Boundary Making in Translation Zones

Analyzing the Differences and Commonalities between Professionals and Volunteers

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ABSTRACT

The article discusses practices of cooperation between metal detectorists and professional archaeologists in Germany by exploring the approach of the regional office for historic preservation (Generaldirektion Kulturelles Erbe) in Speyer (Rheinland-Pfalz, southwest Germany). Its model is based on open access to a permit for detecting in a certain area, combined with regular meetings in order to establish knowledge circulation between volunteer and professional spheres. Relying on ethnographic fieldwork and questionnaires, the research shows that the approach creates a symmetric coproduction of knowledge, recognizing the metal detectorists as volunteer researchers producing genuine knowledge. Several theoretical aspects of knowledge circulation are analyzed with regard to their relevance for practices of knowledge production. The enactment of the boundary between public and professionals is the result of boundary work actively performed. As a consequence, this boundary should rather be seen as a fluid, hybrid zone, conceptualized as a translation zone. The concept of boundary objects points to the importance of specific elements for enabling circulation of knowledge between different spheres. Various communities of practice and their shared practices, conventions, perceptions, et cetera, influence the relationship and knowledge circulation, and these should be taken into account in coproduction processes.

Keywords: metal detecting, participatory archaeology, Germany, theory of knowledge production, boundary work, boundary object, community of practice

El articulo habla de las prácticas de cooperación entre los buscadores de metales y los arqueólogos profesionales en Alemania, explorando la estrategia de la oficina regional para la preservación histórica (Generaldirektion Kulturelles Erbe) en Speyer (Rheinland-Pfalz, el suroeste de Alemania). Su modelo se basa en el acceso abierto a una autorización para detectar en una zona particular, combinado con reuniones regulares para establecer la circulación del conocimiento entre las esferas voluntarias y profesionales. Basándose en el trabajo de campo etnográfico y en los cuestionarios, las investigaciones demuestran que la estrategia crea una coproducción simétrica del conocimiento, reconociendo a los buscadores de metales como investigadores voluntarios que producen el conocimiento auténtico. Se analizan varios aspectos teóricos de la circulación del conocimiento, con respecto a su relevancia para las prácticas de la producción del conocimiento. La promulgación de la frontera entre el público y los profesionales es el resultado del trabajo de frontera realizado activamente. Como consecuencia, esta frontera se debería ver más bien como una zona fluida e híbrida, conceptualizada como una zona de traducción. El concepto de objetos fronterizos señala la importancia de los elementos específicos que posibilitan la circulación del conocimiento entre las distintas esferas. Varias comunidades de práctica y sus prácticas, convenciones y percepciones compartidas, etc. influyen la relación y la circulación del conocimiento, y se deben tener en cuenta en los procesos de coproducción.

Palabras clave: detección de metales, arqueología participativa, Alemania, teoría de la producción del conocimiento, trabajo de frontera, objeto fronterizo, comunidad de práctica

Participatory practices and the involvement of local actors and other interested individuals at all levels of academic knowledge production and presentation are today recognized as a central element of archaeological activities (Marshall 2009; McDavid 2014, Moshenska 2017; Pyburn 2019; Roued-Cunliffe and Copeland 2017; Smith 2014; Thomas 2014; Tully 2007; Williams et al. 2019). One way to interact is cooperating with metal detectorists, which was long seen as problematic but is now accepted as an important way to develop practices of coproduction in archaeology (Deckers et al. 2018; Dobat, Wood, et al. 2020; Thomas 2012; Thomas et al. 2015). Recent debates centered on the term "citizen science," particularly in natural sciences (Finke 2016; Hecker et al. 2018; Oswald and Smolarski 2016; Vohland et al. 2021). In archaeological and heritage discourse, such approaches are instead discussed under the labels "public archaeology," "community archaeology," "postcolonial archaeology," or "public history." The most

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adequate terms seem to be "participatory," "cooperative," or "collaborative" archaeology (Eitzel et al. 2017).

This article is based on some results of the Citizen Science in Archaeology research project (CiSAr), located at the Institute of Pre- and Protohistory and Near Eastern Archaeology at Heidelberg University, Germany. Funded for one year by Heidelberg University, the aim of the project was to explore citizen science initiatives by choosing two case studies of participatory collaboration. Such research does not yet exist regarding participatory archaeology in Germany (Arendes 2017, Karl 2019; Möller 2019), given that participatory practices are still at the beginning of gaining acceptance, and cooperation with detectorists is still seen as problematic by some professionals. The project combines empirical research with theoretical concepts of academic knowledge making and the boundary between academic and volunteer spheres. Regarding the scope of the issue, this article will concentrate on how these theoretical approaches help to improve practice by raising awareness for presuppositions and discursive practices, and it will focus on one of the case studies: the collaboration between metal detectorists and the regional office for historic preservation (Generaldirektion Kulturelles Erbe [GDKE]) in Speyer, in the Rhineland-Palatinate in West Germany (Figure 1).[1]

Following a discussion of the relevant theoretical concepts, the research methods of participant observation and the questionnaires will be described. These methods aim to explore volunteers' perceptions, opinions, and practices, which can be helpful to develop meaningful cooperative practices. Next, the situation in Germany in general and the concept of cooperation of the GDKE Speyer will be described. Then, some results of the research concerning the construction of boundaries, such as the motivation of the volunteers to go detecting, their perception of the boundary, and their practices will be explored. Their social structures will also be presented, hereby drawing on two theoretical concepts from science studies: boundary objects and communities of practice. Finally, in the conclusion, the benefits of this approach for improving practice will be discussed.

