



Article

The History of Fieldwork

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Abstract: Since the history of fieldwork emerged as a self-conscious area of study within the history of science, especially during the last quarter century, it has expanded its focus on place and practice into an ever wider range of disciplines, social and environmental settings, scales, analytical frameworks, and connections with adjacent disciplines and sub-disciplines. After reviewing some of the foundational scholarly works on the history of scientific fieldwork, this essay identifies and discusses some important recent patterns in scholarship. Historians of fieldwork have increasingly attempted to connect their work to other disciplines such as geography, and to other historical subfields such as environmental history, agricultural history, and the history of capitalism, with increasing success at cross-fertilization despite ongoing tensions arising from significant methodological differences. At the same time, scholars have not only linked their work to a wider variety of social and environmental places, including colonial and postcolonial settings, as well as extreme environments, but have also striven more deliberately to understand the emergence of knowledge through fieldwork at larger scales beyond the local, such as regional, continental, oceanic, and global environments. Scholars have also sought to understand more about the intersection of fieldwork with indigenous, folk, vernacular, and experiential knowledge.

Keywords: fieldwork; field science; place and practice



Citation: Vetter, Jeremy. 2022. The History of Fieldwork. *Histories* 2: 457–465. <https://doi.org/10.3390/histories2040032>

Academic Editors: Volker Remmert, Dania Achermann, Cécile Stephanie Stehrenberger and Fabian Link

Received: 31 May 2022

Accepted: 19 October 2022

Published: 26 October 2022

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1. Introduction

Since the mid-1990s, many historians of science have turned more explicitly toward the study of fieldwork as a set of practices situated in places. The development of the history of fieldwork as a scholarly approach has been largely coextensive with my own career, and I previously authored or edited book chapters or journal articles that summarize the scholarly literature in the history of fieldwork by the early 2010s, when this scholarly literature was reaching a critical mass (Kohler 2010; Kohler and Vetter 2016; Vetter 2016a). For a more extensive discussion of the ample scholarship on the history of scientific fieldwork before the last decades, these works cover far more terrain than I can cover here.

What this article offers, in an effort to reach beyond those earlier overviews, is an updated summary and assessment of scholarship on the history of fieldwork. In this selective and brief review, in order to orient readers who are new to the history of fieldwork to the most important approaches, issues, debates, and discussions, I discuss some key earlier, influential works that treated fieldwork as an analytical category and may have been especially generative in sparking analysis and debate. In the second half of the review, I provide some indication of directions that scholars have been taking in the past several years, especially those who have explicitly engaged with fieldwork in their analysis. Along the way, I also discuss how the authors of recent publications in the history of the field sciences have been reaching out—and could productively reach out more in the future—to other academic disciplines and historical subfields beyond the history of science, such as environmental history, agricultural history, and the history of capitalism.

2. Historians Turn to Fieldwork

While historians of specific field sciences, such as geology, geography, and anthropology, have long reflected on the importance of fieldwork for education and research

within these disciplines, their studies were framed largely within the histories of particular disciplines rather than as a general framework spanning the history of science as a whole. A key moment for the emergence of the “history of fieldwork” as an area of study – stretching across many diverse sciences from the physical and earth sciences to the life and human sciences, and deserving of its own analytical approach—was the 1996 *Osiris* edited volume on “Science in the Field”, co-edited by Henrika Kuklick and Robert E. Kohler (Kuklick and Kohler 1996). As a series published by the History of Science Society and sent to all its members, *Osiris* provided a venue with high visibility for bringing attention to the history of fieldwork. The overall effect of the volume was to demonstrate the wider resonance of studying the history of field practice across a wide range of sciences, as well as some of the analytical issues and advantages of doing so.

“Science in the Field” emerged at a time when scientific practice more generally was at the cutting edge of history of science research. With significant cross-fertilization from the interdisciplinary field of Science and Technology Studies (STS), historians had become increasingly interested not only in the history of ideas and the final products of scientific research, but in the messy process by which science was performed in practice: how science works and gets done, not just what it tells us. This rising interest in the practice of science emerged from the context of social constructivist approaches that foregrounded career building, material culture, and knowledge-making as a social process. Or, to put it another way: how scientific knowledge has been produced, not just the end results. Much of the earlier work in the history of scientific practice was focused on the most iconic of scientific spaces, the laboratory. Laboratory ethnographies proliferated in STS, such as Bruno Latour and Steve Woolgar’s influential *Laboratory Life* (Latour and Woolgar 1979). Historians turned toward primary sources such as notebooks, journals, and internal communications that would reveal evidence of behind-the-scenes production of knowledge in laboratories.

