METAL DETECTING IN DENMARK:
Advantages and Disadvantages of the Liberal Model

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Abstract: *Metal Detecting in Denmark: Advantages and Disadvantages of the Liberal Model*
Since the early 1980s, metal-detector surveying by non-professional volunteers (i.e., amateur archaeologists) has contributed significantly to archaeological research and heritage management in Denmark. Metal detecting has always been legal in Denmark, and since the beginning of metal-detector archaeology, official stakeholders have pursued a liberal model, focusing on cooperation and inclusion rather than confrontation and criminalization. Unlike other surveying methods, metal detecting has contributed to an enormous increase in the number of data and sites from metal-rich periods. Virtually all of the spectacular and groundbreaking discoveries of the past decades were made by amateur archaeologists using metal detectors. To contribute to the discussion on the advantages and disadvantages of a liberal policy toward metal-detector archaeology, this article primarily addresses three questions: 1) Why does the liberal model function in Denmark? 2) What are the disadvantages of the liberal model of metal-detector archaeology in Denmark that can be identified 30 years after its inception? 3) What are possible solutions to these problems? It is argued that a user-driven national inventory of metal-detector finds as the basis for research and dissemination is a precondition for the future functioning of the Danish liberal model.

BACKGROUND

In the early 1980s, the metal detector revolutionized Danish archaeology. The effect of the metal detector on the sheer quantity of material source data and the understanding of Iron Age and Early Medieval societies in particular can hardly be overstated. Unlike other surveying methods, the metal detector and the numerous volunteer amateur archaeologists who use it have contributed to a substantial increase in finds and find spots from the metal-rich periods. 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. Hardly a week passes without another press headline regarding a new Viking coin treasure or a rare gold ring from the Bronze Age.

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 treasure trove ("Danefæ" in Danish) and the compensation sum are determined by Danish National Museum staff based on 1) the find's metal value, 2) the find's rarity and 3) the care taken by the finder during the find's recovery.

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 volunteer amateurs (i.e., detectorists). Today — thirty-five years later — amateur metal detecting in Denmark is not only generally evaluated as a substantial success but has also has profound implications for archaeological heritage management and research.

Since the beginning of metal-detector archaeology, the number of finds by metal-detector surveys has increased tenfold. It appears that this tendency will continue in coming years. Only within the last four years, the total number of finds registered as treasure trove by the separate collection departments at the Danish National Museum (Prehistory, Medieval and the Collection of Coins and Medals) increased from 2,911 in 2010 to 4,290 in 2013. The total increase in metal detector finds in the field during the past years can be estimated to be even higher because these numbers must be correlated with the continuous "deflation" of the treasure trove status (see below).

Finds in certain artifact categories that only 20 years ago were regarded as exceptional or even unique are counted in the hundreds today. The so-called Urnes brooches from the second half of the 11th century provide an illustrative example. In 1992, in the early days of the metal-detector boom, Bertelsen (1992)

could base her analysis of this artifact group on a total of 110 registered individual finds. In the first half of 2014, the Danish National Museum's treasure trove register contained at least 332 entries on this type of brooch (Jensen et al. 2014).

Such benefits have come at a price. Between 2010 and 2014, more than 7.5 million DKK (1.0 million Euros) in treasure-trove compensation was paid to individual metal detectorists. However, in terms of a cost-benefit calculation and in light of the general expenses of archaeological rescue excavations in Denmark, this sum can be regarded one of the most profitable investments in Danish archaeology.

Today, amateur metal detecting in Denmark represents a deeply rooted cultural heritage practice, and detectorists and local museums closely cooperate in various contexts. The discovery of countless archaeological sites by amateur metal detectorists has helped identify sites that would have remained unknown. Amateur metal detectorists are key voluntary personnel on rescue and research excavations who empty the plow horizon of metal artifacts prior to excavations (Rasmussen 2007; Nielsen 2008; Hansen and Henriksen 2012). The incorporation of amateur detectorists has proven necessary not least because in terms of experience and knowledge they are generally far superior to archaeologically trained museum staff.

Against the background of the European Convention on the Protection of the Archaeological Heritage (Valetta 1992; signed by Denmark in 1992 and effectuated in national law in 2002), the increase in the number of detector finds over the last decades should be expected to possess the potential to generate controversy, at least within the formal heritage sector. The convention states that the ideal of the conservation and maintenance of the archaeological heritage *preferably in situ* (article 4) should be the primary goal of heritage management. This ideal stands somewhat in contrast to the active support or passive consent of amateur metal-detector archaeology in Denmark. However, the increasing find numbers are more or less unanimously considered to be a positive development, both in the public perception and by the archaeological establishment, although local museums struggle with deficient funding to administer the increasing number of incoming finds.