Several developments led to the current role of participatory practices in archaeology. Because heritage today is generally understood as shared heritage, archaeology needs to be more transparent and more democratic. Here, participatory practices are a central element. This includes an ethical responsibility on several levels: to inform the wider society about research results, to consult interested actors and local groups, to develop practices of coproduction of knowledge, and to explain how scientific knowledge is produced. Instead of being seen as a unilinear transmission of fixed results, information should be conceptualized as a circulation of knowledge between science and society. Knowledge travels between those spheres as presentations of knowledge (for example, in museums) reflecting back into production of knowledge, being reconfigured through the presentation process (see also Laužikas et al. 2018). Therefore, all interested actors should be incorporated in the making of presentations. Consulting should be part of all steps of the production process, from preparation to presentation, in order to incorporate the perspective of locals and those who feel connected to a project. Ideally, projects should be developed together.

Furthermore, participatory practices can make scientific knowledge formation contexts visible by supporting a general transparency of how scientific knowledge in general and archaeological knowledge in particular is produced: explaining the methods used in the production process and why they were chosen, which arguments and narratives make certain results plausible, and what the limitations of knowing are. Such a general transparency could encourage the development of public competence in evaluating scientific knowledge in general.

Archaeology also gains from transparency and cooperation by potentially stimulating volunteers' engagement in heritage protection, and by making invisible knowledge visible. As long as metal detectorists' practice is regarded as illegal, their experience and finds cannot travel into the academic sphere. This makes it more reasonable to see their potential by trying to incorporate them into academic practices.

Finally, digitalization raised the importance of collaboration as producing more information, which can only be processed with the help of volunteers. But volunteers should not be seen as mere free laborers. Instead, they are equal partners in the coproduction of knowledge, with their perspectives taken seriously. Furthermore, digitalization makes new practices of participation possible—for example, analyzing lidar data by volunteers through apps, collecting documents and information in digital databases, or developing new forms of crowdfunding (e.g., Bonacchi 2017; Lambers et al. 2019).

THEORETICAL CONCEPTS OF SCIENTIFIC KNOWLEDGE PRODUCTION

Although participatory practices are more accepted today, a dichotomized and hierarchical concept of the relationship between volunteers and professionals still persists. This is visible, for example, in the labeling of an individual as a "layperson" or "amateur," even when that individual is very experienced. Narratives of dichotomy and discontinuity argue that volunteers are not willing or able to develop the competence to use academically accepted methods and procedures. Some seem to see the cooperation rather as a burden that requires too much educational effort and supervision (e.g., Davydov 2018:10). One central narrative of dichotomy argues that volunteers' motivations differ from those of professionals. Metal detectorists are seen as only motivated by a passion for collection or commercial gain (Davydov 2018:7), or confirmation of their own interpretations. In contrast, scientific knowledge production is seen as a neutral practice, free from personal interests. Such narratives can be found, for example, in the argument of the German sociologist Matthias Jung[2] that the ability to perform accurate academic knowledge production is based on the development of a specific habitus of academic problem solving, which cannot be learned by volunteers (Jung 2010, 2015). He argues that the willingness to be guided by the regulative idea of truth and to learn the objectification of personal interests, to accept the logic of the better argument, to expose oneself to critique, and to be prepared to change one's own hypothesis and theories can only be developed through participation in the specific knowledge practices of the discipline and through mentorship by experienced researchers. Maintaining the dichotomy between documentation and analysis

