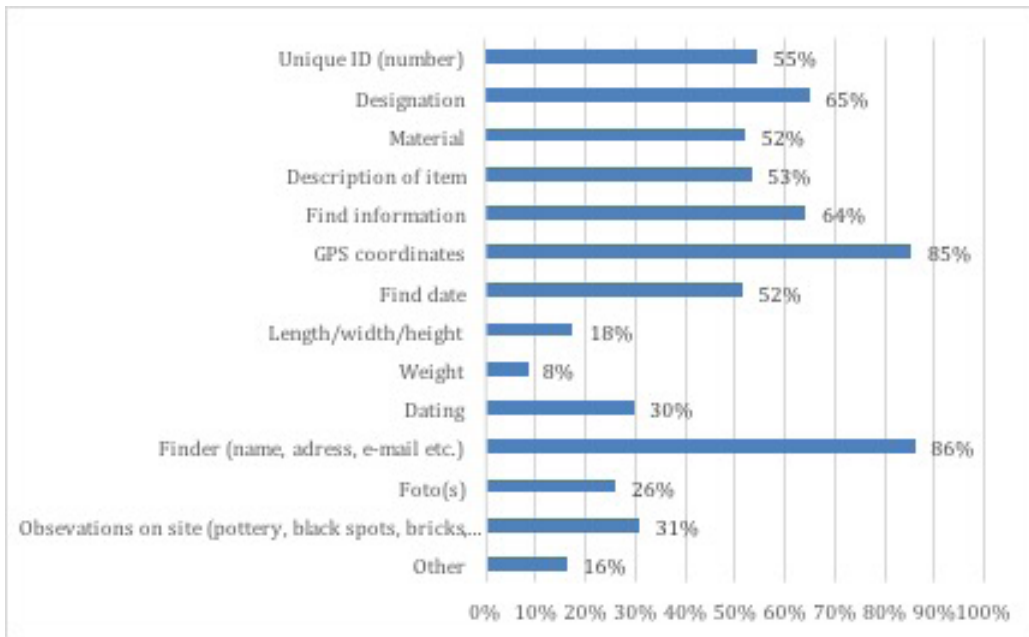


Figure 6: Results of the ‘2015 Danish detectorists survey’. Detectorists were asked which type of data they record and share with their respective local museums when handing over finds.

It is also noteworthy in this respect that only a small minority of 5% stated that they did not take photographs of their finds, whereas 88.6% of the respondents assessed their find pictures to be of very high (25.7%) or at least acceptable quality (62.9%).

The high level of integration of museums and metal detectorists is apparent in the answers to questions relating to cooperation with local museums, where 73.4% of the respondents evaluate this cooperation to be either ‘functioning very well’ (43.2%) or to ‘function well with room for improvements’ (30.2%). Only a minority was either neutral towards museum cooperation (12%) or felt that this cooperation did not function well (5%). Ironically, some respondents in the latter group commented that they in fact wanted more cooperation but blamed the museums for not wanting to cooperate with them or not appreciating their work. 71.6% of the respondents had either been involved in a museum’s excavation project or had participated in targeted surveys organized by the museum or a detectorists association in cooperation with a museum. Partly surprising was the result that 70.1% of the respondents would like to participate in the find registration process at museums (see fig. 7).

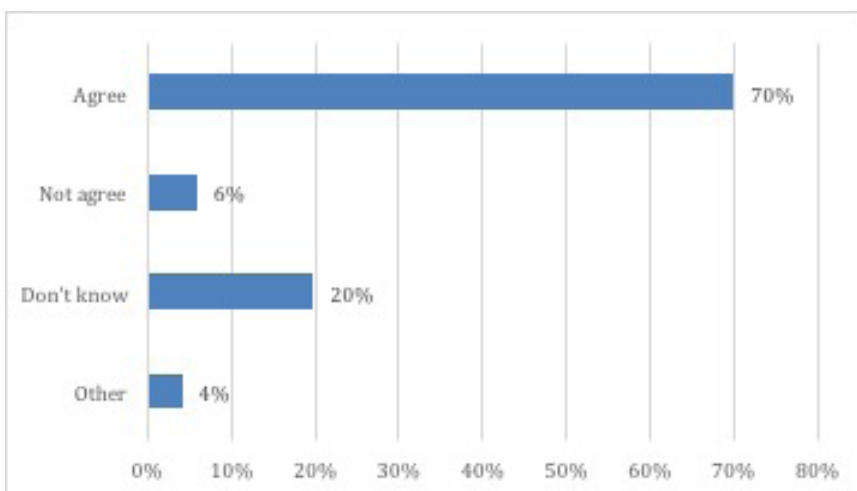


Figure 7: Results of the ‘2015 Danish detectorists survey’. Detectorists were asked to agree or disagree to the statement that it is important that detectorists can participate in the registration of their finds.