The underlying reason for the positive discourse on metal-detector archaeology in the media may be the fact that the news of Viking treasure or a Bronze Age gold hoard triggers a deep human fascination with ancient mystery and riches. In the professional sector, the prevailing arguments in favor of recovering detector finds from their plow-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.

WHY DOES THE LIBERAL MODEL FUNCTION IN DENMARK?

In many European countries, illegal metal detecting constitutes a severe threat to the cultural heritage and an ethical dilemma for archaeologists. However, although the metal detector may pose a threat, it has also become an important source of scientific

	2010	2011	2012	2013	2014
Incomming finds (total)	(no info.)	(no info.)	(no info.)	5,556	7,176
Treasure trove (Prehistoric and Medieval)	813	743	968	865	1,495
Treasure trove (Coins and Medals)	2,066	2,289	2,786	3,502	3,817
Treasure trove (total)	2,879	3,032	3,772	4,367	5,312
Total compensation paid by National Museum	1.3 mil kr.	1.25 mil kr.	0.9 mil kr.	1.2 mil kr.	3.0 mil kr.

Fig. 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. Information provided by Mads Schear Mikkelsen (the Danish National Museum).

Fig. 2: Metal-detector survey as part of the Kongens Borge research project at the Viking Age ring fortress at Aggersborg (2009). More than 30 amateur metal detectorists from different detector associations participated in the survey for two days. Photograph: Andres Dobat, Aarhus University.

knowledge, public legitimization and popular recognition of archaeology. As a hobby or a professional occupation, metal detecting is increasing in popularity and profitability. For certain practitioners, the activity expresses the sheer desire to hold a piece of history in one's hand, be it the distant and mystical past of Roman or Celtic civilizations or the all-consuming terror of the trenches of the two World Wars. For others, metal detecting primarily concerns monetary gain, and even a brief review of Internet auction forums suffices to indicate the large scale of the financial interests involved (regarding the motivations of metal detectorists in general, see Garrison 2009; Henriksen 2011; Thomas 2012). Until now, a skeptical attitude toward amateur metal detectorists in many European countries has prompted a refusal to cooperate with amateur practitioners and attempts to ban the unauthorized use of metal detectors in archaeological surveys by "non-professionals".

In sum, the Danish liberal model is generally considered to be a success, and the author is convinced that he speaks for the majority of Danish archaeologists when he states that the positive effects of a liberal policy toward detector archaeology far outweighs 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 (i.e., positioning finds with GPS coordinates, documenting a survey's spatial extent using GPS tracking systems, continuous surveying of specific sites). Most importantly, the majority of the practitioners abide by the treasure-trove regulations of the museum law and hand over their finds to local museums.

Why has metal-detector archaeology in Denmark not become the problem it has developed into in many other countries? Numerous official stakeholders of cultural-heritage management in Denmark expressed concerns during the early period of the practice and anticipated large-scale destruction of cultural heritage by ruthless treasure hunters (Fischer 1983; see also Nielsen and Petersen 1993). As the author has argued elsewhere (Dobat 2013), 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 and social aspects. Even the psychological disposition of the practitioners should be included as an important factor.

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 (approximately thirty at present) of archaeological museums. 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, e.g., 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, instructing detectorists on the handling of finds and on documentation standards, and arranging large-scale detectorist rallies. One must add the generally high level of trust in society and in particular in 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 in addition to 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 (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 (in terms of black-market prices) 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.

Fig. 3: Bornholm 2001: Detectorist Klaus Thorsen, an early practitioner 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 Margarethe II and the press. Photograph: Bornhoms Museum.

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 plow horizon of cultivated fields or fields that have been under the plow at least at one point in recent history. 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.

As non-professionals, Danish metal detectorists continue a long tradition of amateur (in the positive sense of the word) 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" (thy-morsdetektor 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.

Amateur detectorists tend to survey large areas or archaeological sites in the vicinity of their places of residence. A more recent trend observed by museum curators is the establishment of fixed "claims". That is, a detectorist or a group of detectorists reaches an informal agreement with a landowner for exclusive surveying rights in exchange for a share of *treasure-trove* compensation. Comparable with the system of individually managed hunting grounds on the European continent or in Scandinavia, where the conservation efforts of hunters ensure a sustainable harvest of natural resources, this type of close personal connection encourages the individual metal detectorists (and the landowners) to monitor "their" personal surveying areas.

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).