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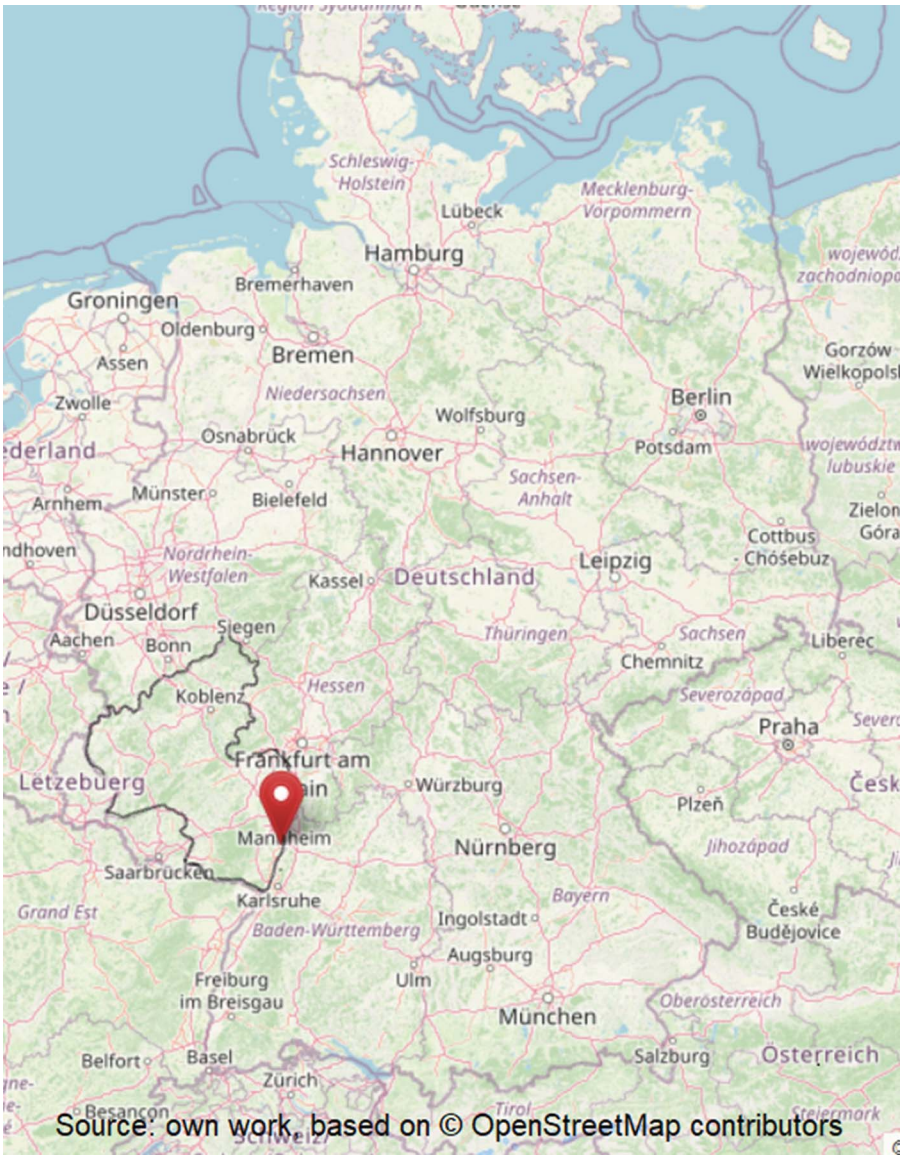

FIGURE 1. Location of Speyer in Rheinland-Pfalz.

allows him to argue that, whereas documentation practices can be conducted by non-academic persons, only professionals are capable of the methodical ordered analysis of reality (Jung 2015:44–45).

These arguments are in the tradition of earlier concepts of scientific knowledge making. Models of logical positivism, with its concepts of empiricism and rationalism, believed that science can produce verified statements through rational observations that result in objective descriptions of nature, and that these neutral observations can be distinguished from interpretation. Similar concepts can be found in critical rationalism by Karl Popper and his model of falsification of hypothesis as well as in the sociology of science, with its concept of four sets of institutional imperatives (communism, universalism, disinterestedness, and organized skepticism), which obviously influenced Jung's concept. These approaches claim a privileged position of scientific knowledge, an epistemological exceptionalism in comparison to other ways of knowledge production practices. But developments in science and technology studies since the 1970s show that this privileged position of scientific knowledge cannot be seen as preexisting. Instead, it must be conceptualized as constructed (cf. Felt et al. 2017). Following their arguments, scientific knowledge making is not an objective description of reality. Rather, it is the result of the establishment of certain routines and standardization, and of the negotiations and selective processes of what is currently accepted as plausible methods, argumentations, and results enacted by heterogeneous human and nonhuman actors in specific social practices in a highly artificial environment—for example, the excavation trench producing an artificial space. Consequently, such accepted practices of knowledge production can be learned by volunteers as well by their taking part in academic practices and entering academic discourses. A specific habitus of academic knowledge production should rather be seen as a tacit knowledge of contexts and conventions of knowledge production in a specific

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discipline. Therefore, Jung's argument is very problematic given that it does not describe the situation adequately.

THEORIES OF THE BOUNDARY

As a consequence, the boundary between volunteers and professionals is now seen as constructed and enacted. In science studies and learning theories, "boundary" is defined as a "sociocultural difference leading to discontinuity in action or interaction" (Akkerman and Bakker 2011:133) and seen as constantly produced and simultaneously made fluid. The American sociologist Thomas Gieryn described these processes as boundary work. Criteria for scientific claims of epistemic authority—defined as the legitimate power to define, describe, and explain bounded domains of reality (Gieryn 1999:1)—are always negotiated and therefore historically and contextually determined. Epistemic authority of a method, instrument, or place is not preexisting but is ascribed (Gieryn 1999:19) and enacted as people debate and decide where to locate legitimate jurisdiction over facts (Gieryn 1999:15), usually by contrasting it with other forms of knowledge, methods, or expertise (Gieryn 1999:10) framed as "nonscientific." Therefore, the analysis of the cooperation between volunteers and professionals should look at the locations of science in physical as well as in narrative ways, and examine the actors involved in claims of authority and affected by it. Emily Oswald explored boundary making in a cooperation between members of a local botanical society and the Natural History Museum at Oslo University, investigating how participants in citizen science projects experience boundaries, and how these boundary experiences are addressed. She showed that such an analysis contributes to "a more nuanced understanding of the challenges for collaboration in citizen science" (Oswald 2020:2).