Probably the most notable output of the survey was the answer to questions on how much it meant for the respondents that finds and contextual data are more accessible to archaeologists and researchers, to which a total of 156 respondents (92.3%) replied that this would matter a lot (see fig. 8).

The clear majority of the respondents are inclined to share the results of their work, at least with ‘professional’ archaeologists. They seem to be a little less inclined to also share these data with the general public (though 79.8% agree that this important); and even less with fellow detectorists (only 57.1% consider this important and 18.5% directly oppose it: for more, see fig. 9).

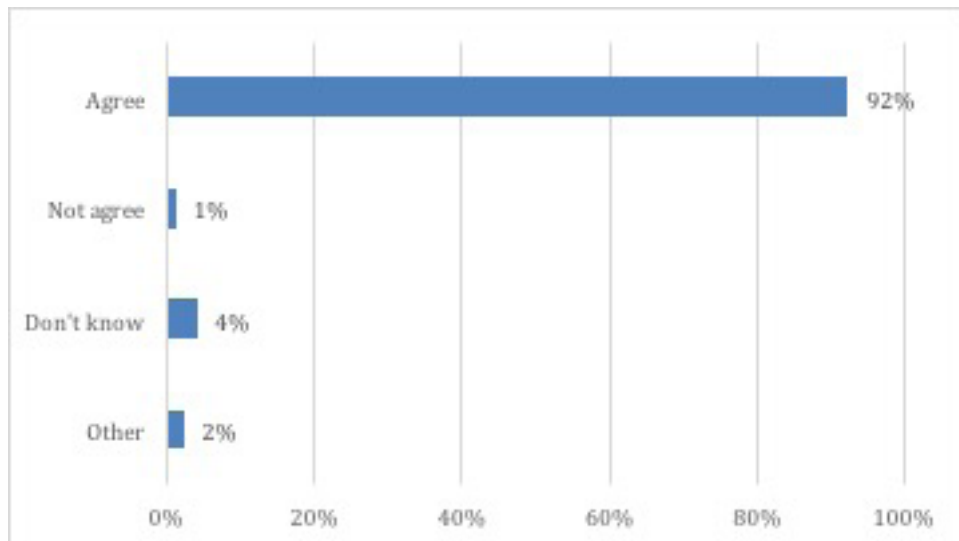


Figure 8: Results of the ‘2015 Danish detectorists survey’. Detectorists were asked to agree or disagree to the statement that it is important that finds and contextual data are accessible for archaeologists and researchers.

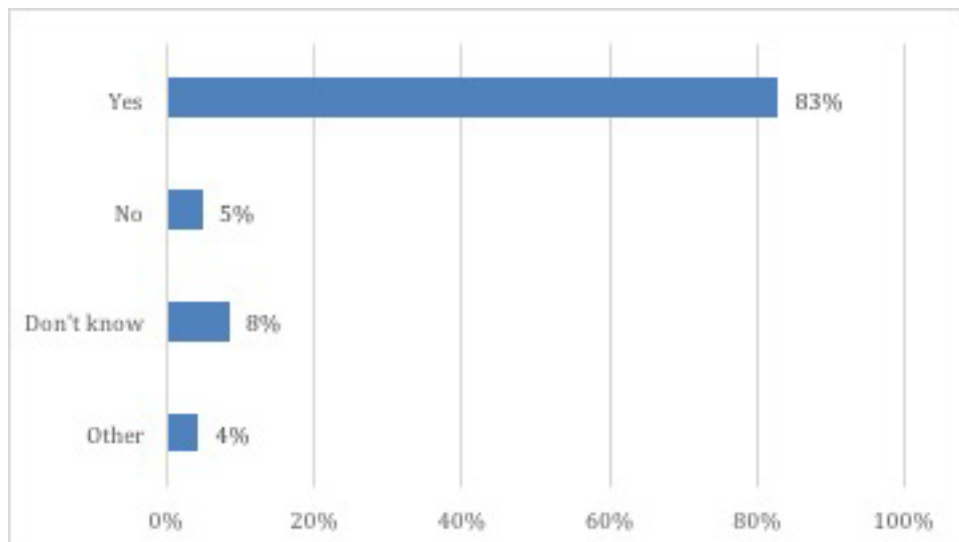


Figure 9: Results of the ‘2015 Danish detectorists survey’. Detectorists were asked whether they would be willing to upload finds in a publicly accessible online scheme (provided that exact findspots are hidden for members of the public and only accessible for archaeologists and researchers!).