In sum, the following aspects can be identified as crucial for the problem addressed in this chapter (for a more detailed discussion, see Dobat 2013):

- The provision of a simple set of rules for liberal detector archaeology and the securing of financial compensation for the finders in the Danish treasure-trove legislation, with the amount depending on the care observed by the finder during the find's recovery.
- The decentralized character of the Danish museum landscape and the deep integration of museums in society as trustworthy institutions.
- Close cooperation and mutual respect between museums and individuals or organizations of amateur metal detectorists.
- The relatively small proportion of precious metal in the average metal-detector find assemblages and the nature of the typical Danish metal-detector sites (plowed fields).
- The long tradition of amateur (in the positive sense of the word) archaeology in Denmark.
- The generally professional attitude of metal detectorists toward their hobby and their understanding of metal-detector archaeology as a contribution to Danish cultural history.
- The high level of organization among metal detectorists and the various associations as well as the educational role of Internet forums.
- The general popularity of archaeology and a widespread, profound historical awareness in Danish society that is closely linked with national sentiments.
- A widespread consensus on the understanding of cultural heritage as valuable and communal property and a source of national identity.
- The "trophy factor" and the significance of metal-detector archaeology as a potential source of social and cultural capital.

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

Fig. 4: 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 treasure trove, i.e., finds for which financial compensation is paid to the finder by the state (length of the fibula bottom, right: 6,2 cm). Photograph: Østfyns Museer, Kerteminde, Denmark.

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.

BLACK SHEEP AND OTHER PROBLEMS

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 turned it but 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, 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. However, one must ask whether such cases would have been prevented by a restrictive policy. The experience in countries with a prohibition model provides a clear answer to this question. Prominent cases, such as the Nebra sky disc, or a brief review of Internet auction forums indicate

that a restrictive legal framework does not prevent illicit metal detecting. Given the prevailing benefits of the numerous finds that *are* registered, I wish to argue that the few real and the hypothetical number of unknown cases of illicit trade of Danish artifacts can be considered an acceptable price to pay.

A more general problem observed by museum curators is the unsatisfactory handling of finds and incomplete or completely missing information on find locations. 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 will continue 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 plow horizon. However, the consequences of the increased effectiveness of future metal detectors are difficult to assess.

REPRESENTATIVITY ISSUES

Like all surface surveying, metal-detector surveying, with its "trophy factor", is accompanied by the risk of a biased representation of artifact scatters because areas with a high ratio of finds are generally prospected more thoroughly than areas in which finds occur less regularly. Repeated reconnaissance may confirm or strengthen the appearance of artifact concentrations or supposed peripheral areas, which generates a biased representation of the outer limits or the internal structure of, for instance, a settlement complex (Paulsson 1999: 51; Watt 2000: 6). However, this problem can be easily addressed through the application of a systematic approach based on a grid system or a GPS tracking system and continuous monitoring of surveying intensity (Gregory and Rogerson 1984; Skre 2007; Dobat 2014).

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 ignore (through the detectors' discrimination function) or omit to collect and register iron artifacts. A balanced discussion of the consequences and the ethical dimension of this conscious selection cannot be presented within this article's scope. The primary reasons why iron signals/artifacts are typically ignored is that only a small number of them are chronologically and functionally indicative and even fewer have the potential to be declared treasure trove.

This issue is not limited to iron artifacts. 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.

To this issue one must add the problem of the "deflation" of treasure-trove status, which results in an increasing number of finds from the prehistoric and medieval periods that are not declared treasure trove and that consequently are not registered in a central record. In contrast to the standard practice at the Danish National Museum departments for prehistoric and medieval finds during the early days of the metal-detector boom, today, heavily fragmented fibulas from the Iron Age are not necessarily declared treasure trove (see Ulriksen 2014). It requires no explanation that even a small fragment of a fibula can possess the same research potential as a complete piece of the same type and that this prioritization based on esthetic parameters will eventually result in misrepresentative assemblages. In this respect, a positive exception is the collection policy of the Danish National Museums collection department for coins and medals, according to which all coins from before 1536 AD (regardless of their state and grade of fragmentation) are declared treasure trove.

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.

METAL-DETECTOR ARCHAEOLOGY AND RESEARCH

The metal detector has demonstrated its potential to provide new data, especially in the area of Danish settlement archaeology. A classic example is the discovery of the Gudme complex on the island of Funen in the early 1980s during the early days of the

detector boom. Today, after many years of continuous metal-detector surveying and excavations, Gudme is an icon of Danish archaeology, and the thousands of individual finds tell a vivid story of a chiefly elite with far-reaching international connections and political alliances that resided on the shores of a sacred lake and gathered specialized craftsmen and a military retinue (for a summary of the significance of the Gudme site, see Hedeager 2001; Randsborg 2007; Jørgensen 2011).