To develop adequate descriptions of the relationship between volunteers and professionals, several new concepts and terms were suggested, such as "amphibian zone" (Finke 2016), "zone of transaction" (Niewöhner et al. 2012), "contact zone" (Clifford 1997; Pratt 1992) or "trading zone" (Galison 1999). The term "translation zone" might be adequate, imagined as a fluid border within a hybrid zone of translation, in which knowledge and practice circulate between academia and society, and no substantial difference between the practice of volunteers and professionals preexists. As a consequence, volunteers cannot be seen as a homogenous group. Various motivations and practices might place some actors at the fringes of the translation zone, but volunteers should be regarded as participants within this zone with regard to the extent to which they participate in academic practices.

RESEARCH METHODS

The CiSAr project relied on a combination of qualitative and quantitative social research methods. The strength of qualitative methods such as participant observation lies in their ability to acquire individual perceptions and valuations by observing the practices. Research included attending online meetings among members of GDKE and joint meetings with the volunteers. Furthermore, volunteers were asked if they allow participant observation on their survey trips. So far, five detectorists have been accompanied.

Quantitative methods served to gather perceptions of a broader set of participants and contextualize the qualitative material. These consisted of an online questionnaire sent to all permit holders in spring 2021, combining multiple choice and open questions. So far, no such research in Germany has been conducted. The questionnaire does not aim to be fully representative, given that double completion cannot be excluded. Nevertheless, it gives detailed insight. The questions addressed participants' assessment of the program and suggestions for improvements, their perceptions of the practice of metal detecting, and their relationship to the professionals. One hundred and fifty detectorists filled in at least part of the questionnaire, 100 of whom completed it. The questionnaire was then analyzed using MAXQDA software to code the free-answer sections. The results are currently being discussed with volunteers in order to coproduce the results with the participants. For this reason, only preliminary outcomes can be presented. Full results will be published elsewhere.

COOPERATION WITH DETECTORISTS AT GDKE SPEYER

In general, the relationship with detectorists in Germany is very heterogeneous (see, for example Karl and Möller 2016). Because Germany consists of federal states, each state is independent in defining its own heritage laws, which has led to the development of different formats of relationship. The offices for historic preservation usually consist of a central institution with several regional branches. Speyer is one of the four branch offices of the Generaldirektion Kulturelles Erbe (GDKE) in the state Rhineland-Palatinate (Rheinland-Pfalz) in western Germany. Generally, all activities that involve searching for historic objects or sites need a research permit (Nachforschungsgenehmigung [NFG]). Until recently, volunteers were able to obtain such a permit only on a very limited scale. Archaeologist Sophie Hüglin criticized the main approaches in German historic preservation as still defending a dominant position of professionals in heritage discourses (quoted in Scherzler and Siegmund 2019:20). But many argue now for a general rethinking, having seen the potential of the experience and tacit knowledge of the detectorists and the new knowledge, new sites, and unknown objects uncovered by them. This new approach has led to a heterogeneous situation in Germany today. Some states still limit the cooperation, accepting very few detectorists for participation. But the majority of states have established programs for volunteers to apply for research permits. But here, again, very different concepts of access were chosen.[3] Some states have made preparation courses obligatory for a research permit. This, however, limits access, according to detectorists cited on the YouTube channel "German Treasure Hunter," produced by a volunteer, who state there are complaints in several states about limited numbers of preparation courses and long waiting lists.[4] GDKE Speyer chose a different way by adopting an open approach, with no requirements of preparation courses of any kind. The program started in 2015. The decision to start a collaboration program was influenced by the excavation of the so-called Hortfund von Rülzheim (consisting of several silver objects and other valuables) in 2014 by a detectorist who did not inform the authorities. Currently, around 200 permit holders participate in the program, which is also the limit of permits possible for GDKE Speyer to cover. Applications for a research permit for a

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certain area for the subsequent year can be submitted via e-mail. Beginners have to reapply annually, whereas experienced volunteers can get the permit for extended periods. Applicants suggest research areas, which are usually accepted. The permit allows for survey on all fields within their area—except heritage sites—provided they get permission from the owner of the land and follow the rule not to go deeper than 20 cm. All finds must be documented, for which a standardized form was recently established. Beginners are encouraged to deliver all finds so that they can gain experience through discussion with the professionals. Objects regarded as academically important are claimed by GDKE Speyer. The decisions are explained to the volunteers in a file with a photo and further information so that knowledge travels back to the volunteers. All other objects are returned to the volunteers after processing, if they wish. Several employees at GDKE Speyer interact with the volunteers, organizing communication, processing the finds, and providing suggestions of dating and interpretations.