With 168 respondents, the ‘2015 Danish detectorists survey’ is only representative sample of a small section of the Danish detectorists community. As argued for above, the number of active detector users in Denmark is difficult to assess. The number of treasure trove rewards paid in 2015 suggest a very small community, which is contrasted by the 2700 members in the Facebook group ‘Detektor Danmark’. Crucial for the survey’s source value is the fact that a majority of the respondents stated that they already had handed over finds to their local museum for treasure trove evaluation, suggesting that the survey is representative for a smaller group of highly active, committed (and successful) detectorists. The same is indicated by the fact that 71.6% of the respondents had been involved in a museum’s excavation or survey project.

Further biasing factors have to be taken into account. Those practitioners, who already are inclined to enter a dialogue with museums and professional archaeologists, could be heavily overrepresented in the pool of respondents. Another biasing factor is the fact that few practitioners, despite the questionnaire being anonymous, can be expected to make statements not reflecting the general moral consensus within the detector scene, or among museum professionals.

On this background, the survey results presumably reflect the prevailing attitudes among the rather small group of highly active (and hence experienced) detectorists in Denmark. This group’s moral attitudes and approaches to their hobby might very well differ from the large group of detectorists, who practice their hobby on a more occasional basis.

On the other hand, the attitudes reflected in the ‘2015 Danish detectorists survey’ echo the general tenor of debates among practitioners in the various communication forums on the internet and there is at least little reason to believe that the general attitude deviates significantly from the picture given above.

Thus with reservation regarding the biasing factors in the ‘2015 Danish detectorists survey’ highlights the positive and constructive attitude of Danish metal detectorists, who (at least according to the survey) are:

- Passionate and proficient
- Well-connected and organized among themselves via Internet forums for exchange
- Highly competent in recording relevant contextual data and the identification and dating of find material
- Willing to cooperate with the archaeological establishment
- Providing the archaeological establishment not only with finds but also with contextual information of high quality standards
- Eager to share finds and contextual data with museum professionals and researchers
- Willing to be actively involved in the find registration process at museums.

4 Downsides of the Danish Model

As in countries in which metal detecting is prohibited by law, negative cases seldom receive public attention. Therefore, the gravity of the problems related to metal detecting in Denmark is difficult to assess. However, it would be naïve to believe that, for example, “night-hawking” (i.e., illegal metal-detecting on registered heritage sites or without landowner consent) does not occur. In addition, we cannot exclude the possibility that metal-detector finds are not recorded or registered, rather they are offered for sale on the global market, where the monetary rewards may exceed the compensation paid under the Danish Treasure Act. However, generally, this compensation exceeds the potential market price, and only few cases of market selling have been reported (Henriksen 2011; P.V. Petersen, curator at the Danish National Museum, pers. comm. 2012). Thus, one can only postulate that the occasional loss of single finds or assemblages that are *not* handed over to museums but sold officially or on the black market is a cost of the Danish liberal model.

Despite the professional attitudes of the majority of metal detectorists, museum curators still observe unsatisfactory handling of finds and incomplete or completely missing information on find locations. Even though the ‘2015 Danish detectorists survey’ shows that 85.5% of the respondents do record GPS coordinates for each of their finds, this still leaves a significant part of the finds without exact geographical referencing. Because the amount of *treasure-trove* compensation and (perhaps more

important) the esteem enjoyed by the individual detectorist among the associations are highly dependent on the standard of the find handling, such cases are relatively rare although they do occur (for example, see Henriksen 2011).

A pressing issue continues to be the constant improvement of metal-detectors, which facilitates deeper ground penetration. Already today, several manufacturers offer devices with a search range that exceeds the average depth of the plough horizon. However, the consequences of the increased effectiveness of future metal-detectors is difficult to assess.