Gudme's discovery foreshadowed the discovery of many sites by metal detectors during the following decades. As late as the 1970s, the evidence of Early Medieval settlements was limited to fewer than twenty localities. Today, the number of sites with metal finds that indicate settlement activity or regular settlements from this period number in the hundreds, which suggests a settlement landscape of previously unexpected density and complexity: aristocratic residences (such as Tissø, on Sealand, or Sorte Muld, on Bornholm; rural settlements and manors; specialized production sites with evidence of a broad range of craft activities; and landing places and smaller market centers in the coastal regions (Näsman 1991; Ulriksen 1994; Fabech 1999; Henriksen 2000; Jørgensen 2003; Christiansen 2008; Adamsen 2009).

The large number of sites that have been discovered has radically changed our understanding of the socio-political constitution of Scandinavian societies during the first millennium and the Medieval period. Today, the sites discovered by metal detectorists constitute a focus of archaeological research on these periods. Whether it is a question of the evolution of early towns, religious transitions, trade and exchange, patterns of supra-regional contacts or military organization, the sites represent key sources for the respective studies (for example, see Fabech and Ringtved 1995; Stjernquist and Larsson 1998; Henriksen 2002; Jørgensen 2003; Skre 2007).

From a methodological perspective, the value of metal-detector finds as historical sources has been a debated subject, with the critics noting a lack of contextual data. There can be little doubt that metal-detector finds from plow horizons have been moved not only from their original context but also to varying degrees (depending on size and shape) within their secondary context of the plow soil. Thus, they cannot be related to *specific* contexts. However, not least the excavations that followed on intensive detector surveys at Gudme and other settlement sites demonstrated that the spatial distribution patterns of detector finds do add meaningful information to the structures unearthed below the plow soil, which enables the structural or organizational aspects of a site and even individual buildings to be assessed (Jensen 1987; Petersen 1994; Jørgensen 2000).

Metal detectors operated by passionate amateurs have not only contributed new knowledge in the field of Iron Age and Medieval settlement archaeology. For example, many single finds of bronze or gold have significantly broadened our understanding of the material world and deposition practices of the Bronze Age (Bæk and Runge 2008; Henriksen 2011; Hansen and Henriksen 2012). The increase in the number of coin finds, particularly from the early Medieval period onward, has paved the way for new possibilities in the study of the development of monetary systems (Grinder-Hansen 2000; Horsnæs 2002; Mäkeler 2003). In addition, the metal detector has opened new research areas, such as battlefield archaeology (Olsen 2009).

DISSEMINATION PROBLEMS

The previously mentioned studies clearly underline the research potential of detector finds for the understanding of the structure, function and significance of Early Medieval settlements. However, this potential is difficult to fully exploit because of the lack of published find assemblages. There are surprisingly few metal-detector assemblages from specific localities that are accessible through publications or publicly accessible databases. Even the substantial assemblages of iconic sites, such as Gudme, Tissø or Lejre, are impossible to completely evaluate, at least at present. With few exceptions, only small fragments of the material from the many well-established and new metal detector sites have been published, often only the few outstanding artifacts of precious metal or exceptional craftsmanship. Ironically, one must include the exemplary research on the large metal-detector assemblages from Uppåkra in Scania (S) and Kaupang in Vestfold (N) to understand the potential of fully exploited metal-detector finds in the analysis of a particular site (Hårdh 1999; 2003; Skre 2011).

The few cases of detailed empirical and analytical studies on Danish metal-detector finds are investigations of assemblages from certain sites or certain types of artifact. A good example, which underlines the research potential of particular find categories among the large number of detector finds, is Feveile's study on a previously largely unknown type of cruciform fibula (Feveile 2011). Although certainly locally produced, the so-called Råhede-type brooches are modeled on 9th century Carolingian brooches and can be regarded as possible indicators of early Christian