A central element in the cooperation is regular meetings, which are held several times a year. These are used for presentations, the delivery of finds, and informal conversations with beer and snacks.[5] Volunteers are encouraged to attend as many meetings as possible. Usually around 80–100 volunteers are present, and they meet with roughly seven actors of GDKE Speyer and several other specialists of various fields. Meetings usually start with presentations addressing current topics of the cooperation practices—for example, explanations of the documentation—or talks by guest experts of specific time periods. The finds are discussed with experts of various fields, which offer the detectorists a chance to discuss their own interpretations with them. This regular interaction between detectorists and professionals opens the academic discourse to the volunteers. Furthermore, the meetings offer a platform for exchange among the detectorists themselves.

Both parties benefit from the cooperation. Professionals profit from new knowledge that volunteers produce, contributing also in other ways, such as using their private drones or taking part in excavations or survey projects. The cooperation also creates a kind of social control of illegal detecting, because permit holders will notice illegal digging in their area. They are also encouraged to ask other detectorists, if encountered, for their permit. Volunteers profit from gaining experience with academic discursive practices of dating and interpretation or restoration of the finds, and experiencing procedures and routines of knowledge practices in GDKE Speyer. Furthermore, their knowledge practices are taken seriously. In general, both parties are very content.

DOCUMENT FORMS AS BOUNDARY OBJECTS

The standardized document format shows the importance of instruments that facilitate a smooth transfer of information and objects between volunteers and academic spheres. Only recently introduced, it aims to replace informal ways of documenting in handwritten notes or on scrap paper, which slowed down circulation, given that information had to be translated into formats that the databases can process. The standardized form facilitates this by formatting information in ways the databases require. Such forms act as boundary objects—a concept developed by the American sociologist of science Susan Leigh Star and the philosopher of science James Griesemer—which are defined as artifacts that "inhabit several intersecting social worlds . . . and satisfy the informal requirements of each of them" (Star and Griesemer 1989:393). This might include not only material objects but any kinds of material or infrastructural arrangements (Star and Griesemer 1989:118)—for example, methods, practices, assemblages, concepts, et cetera. The ability to dwell in different spheres despite having different meanings derives from having a structure common enough to make them recognizable across these worlds (Akkerman and Bakker 2011:140–141), because they are "both plastic enough to adapt to local needs and the constraints of the several parties employing them, yet robust enough to maintain a common identity across sites" (Star and Griesemer 1989:393), so actors of different backgrounds can agree to working together, using the boundary object as a "means of translation" (Star and Griesemer 1989:393). In the case of the cooperation with detectorists, the standardized form of documentation functions as a successful boundary object, because it is plausible for detectorists and the database alike. According to the questionnaire, almost all detectorists confirm that the work with the form is not problematic, and professionals at GDKE are satisfied with the results. Another example of boundary objects is a digital documentation system. Such a database is currently in the planning stages at GDKE, but in several other countries, some forms of digital databases are already established, such as the Finnish Archaeological Finds Recording Linked Open Database (SuALT), the Portable Antiquities Scheme (PAS) in England and Wales, the MEDEA platform (Metaaldetectie en Archeologie) in Belgium, the Portable Antiquities of the Netherlands (PAN), and DIME (Digital Metal Finds) in Denmark (Dobat, Deckers, et al. 2020; Wessman et al. 2019). In apps, various information categories such as coordinates, photos, and additional information can be collected, which travel immediately into academic databases—and back to the detectorists, when they are given access to academic databases.

SOCIAL BACKGROUND OF DETECTORISTS

Between 92 and 100 individuals answered questions regarding age, gender, highest degree, and residential area. Obviously, the practice of metal detecting appeals to people who are usually less involved in volunteer heritage practices, given that it attracts younger audiences with wider educational backgrounds. Regarding age, the overall majority were between 26 and 55 years old (Table 1). With regard to the highest formal degree, of 92 persons answering this question, only around one-third (31 persons) had a high school diploma or higher degrees (Table 2). Another difference from typical heritage audiences is the gender of the participants. Of the 93 persons who answered the question, 87 were men (Table 3), so the practice of metal detecting seems to be more compelling to male volunteers. Similar observations were made in other countries as well (for example, in the UK, see Thomas 2012). Almost all detectorists came from the state Rhineland-Palatinate. Of the 93 persons answering the question, 84 lived there, and nine came from two neighboring states (Table 4). That is an effect of the structure of the program, because people are encouraged to take areas close to where they live. People from other states can apply, but they would have to travel to their research area.

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TABLE 1. Age.

Age	N	%
Under 18	2	2.15
18–25	3	3.23
26–35	13	13.98
36-45	29	31.18
46–55	25	26.80
56-65	13	13.98
Over 65	8	8.60
Total	**93**	**100.00**

TABLE 2. Highest Degree of Education.

Degree	N	%
Lower secondary degree	12	13.05
Secondary degree	22	23.91
Apprenticeship	27	29.35
High school diploma	9	9.78
University degree	11	11.96
PhD	2	2.17
Master craftsman diploma	7	7.61
Still in school	2	2.17
Total	**92**	**100.00**

MOTIVATIONS

To examine the plausibility of the above-mentioned narrative that volunteers have motivations that are different from those of professionals, the questionnaire asked what the detectorists like about the practice of metal detecting. Given that it was an open question, people used their own words, and most mentioned more than one point. The question was answered by 90 persons (Table 5). Almost all aspects fall into the two categories of history and nature. The overall majority (72 persons) mentioned an interest in history, with around one-quarter (26 persons) explicitly stating the desire to contribute to scientific knowledge production. Ten persons argued that they want to contribute to the conservation of heritage. Six persons explicitly mentioned regional history. Other answers pointed to rather emotional motivations: around one-third (36 persons) described the excitement of finding the unknown: 26 persons referred to the rediscovery of lost objects, six hoped to make an outstanding find, four described the excitement of touching historical objects (therefore signaling the importance of the materiality of the practice), and two hoped to find something beautiful (so aesthetic aspects play a role—although a rather small one—as well).