A more general problem of Danish metal detector archaeology is related to representative issues. Critics of a liberal policy toward metal-detector archaeology often note that detectorists (at least those with the necessary level of experience and/or technological means) normally ‘discriminate’ or omit to collect and register iron artifacts. This issue is not limited to iron artifacts, as one unintended but highly problematic consequence of the Danish Treasure Act is the distinction between “good” finds (i.e., finds for which the finder is compensated by the Danish National Museum) and “bad” finds (i.e., finds for which no compensation can be expected). The bulk of the assemblage of metal finds from an ordinary Iron Age or early medieval settlement belongs to the second group (e.g., scrap metal, melted pieces, unidentifiable fragments of bronze and lead). Although such finds are important elements of the archaeological record on a metal-productive site, the focus on potential treasure-trove finds results in a misrepresentation of the evidence because these objects are often not collected by detectorists or omitted from the find registration at the respective local museum.

The most pressing problem that Danish archaeology urgently must address is the limited degree to which the substantial number of metal-detector finds – despite their great potential – are assessable for archaeological research. Although one easily can point out a considerable number of examples for research based on metal detector finds (see Dobat 2016), the overall picture is one of a limited degree of integration of Danish metal-detector finds in archaeological research. Most Danish finds remain unpublished and inaccessible and thus unexploited by research. The primary reason for this failure is the lack of a central registration scheme, which would provide access to specific find assemblages and artifact categories. The problem thus relates to the issue of recording policy and practice.

5 Recording Practice and Accessibility of Metal-Detector Finds in Denmark

The obligation to handle and register incoming archaeological finds is the legal obligation of both the many Danish local museums and the Danish National Museum and stipulated as such in the Danish Consolidated Act on Museums (2006). Due to this enormous increase in numbers, metal-detector archaeology has developed into an increasing burden for archaeological museums, who are struggling to maintain the pace at which new finds are turned in. On registration by one of the ca. thirty Danish local museum, metal-detector finds are registered in the respective museum’s registration schemes, each of them using different standards. This decentralized recording policy results in a fragmentation of data, rendering it impossible to establish an overview over certain artifact categories.

Local museums also register finds in the central “sites and monuments record” (<http://www.kulturarv.dk/fundogfortidsminder/>), a site-based record of archaeological finds and sites. The database is accessible for to members of the public. However, it rarely provides very basic information on the individual artifacts of a given locality and does not support the search for certain find categories.

At the Danish National Museum’s collection department for coins and medals, incoming finds are registered in analogue journals (in handwriting). The only digital, national recording scheme, which only covers treasure trove (except coins) from the prehistoric and medieval periods, is the Danish National Museum’s collection’s ACCESS database (GENREG). As an object-based inventory management tool, the GENREG database does not offer an online access option. In practical use as a research tool, GENREG has limited potential, due to the largely unstandardized classification system, the lack of find images, and the lack of geographical positioning.

Although certainly an unintended consequence of the present registration policy, the Danish National Museum possesses a de facto monopoly on the use of metal-detector treasure-trove finds in Denmark as a research resource, which is illustrated by the fact that most artifact studies across individual sites or a single museum’s respective areas of responsibility are conducted by researchers affiliated with this institution (for a more detailed argumentation see Dobat 2016).

According to the results of the ‘2015 Danish detectorists survey’ (see above), many detectorists have developed their own, private recording schemes; in most cases elementary databases, but in some also more complex schemes combining databases and GIS. In addition to these, detectorists use different Facebook groups (for example: Detektor Danmark, 1771, Detektormønten) to share finds and receive help from fellow detectorists (and trained archaeologists) in the dating and identify of their finds. The currently best way for the public and researchers to approach a comprehensive view of new finds is on these Internet platforms. Until recently, the largest platform was detectingpeople.dk (detectingpeople 2012). However, the individual entries on this platform rarely provide contextual information, and only a small fraction of finds are uploaded to this privately operated page. Of more recent date is a digital application for the recording of metal-detector finds (MitFund), which is offered by a private operator. The application combines a database system with geographical referencing and allows detectorists to establish a repository for their own finds and share artifacts on a publicly accessible platform.

One must conclude that the many thousands of metal-detector finds that annually are handed over to local museums and the Danish National Museum remain largely inaccessible to the public and researchers. Only a selection is published, while the bulk of the material turned in by detectorists is only registered at local museums, resulting in the fragmentation of data. Thus, the present recording practices for the recording of detector finds in Denmark stand in sharp contrast to the prevailing ideals of museum collection management and current trends towards citizen inclusion in heritage management.