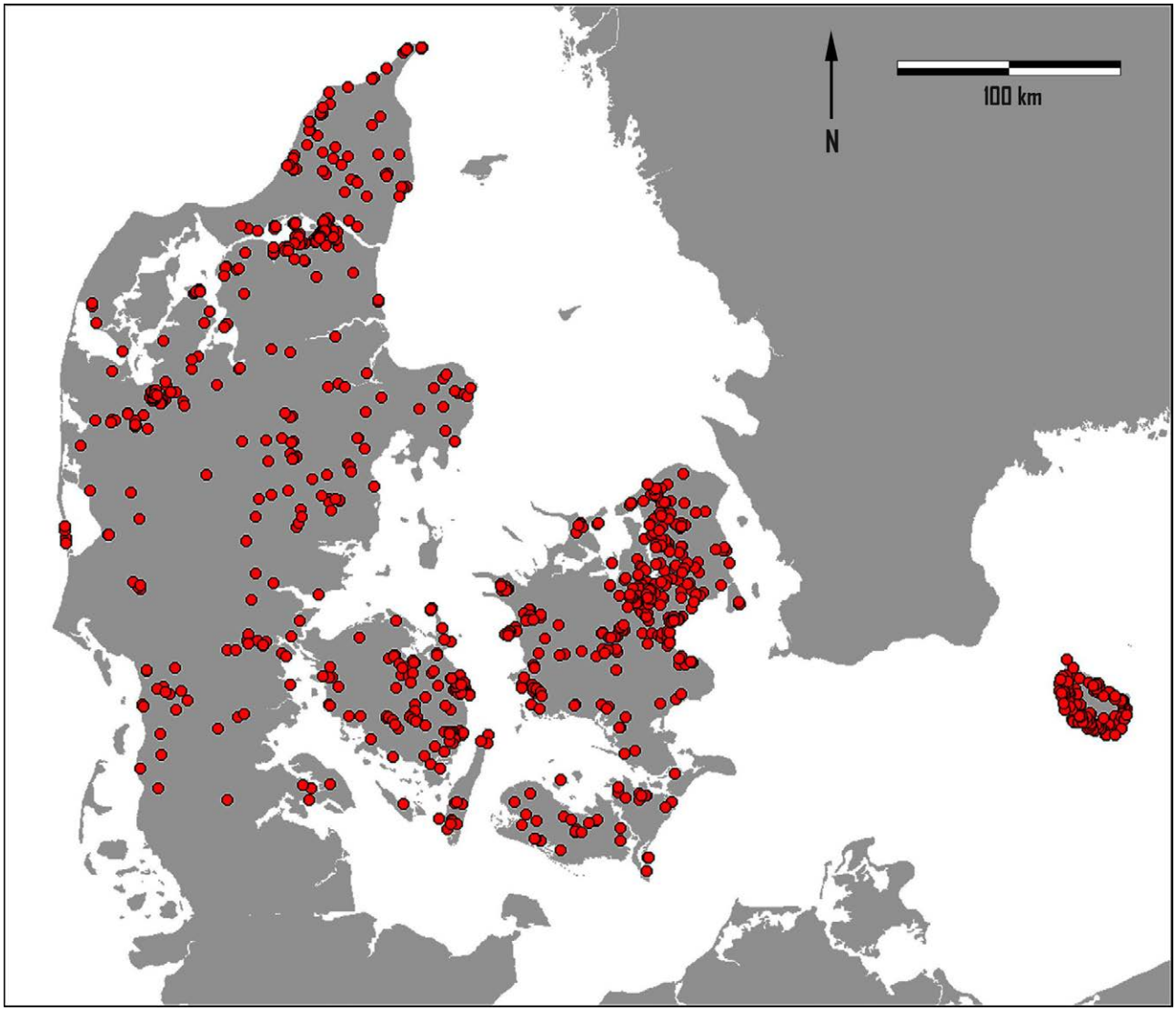

Fig. 5: Distribution of find spots for treasure trove finds discovered with metal detectors in Denmark up to and including 2006. Data: Kulturstyrelsen; drawing by Mogens Bo Henriksen, Odense Bys Museer.

influence long time before the earliest written evidence of the advent of Christianity. With a focus on selected foreign elements, Baastrup (2009; 2012) has made an initial inventory of detector assemblages as reflections of external relations and cultural exchange. Other examples of cross-regional studies on specific artifact categories are Ulriksen (2003) and Pedersen (2001; 2004).

In particular, the increasing number of coin finds, which range from Roman coins to Viking Age types to medieval coinage, has been the subject of intensive studies. The research environment at the department for coins and medals at the Danish National Museum has been the driving force behind most studies on the subject (Moesgård 2002; 2009; Horsnæs 2010; Ingvardson 2010).

Christiansen's regional study of metal-detector finds (limited to treasure trove) from the eastern half of the Limfjord is a rare example of a regional study that attempts to establish an overview of the distribution and character of the find material across individual sites (Christiansen 2008; see also Christiansen in this volume).

Although these studies demonstrate that there *are* examples of the inclusion of detector finds in more detailed empirical and analytical studies on different aspects of prehistoric and medieval societies, 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. Notably, the majority of empirical and analytical studies on metal-detector finds across individual sites or a single museum's areas of responsibility have been conducted by researchers affiliated with the Danish National Museum.

The circumstances are not substantially different regarding the methodological aspects of metal-detector archaeology or its integration in the development of surveying strategies on a more general level. Already in 1998, Odense Bys Museer sponsored one of the first research seminars that focused on the question of metal-detector archaeology in Denmark. Departing from the provocative question "what is the use of metal-detector finds?" several contributions discussed surveying strategies, registration principles and the research potential of metal-detector finds (Henriksen 2000). Since then, research efforts on these and related questions have been limited. Noteworthy exceptions are the more recent and ongoing study of Feveile (in press) on the relation between fertile soils as indicated in 19th century cadastral maps and productive metal-detector find spots on the island of Funen and the research by Christiansen (2008; see also Christiansen's contribution in the present volume) on metal-detector finds and surveys around the Limfjord in Northern Jutland. Other examples of a constructive approach to the use of detector finds as an analytical tool for the analysis of settlement patterns are the more recent studies by Horsnæs (2012) and Dobat (2014).