It was perhaps inevitable that studies of scientific practice inside laboratories would eventually lead historians to ask about other variants of scientific practice outside of labs. While scientific work in “the field” has arguably existed for as long as science has existed, the rise of the laboratory to prominence as a rhetorically placeless, controlled environment for producing reliable knowledge has recast “the field” as the messy, complex world outside the lab. This messiness of the field has been important not only for research but also for outdoor education and ways of learning to do science. While some valuable work has continued in the history of laboratory practices—though it is surprising how much we still do not know about laboratories (Kohler 2008)—it is striking just how much more scholarship has been generated about the history of fieldwork since the mid-1990s. It may be true that much of that research in the history of field sciences has not necessarily centered the analysis of fieldwork as a practice, but a lot of it has nonetheless engaged with the history of fieldwork as an approach, to varying degrees. And what that scholarship has revealed is the impressive diversity of tools and techniques, modes of work organization, technologies of place-making, geographical sites, and participants in the knowledge making process for scientific fieldwork.

Despite the wide-ranging topical and disciplinary purview of the history of fieldwork, certain disciplines have been studied especially closely as models for developing important analytical concepts for thinking about fieldwork as a practice. Kohler’s work on the lab-field borderlands in biology is a case in point. After serving as one of the co-editors for “Science in the Field,” Kohler embarked on an extensive research program on the history of fieldwork that was, at first, centered mainly on biology, which experienced an unusually intense debate about methodology around the turn of the twentieth century, with the claims of laboratory microscopy to supplant field natural history in prestige. Kohler’s *Landscapes and Labscapes* (Kohler 2002) analyzed the important methodological debate around lab vs. field practices between the late nineteenth century and the mid twentieth century, in the wake of the rise of laboratory biology (Kohler 2002). By analogizing this historical debate over lab and field practices to a “borderlands”, Kohler accommodated a variety of hybrid phenomena, including straightforward importing of laboratory practices

and instruments into the field (which seldom worked well), “natural experiments” in the field, and adaptation of field conditions to accommodate more exacting, rigorous, and quantitative research methods. He also tracked the career challenges faced by those moving between lab and field. Many of these issues are found in other field sciences as well. Kohler’s book provided an influential model and inspiration for some historians of fieldwork—or, for others, a useful foil against which to position their own research—both within and outside of the history of biology.

A few years later, Kohler published a second, less widely cited book, *All Creatures* (Kohler 2006) that delved more deeply into the field practices of natural history survey in roughly the same period (Kohler 2006). By drawing on environmental history of land use change, and specifically developing the concept of “inner frontiers” to describe the intermingling of settled and unsettled areas where such fieldwork was taking place, Kohler demonstrated how the historical analysis of scientific practice could be extended to collecting and taxonomic field sciences in the own right, apart from the lab-field borderlands. Around the same time, Amanda Rees developed further analytical tools for the history of fieldwork, through her close study of *The Infanticide Controversy* (Rees 2009) in field primatology, which has been another generative discipline to study in the emergence of new conceptual frameworks for thinking about fieldwork. In particular, her idea of a “fieldworkers’ regress” similar to the experimenters’ regress highlighted the epistemic stakes of the many variables and conditions that could be invoked to insure that field observation, like laboratory experimentation, could be endlessly contested (Rees 2009).

By 2010, then, there were multiple exemplars from disciplines such as biology and primatology that treated the history of scientific fieldwork as the central phenomenon for analysis. And these were just a few of the more prominent. The concepts for thinking about the history of fieldwork were being applied to an ever wider range of disciplines and topics, ranging from geology, glaciology, oceanography, and climatology, to anthropology, archaeology, and folklore, even as these disciplines themselves were often thinking about fieldwork as a signature pedagogy. New edited collections of scholarship showcased this diversity, with collections focusing on the production of knowledge in the field at multiple scales from local to global (Vetter 2011), the shared patterns between expeditions and other types of fieldwork (Nielsen et al. 2012), field science institutions ranging those involving movement across geographical space to fixed field stations (Ekerholm et al. 2017), and the spatial dimensions of prominent field sciences such as ecology (De Bont and Lachmund 2017). This emerging research was notably international in both its subject matter and the geographical locations of its authors.

Histories of scientific fieldwork have also become more closely connected with other fields of study, including distinct disciplines such as geography and other historical subfields such as environmental history, agricultural history, and the history of capitalism. In the case of historical geography, especially in Britain, it was the geographers themselves who moved enthusiastically into the history of fieldwork by the early 2000s, as part of a more general effort to demonstrate the relevance of geographical approaches to place in the history of science (Livingstone 2003; Naylor 2005). Historians, for their part, have absorbed the geography of science into their own interpretations as part of the history of fieldwork, and it can sometimes be difficult or impossible to identify a firm line between historical geography and history of fieldwork. Works that have appeared in recent years in the *Journal of Historical Geography*, for example, would often fit just as easily into history journals (e.g., Forsyth 2014).