Nature and related aspects were mentioned by 53 persons, which is more than half of the participants answering that question: 15 persons enjoyed the fresh air, 14 appreciated the tranquility, eight described it as recreation, and seven highlighted the physical exercise. One person connected it with saving the environment, and one wanted to act more consciously in the environment. Regarding detectorists' self-perception, it is remarkable that eight persons described it as a hobby. Three people mentioned the friendships, and three found everything interesting.

TABLE 3. Gender.

Gender	N	%
Men	87	87.00
Women	6	6.00
No comment	7	7.00
Total	**100**	**100.00**

TABLE 4. Region of Residence.

Region	N	%
Rhineland-Palatinate	84	90.31
Baden Württemberg	7	7.52
Saarland	2	2.17
Total	**93**	**100.00**

Consequently, there is a wide spectrum of motivations, but the majority of participants aim to contribute to historical research. More than one-quarter of answers described an interest in academic endeavors. Similar responses have also been noted in other European countries (e.g., Axelsen 2021; Dobat 2013; Ferguson 2013; Immonen and Kinnunen 2016; Thomas 2012; Winkley 2016), so the answers suggest a close connection to academic knowledge production by a substantial number of the detectorists.[6] This gives a more differentiated picture than Jung's narrative of non-scientific motivations.

BOUNDARY MAKING

In order to explore the boundary, the questionnaire asked how detectorists perceive the difference between professionals and volunteers. It first asked whether they see any difference with regard to practices, followed by a space to comment on how they would describe those differences (Table 6). Of 80 persons answering the question, 44—only around half of them—agreed that there is a difference. This shows that the narrative of a boundary is not very influential. Thirty-eight persons wrote a description of how they define this difference, and these answers give an insight into the spectrum of narratives of boundary making. Thirteen persons argued that professionals have more information or knowledge, 10 believed that professionals have more experience, eight thought that professionals are just working in a more professional way, three argued that they professionals have more resources, three believed that professionals have other priorities, and three mentioned level of education. Two people argued that professionals have more time and that they work more precisely; one person saw the only difference in professionals having insurance; and one person pointed to the fact that professionals are allowed to go deeper than the 20 cm the volunteers are restricted to. One person described it as overlooking the big picture. Three persons chose to describe the difference by pointing to the limitations of volunteers: one person saw them as being restricted in their activities, one person mentioned the lack of financial support, and one saw them as being limited to just one area. Two persons described the volunteers' activities as just a hobby, and one person perceived them as doing groundwork for the professionals. Only one person mentioned volunteers having

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TABLE 5. Question: What Do You Like about the Practice of Metal Detecting?

Answers	N
Answers referring to history	
Interest in history	72
Contribution to academic knowledge production	26
Conservation of heritage	10
Interest in regional history	7
Finding the unknown	36
Rediscovering lost objects	26
Outstanding finds	6
Touching historical objects	4
Finding something beautiful	2
Answers referring to nature and recreation	
Nature	53
Fresh air	15
Tranquillity	14
Recreation	8
Physical exercise	7
Saving the environment	1
Act more consciously in the environment	1
Other topics	
Hobby	8
Friendships	3
Everything is interesting	3

Note: 90 persons answered (open question; more than one answer possible).

TABLE 6. Question: Do You See a Difference in Practice between Volunteers and Professionals?

Answer	N
Yes	44
No	36
Total	80
In which way do you see a difference?[1]	
Professionals . . .	
have more information or knowledge	13
have more experience	10
work in a more professional way	8
have more resources	3
have other priorities	3
have the education	3
have more time and work more precisely	2
have insurance	1
can dig deeper than 20 cm	1
have overview of the big picture	1
Detectorists . . .	
are restricted in their activities	1
lack financial support	1
are limited to just one area	1
do it just as a hobby	2
do the groundwork for professionals	1
have more local contacts	1
Both are complementary to each other	2

[1] $N = 38$ (open question; more than one answer possible).

the advantage of more local contacts. And two persons saw professionals and volunteers as being complementary to each other. So obviously, the most influential narratives are the imbalance of information and experience, which seems to be mostly a question of time invested. Some refer to rather technical differences, such as insurance, financial support, or spatial limitations. On the other hand, the idea of being complementary makes the boundary more fluid.