In sum, one can argue that the history of Danish metal-detector archaeology during the past 30 years exemplifies the substantial research potential of metal-detector finds for various fields of archaeology. However, the Danish case can be viewed as a tale of missed opportunities because the true potential of the ever-increasing number of finds still cannot be fully exploited. Metal-detector finds have paved the way for research into new, previously unknown aspects of prehistoric societies. However, the finds have yet to be fully appreciated as a primary object of archaeological research and detailed analytical studies across individual sites and regions in the manner established in recent years in England based on the database of the Portable Antiquity Scheme under the British Museum. The studies by Ulmschneider (2000), Naylor and Richards (2006) as well as Kershaw (2013) are mentioned as examples. 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.

RECORDING POLICY AND PRACTICE IN DENMARK

The only central, national recording scheme, which only includes treasure trove (except coins) from the prehistoric and medieval periods, is the Danish National Museum's collection's ACCESS database (GENREG). Established in the early 1990s as an object-based inventory management tool (Rold 1995), it links free-form text descriptions and pictures of objects with information on the accession history (including sensitive personal information) and provenience (in the form of place names). Although the developers originally expressed an intention to develop the GENREG database into an "*interactive research tool to carry out special research tasks – as well as a tool and data bank for exhibitions and public access*" (Rold 1995: 35), it has remained an internal registration tool without an online access option.[1] At the Danish National Museum's collection department for coins and medals, incoming finds (most of which are the result of detector surveys) are still registered in analog journals (in handwriting!).

On registration by a Danish local museum, metal-detector finds are also registered in the Danish "sites and monuments record" (http://www.kulturarv.dk/fundogfortidsminder/), which is a site-based record of archaeological finds and sites. The database is accessible to members of the public. However, it rarely provides even basic information on the individual artifacts of a given locality and does not support a search for certain find categories.

At most Danish museums, the registration of individual finds is managed by the MUD (Museernes UdgravningsData) system, which automatically synchronizes with the central artifact registration system for Danish Museums REGIN. Both schemes are internal tools primarily designed for the administration of excavation data and collections and are not accessible to members of the public. Finds are generally recorded under broad categories on a rudimentary level and lack basic illustrations.[2]

1 In practical use as a research tool, the GENREG system has displayed limitations. Only a small number of recent entries of treasure trove found by detectorists include photographs or drawings, few of which include a scale bar. Thus, meaningful analysis of certain find categories is impossible. The possibility to search for specific artifact types or qualities or to establish basic data patterns within the material is problematic due to the largely unstandardized classification system in combination with the-form free text description (Jensen et al. 2014).

2 In cooperation with the Danish museums, the Danish Agency for Culture is developing a new digital infrastructure for find registration and collection management: SARA (Samlingsregistrering og – administration) (2015). The system is intended to be publicly accessible and to function as a tool for researchers and members of the public. For additional details, see http://www.kulturstyrelsen.dk/institutioner/museer/museernes-arbejdsopgaver/registrering/projekt-sara/.