The consequences are disturbing. Not only is the substantial and unique research potential of the numerous finds impossible to exploit; also the finds and their contextual data are in danger of being irretrievably lost – even though the individual finds have been reported by the metal detectorists. First and foremost, however, the lack of accessibility of detector finds for research poses a threat to the commitment of the detectorists and thus to the very preconditions of the liberal model. As argued for above, the model primarily owes its success to the detectorists’ understanding of their hobby as a contribution to the writing of Danish history. At present, however, the archaeological establishment does not fully satisfy the individual detectorists’ expectations to see his finds being used in research. One can already sense an increasing frustration among the practitioners, in debates on closed Internet forums for detectorists on this subject. And one could fear that it is only a matter of time before metal detectorists will question the legitimacy of the heritage sector’s claim of authority over their finds. In a long-term perspective, the lack of a central registration scheme is thus a threat to the future of the Danish model of liberal detector archaeology.

6 The Future of Danish Metal Detector Archaeology

One of the underlying reasons for the problem of Danish metal-detector archaeology, the fact that the increase in find numbers has led to a collapse of the load capacity within the system, is the lack of sufficient funding for the responsible institutions. As stipulated in the Danish Consolidated Act on Museums (2006), the Danish local museums and the Danish National Museum are obliged to handle and register incoming archaeological finds. However, the enormous increase in find numbers since the beginning of the metal-detector boom during the 1990s and especially in recent years, has not lead to a proportional increase in public funding to fulfill this obligation.

The other side of the problem, as argued for above, is the lack of the technological infrastructure, i.e., a functional recording scheme for Danish detector finds. The development and establishing of a central registration scheme to facilitate the management, research and dissemination of the many thousands of metal-detector finds and those that will be discovered in the next decades is one of the most pressing challenges that faces that Danish archaeology. The Portable Antiquities Scheme for England and Wales

(Portable Antiquities Scheme 2012, Bland 2005; 2009) or the recently initiated MEDEA project in Flanders (Belgium) (MEDEA 2014) could serve as suitable models.

It would, however, be self-deceptive to assume that professional museum staff alone would be able to manage the registration of the increasing number of finds that are to be expected in the future. Archaeological museums in Denmark are already struggling to maintain the pace at which new detector finds are turned in on a daily basis. The current political and economic climate renders it implausible that a call for additional public funding to increase museum staff would be successful.

To ensure a future model's economic sustainability, we probably need to think in a different direction than the traditional call for 'more funding'. It is felt that to establish a functional model for the future management of incoming metal-detector finds in Denmark, one must abolish traditional ideals of archaeological find registration as the exclusive domain of professionals and include the amateur metal detectorists in this part of the archaeological process.

It was one of the most noteworthy results of the '2015 Danish detectorists survey' that 70.1% of the respondents in fact expressed the wish to participate in the find registration process at museums, which can be assumed to constitute a promising basis for the implementation of such an inclusive and democratic approach.

Engaging members of the public, such as the Danish metal detectorists, to contribute to the registration of their finds by uploading images and GPS coordinates and providing basic object identification and descriptions in a provided online scheme would not only be a more sustainable but also a more rewarding path towards a solution of the capacity overload as it would not only lessens the administrative burden presently on the shoulders of professionals, but also add additional value to metal-detector finds as a source of public engagement with cultural heritage.

There are, of course, potential pitfalls of such an approach. Under different headings (in the UK the 'Big Society'), liberal governments across Europe are promoting the idea of increased civil contribution within spheres that previously were public obligations; the outsourcing of state's obligations to volunteers. The idea of involve metal detectorists in registration process of their finds thus carries the risk of being misuses for legitimizing funding cuts.

The Danish detectorists (legitimate) understanding of their recreational hobby as a contribution to the 'writing of Danish history', which in the public discourse is supported by representatives of the official stakeholders of archaeological heritage (museum curators and researchers), resembles the ideals of 'citizen science', in the form of public (individuals or larger crowds) contribution to scientific research in very different forms. The ideals and principles of 'citizen science' and 'crowdsourcing', as they have evolved over the past decades, provide a promising trajectory towards a sustainable solution for the challenge of the growing number of metal detector finds. These concepts may, however, also contribute on a more general level to the development of heritage practice towards a deeper involvement by the public. The participation of large communities of non-professionals in the process of not merely gathering and recording research data, but also in the process of analysing and interpreting that data, has become increasingly relevant in very different branches of science over the past decades. According to Bonney et al. (2009), citizen science, or Public Participation in Scientific Research (PPSR) may cover: contributory projects (initiated and designed by professional scientists for which members of the public contribute data), collaborative projects (initiated and designed by professional scientists in which members of the public contribute data and help to refine project design, analyze data and communicate results), and co-created projects (initiated and designed by professionals together with members of the public crowd, in which both parts are actively involved in most steps of the research process).