Another way of exploring the boundary between professionals and volunteers is looking at the knowledge practice of volunteers, based on participant observation of field trips of five detectorists. In the following section, I describe the practices of Mark (a pseudonym) as a case study. He did not get his requested research area in his residential town, because there were already several other detectorists holding permits there, so he chose an area the archaeologists suggested—a woodland area not previously surveyed. His goal is to map the whole area, looking for former trails and roads, along with other historical sites. Generally, he aims to follow a specific agenda, not just looking for finds. His main interest is objects of mundane activities, and he is less interested in what he calls "big finds." In preparation for his field trips, he has collected and analyzed all information he was able to access about the area, such as all previous academic literature and old maps. This is combined with a general survey of the area—looking for marks or signs in the field, such as hollow ways—and informal information collected from local rangers. He systematically surveys all sectors that look promising, and he documents his path and the objects he finds with a GPS device, interpreting the finds in order to date the pathways. Generally, he is interested in gaining more experience and seeking an exchange with professionals. He has also attended a training course in restoration. As we can see in this short description, his practice is no different from academic practices: he is guided by the same motivation, he does preparatory research, and he walks the area systematically, documenting all activities. To sum up, as practices as well as the self-perception show that at least some of the volunteers act and perceive their practice as similar to those of professionals, a clear boundary cannot be assumed.

COOPERATION IN COMMUNITIES OF PRACTICE

As we have seen, the boundary between professionals and volunteers is not preexisting but rather actively produced. Consequently, the question of better models for cooperation arises. Here, the concept of community of practice (COP), developed by the American pedagogue Jean Lave and learning theorist Etienne Wenger (Lave and Wenger 1991; Wenger 1998), is very compelling. They define it as a set of relations among persons, activity, and world, over time and in relation to other tangential and overlapping communities of practice. These communities of practice are a site of learning, and they lead to the development of shared practices, conventions, and self-

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TABLE 7. Questions Regarding Cooperation among Detectorists.

Are you cooperating with other detectorists?		
	N	**%**
Yes	45	50.00
No	45	50.00
Total	90	100.00
Question: If yes, in which form do you cooperate?[1]		
Sharing the area with other permit holders	23	
Exchanging information	5	
Private contacts	7	
WhatsApp groups	4	
Teamwork with my brother	2	
Accompanied by friends	1	
Contact with permit member in adjacent area	1	
Restoration	1	
Discussing finds	1	
Helping with documentation	1	
E-mail contact	1	
Do you wish for more ways to be in contact with other permit holders?		
	N	**%**
Yes	37	41.11
No	53	58.89
Total	90	100.00

[1] *N* = 42 (open question; more than one answer possible).

conceptions. The practice defines a community through three dimensions: mutual engagement, joint enterprise, and shared repertoire (Wenger 1998:152). The shared repertoire may include "routines, words, tools, ways of doing things, stories" (Wenger 1998:83) or the development of a common language. Members also develop an identification with the community, which is defined as experience and display of competence (Wenger 1998:152) and which is located in relations among practitioners, their practice, the artifacts of that practice, and the social organization and political economy of these communities of practice (Lave and Wenger 1991:122). The above-mentioned research by Emily Oswald analyzed the relevance of COP in a botanical society's participatory practices and showed that the members of that society are part of a strong COP, bringing "longstanding relationships and a history of engaging in shared practices" (Oswald 2020:12) into the project and that this experience will shape their participation. Therefore, the concept of community of practice is helpful to "describe the processes through which volunteers gain experience and are motivated to continue participating in citizen science projects" (Oswald 2020:12).

Looking at the situation of the metal detectorists of the Speyer program, it seems that no institution for volunteers similar to the botanical society exists, so it seems that no preexisting community of practice can be found. The small number of detectorists who see friendships as a motivation seems to imply that social structures are not important. Of 90 persons answering the question in the questionnaire about whether they cooperate with other detectorists, only 45 agreed (Table 7). So for around 50%, the practice of detecting is an individual activity. That is also due to the fact that permit holders are limited to their area, so they usually go in the field alone. One way to turn it into a shared practice is to apply for an area with other volunteers who already hold a permit. Of the 45 persons who stated being engaged in any cooperation, 23 mentioned sharing their area with others. The rather small significance of social networks is also visible in the question about whether they desire more cooperation among permit holders. Only 37 of 90 persons answering this question stated an interest.

Another indication of the existence of communities of practices is their impact on learning processes. The questionnaire explored this by asking detectorists how they had learned the practice (Table 8). This was a multiple choice question with four prescribed answers, of which any number could be chosen, along with a space for further description. Of the 106 persons answering this question, around 70% (75 persons) claimed that they learned it through self-teaching and experimenting. Almost 50% of them (52 persons) used video tutorials. Almost 30% (30 persons) learned from friends and acquaintances. And finally, around 25% (26 persons) used written manuals. Two persons mentioned other ways of learning: one attended a training course, and one learned as part of working as a lumberjack. So, self-education and experimenting are the most important ways of learning, although a substantial number learned it within informal communities of practices of friends and acquaintances. Therefore, detecting was learned by some in the context of a community of practice, but for most, it remains an individually developed knowledge practice—and obviously, independent of professional spheres. Interestingly, it is a genuine tacit knowledge, given that formal formats of learning play almost no role.