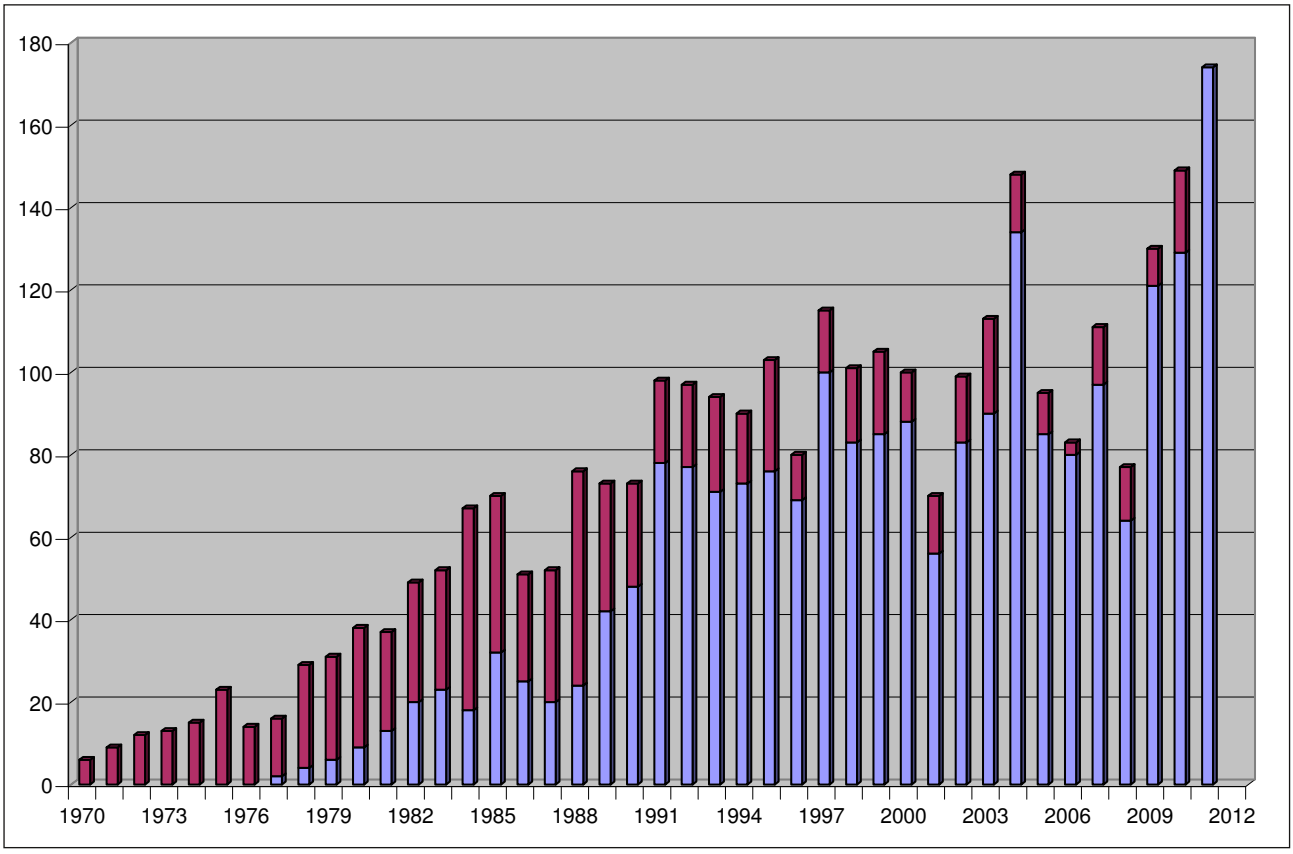

Fig. 6: Increase in the number of find spots that have produced treasure trove finds discovered with (blue) or without (red) metal detectors in Denmark during the period 1970–2011. The substantial majority of the non-metal detector treasure trove finds are of stone, amber or glass (the decrease between 2006 and 2008 is explained by administrative issues and does not reflect actual circumstances). Source: Mogens Bo Henriksen, Odense Bys Museer, based on data from the Danish National Museum.

The best way for the public and researchers to approach a comprehensive view of new finds is on the Internet platforms of the Danish metal-detector associations. Currently, the largest such platform is 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.

Articles 2 and 7 of the European Convention on the Protection of the Archaeological Heritage (Valetta 1992; signed by Denmark in 1992) emphasize the importance of 1: archaeological finds being "available for examination" and 2: the establishment of "surveys, inventories and maps of archaeological sites". These goals are recognized in the convention's national effectuation through the Danish Consolidated Act on Museums provision that "*Through collecting, registering, preserving, researching and disseminating the museums shall (…) (4) make the collections and documentation accessible to the general public, and (5) make the collections and documentation accessible for research, and communicate the results of such research.*" It seems needless to state that the present schemes for the recording of detector finds in Denmark do not achieve these ideals. The various systems are designed as internal administrative tools and are not publicly accessible. Thus, they cannot support the use of metal-detector finds for research or public dissemination.

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. As Andresen (2009) has noted in his general discussion of the present state of the central registration of archaeological data and research in Denmark, the law's provisions to secure broadly shared ownership of cultural heritage data emerge more as an ideal than as an actual policy.

One must conclude that the many thousands of metal-detector finds that are annually handed over to local museums and the Danish National Museum remain largely inaccessible to the public and researchers.

Only a selection (e.g., spectacular objects made of gold with glittering stones) is published (for example, see Andersen and Nielsen 2010; Nielsen 2012). The bulk of the material turned in by detectorists is only registered at local museums, each of which uses different registration practices and standards. The consequences are disturbing. Not only is the substantial and unique research potential of the numerous finds impossible to exploit but also the finds and their contextual data (and with them a central component of Danish cultural heritage) are in danger of being irretrievably lost — even though the individual finds have been reported.

TOWARD A SUSTAINABLE MODEL FOR RECORDING AND DISSEMINATION IN DENMARK

As others have before me, I wish to argue that the lack of central, permanent registration procedures for past and future metal-detector finds represents a time bomb under the shining surface of Danish metal-detector archaeology. The development and establishment 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 and one that must be resolved. The guiding principles in the development of such a database must include public accessibility, geographical positioning, auto-syncing of other databases (e.g., the Danish sites and monuments record and the future SARA system), varied access levels, and strictly defined vocabulary for descriptions and search functions. 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.