Most cases of recreational metal-detector archaeology falls into the first category of the model developed by Bonney et al. (2009) as the majority of practitioners rarely get (or get the opportunity to get) involved in the museum's analysis of finds and/or sites or the development of guiding research questions or methodological frameworks for the further investigations of specific assemblages. At the same time, however, many representatives of the Danish metal-detector community who, as individuals or members of larger collectives, engage with not only 'their' finds and sites, but also with analytical aspects to a level that would justify their work as falling under the second and third category of the model.

A challenging issue for the transfer of ideals and principles of PPSR to the field of recreational metal-detector archaeology is the fact that metal detectorists’ understanding of archaeological research and archaeological heritage management in most cases differs fundamentally from the scope and goals governing academia and the professional heritage sector. A good example would be the concept of ‘in-situ’ preservation, which clearly conflicts with the detectorists desire to produce finds.

Along the lines of the ideals and principles of citizen science and crowdsourcing, the necessary development of an economically, socially and politically sustainable model for the central registration of metal-detector finds in Denmark could be a catalyst for the inclusion and empowering of the numerous amateur detectorists not only as qualified fieldworkers but also as registrants and analytics, interpreting finds and developing explanations and research problems.

7 Conclusions

In conclusion, an ambivalent picture emerges. On the one hand, metal detecting by amateur detectorists in Denmark has contributed to a substantial increase in the number of data and sites and opened new research perspectives. On the other hand, the Danish case is also a tale of missed opportunities because the enormous research potential of the extensive Danish material is substantially under-exploited. Metal-detector finds have paved the way for research on new, previously unknown aspects of prehistoric societies. However, with few exceptions, the finds remain to be fully appreciated as a primary object of analytical archaeological research across regions and individual sites. Today, this appreciation is virtually impossible due to the lack of standardized registration principles and practice as well as a centralized, accessible recording scheme.

Danish metal-detector archaeology has challenged the classic division of roles in archaeology and heritage management, with amateur collectors producing finds but otherwise being more or less passive recipients of the expert knowledge of professional authorities. The ‘2015 Danish detectorists survey’ shows that at least the clear majority of Danish metal detectorists are not only very committed to their hobby but also highly proficient. There are of course also examples for the opposite and it would be naïve to believe that all Danish detectorists can be included in this group of ‘professional amateurs’, which this article has been focused on. The relationship between recreational metal detecting and the ‘official’ heritage sector is complex and this article does not attempt to provide an inclusive perspective on the Danish case, which would also have to encompass a focus on the negative examples. However, the negative cases only seldom reach public attention, and the people behind rarely wish to communicate with representatives of the heritage sector. The gravity of the problems relating to liberal metal detecting in Denmark, ranging from unsatisfactory handling of finds and incomplete or even completely missing information on find locations over ‘night-hawking’ to the sale of treasure trove finds on the global market, therefore is difficult to assess. It would be naïve, however, to believe that such problems don’t exist. Given the prevailing benefits gained from the many finds that are registered, this may seem like a cheap price to pay.

Especially when it comes to the recording of metal-detector finds, it is in fact the archaeological establishment, which is lagging behind the amateur metal detectorists in many respects. The various initiatives on this field run by members of the metal-detector community show that the latter have at least tried to tackle the challenges of the huge increase in finds, and that they have been quick to identify and use the potential of online recording schemes.

Against the results of the ‘2015 Danish detectorists survey’ and the general experience of metal-detector archaeology in Denmark in recent years, it is difficult to sustain the traditional divide between on the one hand the ‘professional’ archaeological establishment and on the other hand the ‘non-professional’ detectorists. At least in Denmark, a large part of detectorists practice their hobby adhering to the highest professional standards, which stand in sharp contrast to the often-cited stereotype of the detectorists as mere ‘treasure hunter’. The future will show, whether Danish archaeology can fully exploit the potential of these fortunate – and probably rather unique – circumstances.

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