As we have seen, although shared practices among detectorists seem to have influence for some, the majority of detectorists are not integrated into any preexisting COP. But through the cooperation with Speyer, a new community of practice of volunteers and professionals developed, for which the meetings are of central importance. This was also apparent in informal conversations with several persons who stated that they prefer having exchanges with professionals in order to get more academic experience. So at least some volunteers seems to value access to professionals more than they value exchanges with other volunteers. Others are also interested in exchanges with detectorists in order to learn the practice.

TABLE 8. Question: How Did You Learn the Practice of Metal Detecting?

Answer	***N***
Experimenting	75
Video tutorials	52
From friends and acquaintances	30
Written manuals	26
Attending a training course	1
Part of the job	1

Note: *N* = 106 (open question; more than one answer possible).

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CONCLUSION

Participatory practices such as the cooperation with detectorists are of central significance for a general transformation of archaeology into a more inclusive discipline in the sense of shared heritage, going beyond top-down approaches. The cooperation should be based on a general transparency regarding the goals and intentions as well as the reasons for decisions and interpretations. The concept of GDKE Speyer is viewed by the detectorists as very successful, because it aims for transparency in all aspects of the cooperation, perceives the volunteers as equal partners, and operates with a low-threshold access. It attracts a broader pool of actors than average heritage projects with respect to age and education, but this is obviously not the case with regard to gender, given that it is a predominately male activity. The open model chosen by GDKE, which requires no preparation courses but does depend on maintaining contact though the meetings, seems to be better suited in comparison to concept-acquiring courses. This is because it is rather open and equally successful in gaining information that would otherwise remain undiscovered but that is now able to travel into academic spheres.

As has been shown, theoretical concepts can improve practices of cooperation by providing concepts for the analysis of the perceptions and presuppositions of professionals and volunteers, and by serving as a base for developing a deeper understanding of the mechanisms of how these perceptions influence practice.

The theoretical model of COP offers a new perspective regarding collaboration by helping individuals see common ground and avoid dichotomous boundary making. This is accomplished by reconceptualizing the relationship between professionals and volunteers as being members of COPs with shared practices and a shared interest in academic endeavors. The regular meetings in the GDKE program function very well as a site for these communities, because they enable people to stay in contact, facilitate exchange, and develop shared practices in the process. With respect to archaeological practice, supportive environments are needed in which such COPs can emerge so that successful collaborative relationships between archaeologists and various volunteer participants can be established. It also raises the question of how collaborations might be influenced by the practices and interests of volunteers acquired in preexisting COPs, and the importance of trying to incorporate any preexisting COPs into collaborative practices.

The notion of boundary objects supports the analysis of the circulation of knowledge. Successful boundary objects facilitate translation and circulation, as the example of the standardized form of documentation has shown. This suggests the need to identify objects, practices, or infrastructures that act as boundary objects, and to evaluate their boundary-crossing qualities of (for example) digital forms, tutorials, and regular meetings. Furthermore, it is important to think about who has the power to define these artifacts. Ideally, all parties should be involved in the development of boundary objects.

Finally, the concept of boundary making helps to question existing archaeological practices by understanding the concepts and presuppositions of academic epistemologies and how these contribute to boundary making practices. The concept points to the role that boundary narratives might play in the discipline and how these are constructed, and it suggests developing strategies to challenge such boundary discourses by, for example, focusing on common ground and not on differences. As we have seen in the example of Speyer, many detectorists work in a similar way as professionals, and they are motivated by the same goals to contribute to academic knowledge production. Therefore, the boundary between volunteers and professionals cannot be seen as a dichotomous border. Rather, it should be reconceptualized as a translation zone where knowledge circulates and where no substantial differences exist but are actively produced through boundary work. In this zone, communities of practice are established and boundary objects facilitate circulation. Only though questioning current perceptions can new perspectives emerge.

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Data Availability Statement

Data from the questionnaire will be made available after the project is finished: https://www.uni-heidelberg.de/fakultaeten/philosophie/zaw/ufg/mitarbeiter/davidovic_projekt.html.

Competing Interests

The author declares none.

NOTES

1. The second case study explored the cooperation at Burg Wersau in Reilingen, southern Germany, between a local history club and archaeologists from Heidelberg University, Germany. A third case study was planned for a project in the UK, but it had to be postponed due to COVID-19.
2. Jung's analyisis is based on his qualitative research on motivations of volunteer archaeologists.
3. An overview of the various concepts was prepared by a volunteer and presented on his YouTube channel "German Treasure Hunter" (https://www.youtube.com/watch?v=QBwvYACF9Ok).
4. https://www.youtube.com/watch?v=QBwvYACF9Ok&feature=youtu.be. This is also an example of independent volunteer knowledge production. The author has produced several videos about cooperation practices, such as interviews with representatives of offices for historic preservation in the respective German states and with actors of GDKE Speyer (https://www.youtube.com/watch?v=awhDhTFEM_U).
5. During the COVID-19 pandemic, meetings were reduced to small numbers of attendees, or they went online, so research could not be done on the original format. However, the description is based on the situation before COVID-19, given that all actors preferred the former structure.
6. In such a setting, people might even unconsciously feel obliged to mention history or science, but because the question asked about the appeal that detecting had for them, the answers can show tendencies.

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