Danish metal-detector archaeology has challenged the classic, somewhat outdated 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. Many active practitioners are exceptionally well informed regarding the dating and significance of certain finds. Aided by the new media, the community has established well-functioning forums that facilitate the exchange and distribution of knowledge.

It would be self-deceptive to assume that the registration of the increasing number of finds that are to be expected in the future, particularly in such regions in which the metal-detector boom has not peaked, can be managed by professional staff at local or national museums. These institutions are already struggling to maintain the pace at which new finds are turned in. I wish to argue 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. As they have evolved over the past decades, the ideals and principles of citizen science and crowdsourcing may offer a promising path toward a sustainable solution of the problem. The participation of large communities of non-professionals in the process of gathering and recording data according to specific protocols and in the process of using and interpreting that data has become increasingly relevant in science and other public domains. Not least in Britain, the recognition of the potential of this development has resulted in a number of projects that involve members of the public in archaeological or heritage-related projects. In addition, the Portable Antiquities Scheme under the British Museum, in which from the beginning find recording has been the more or less exclusive domain of regional finds liaison officers, has more recently invited non-professionals to participate by identifying and recording finds on the scheme's database in cooperation with these officers. In practice, only a small number of detectorists have the inclination (and skills) to act as self-recorders. However, those who do exert a considerable impact (pers. comm. Michael Lewis).

The special preconditions of the previously described Danish liberal model, particularly the professional attitude and high level of commitment of the Danish detector community, constitute a promising basis for the implementation of a similar inclusive approach. Therefore, the necessary development of an economically, socially and politically sustainable model for the central registration of metal-detector finds must include and empower the numerous amateur detectorists not only as qualified fieldworkers but also as monitors and registrants, who report and register the results of their research.

Substantial potential lies in the development of the Danish model of cooperation between the detectorists and the formal heritage sector, a cooperation which currently remains rooted in an outdated division between detectorists and authorized heritage caretakers. Thus, Danish metal-detector archaeology and the development of a user-driven recording scheme promise to transcend the classic agenda of the protection, study and dissemination of cultural heritage. In addition, the movement provides the opportunity to follow up today's ideological and political ambitions

for civic empowerment and the democratization of heritage care with concrete action.

CONCLUSIONS

In conclusion, an ambivalent picture emerges. On the one hand, metal detecting by amateur detectorists has contributed to a substantial increase in the number of data and sites. It has not only radically altered our understanding of central aspects of Scandinavian societies during the metal-rich periods but also opened new research perspectives.

The explanation why metal-detector archaeology practiced by members of the public in Denmark never developed into the problem it has become in many countries is complex, and the success of the Danish model must be sought in the complex interplay of legislative, historical, cultural and social aspects. One key is the cultural background and the psychological disposition of the detectorists, who are generally characterized by a highly professional attitude and who abide by the treasure-trove regulations of the museum law. The (relative) success of the Danish liberal model is based on the practitioner's incentive to engage in metal detecting as a means to actively contribute to the writing of cultural history and to actively produce cultural heritage instead of passively consuming it through media or in museums.

However, the Danish case can be understood as a tale of missed opportunities because the promising 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.

Unfortunately, metal detecting in Denmark is primarily "trophy hunting", i.e., the pursuit of a find for the "thrill of the hunt" with the goal of obtaining the horns (while discarding the meat) of a mature representative of a specific species. This failure is not that of the detectorists but that of the formal heritage sector, which has not provided the technological underpinnings for a meaningful use of metal-detector finds as research data. The ultimate danger of this lack of research on detector finds and the failure to disseminate finds and research results is that metal detectorists will lose sight of the validity of the heritage sector's claim of authority over their finds.

Only if metal-detector finds are used as research resources and if the results of such research are accessible to the practitioners in the field and the broader public can we expect the liberal model to be sustainable. In addition, only by the establishment of a national or international recording scheme for metal-detector finds by members of the public, similar to the Portable Antiquity Scheme, will we be able to transform metal detecting from the trophy hunt it is today into a substantially more rewarding (and far more legitimate) "meat hunt" that fully exploits the resources of the quarry.

As previously noted, the main argument in favor of recovering metal detector finds from their secondary plow soil context is that of preservation concerns. This view is legitimate because the recovery of such finds protects them against the immediate perils of, e.g., agricultural activity, acid rain, and chemical fertilizers. However, are the objects saved? I wish to argue that they are not. As long as we lack a central, standardized, publicly accessible recording scheme as the basis for research and dissemination, the numerous metal-detector finds are in acute danger of becoming useless, i.e., pretty objects that we can display on a shelf but silent regarding new knowledge.

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