Cross-fertilization with other historical subfields has also become a hallmark of the history of fieldwork, beginning especially with environmental history. While only scattered references to environmental history are found in the mid-1990s “Science in the Field” volume, most notably in Gregg Mitman’s contribution, more recent histories of fieldwork have drawn heavily on environmental history, and indeed one recent scholarly review of the intersection of history of science and environmental history highlights many published works on the history of fieldwork that blend the two subfields (Hersey and Vetter 2019).

It may be true that historians of science are methodologically more apt to historicize the knowledge that environmental historians often rely on for evidence, but this has not prevented a rich blending in much of the recent scholarship. Such methodological tensions have been less acute for other subfields, but cross-fertilization is still arguably in its early stages for subfields such as agricultural history and the history of capitalism. Nevertheless, recent co-authored overviews of their intersections with the history of science do include many works that fall within the history of fieldwork (Fitzgerald et al. 2018; Rieppel et al. 2018). More pointedly, recent scholarly monographs that blend the histories of such disparate subjects as agricultural science and paleontology with the history of capitalism, include some sustained consideration of knowledge production through field practice, but they are also notable for connecting the history of field science to more general political, economic, business, and cultural history (Pawley 2020; Rieppel 2019). Indeed, making multiple robust scholarly connections outside of the history of science may be the new norm, and a salutary move.

3. Recent Patterns in the History of Fieldwork

In the remainder of this review article, I would like to identify some patterns in more recent scholarship in the history of fieldwork, some of which demonstrates these rich connections to other areas of study, but which sometimes also develops new themes or further develops existing themes from within the history of scientific fieldwork. In addition to the connections noted above, some other recurring issues include a desire to expand the purview of the history of fieldwork to more places, sites, and practices, as well as to consider more seriously the contested interactions between field scientists and those living around their field locations. Sometimes this has taken the form of conflict over land use and other power dynamics in the field. In conjunction with this, historians have taken an increasing interest in other forms of knowledge that intersected in various ways with the scientific knowledge produced through fieldwork. Called variously local, vernacular, folk, indigenous, or experiential knowledge, scholars are more likely than ever before to critically examine the appropriation of other forms of knowledge, or its erasure, as part of the process of scientific knowledge production in the field.

For some, perhaps many, of the field sciences, their own practitioners have developed not only experiential knowledge but also their own folklore surrounding their practices. On the one hand, this could be in part a problem of demarcating science from non-science, as Georgina Montgomery has emphasized in her history of field primatology, *Primates in the Real World* (Montgomery 2015), which also considers other key emerging issues such as the “Africanization” of field science and the development of long-term research projects at field sites (Montgomery 2015), both of which are discussed further below. Yet, it could also be a significant source of identity and community, particularly from the mid-twentieth century onwards, as field geologists and others looked back on an earlier “heroic” frontier era of their own field science (Benson 2022). It makes sense that field scientists would be concerned about the representation of their work practices, whether to the outside world, other scientists, or to one another, and it is likely that such themes will be explored even more in future research by historians of fieldwork.

That classic frontier era of field science itself, situated within the environmental context of the interior American West, was the focus of my own historical monograph, *Field Life* (Vetter 2016b), which makes the case for a diversity of modes of field practice—lay networks, surveys, quarries, and stations—that coexisted in the U.S. Great Plains and Rocky Mountains during the railroad era (Vetter 2016b). By situating these diverse modes of practice in an environmental and technological context, I explore similar issues across all of them, including the organization of work, geographical relations of East and West, the shaping role of the regional environment, the contributions of subordinate workers and local collaborators, and the intersection of scientific knowledge with experiential knowledge. Lay networks allowed distant researchers to harness the collecting and observing powers of people who lived in the field, without necessarily having to travel into the field themselves,

relying instead on the communication and transportation networks. Surveys did require seasonal travel by fieldworkers, over an extensive geographic area, while quarries involved conflicts over land use and intensive vertical exploitation of resources at more localized sites for extraction. Stations, while also localized, were designed to produce knowledge of the environments around them, and not only existed in the borderlands, typically of lab and field, but also necessitated significant building and reconfiguration of place.

Many of the issues and modes of practice that I identified in *Field Life* have been explored more fully, or in different ways, or in different places and times, by other historians of fieldwork. Published one year earlier, Raf de Bont's *Stations in the Field* (De Bont 2015) provides not only a comparative perspective focused on European zoological field stations but also brings out quite effectively the historically contingent differences between field stations, which could have distinctive relationships with the environments around them, despite their common linkage to urban institutions, material connections, and scientific ideals (De Bont 2015). My own work on the biological field stations of the U.S. Rocky Mountains has emphasized just how closely they were oriented to the field end of the lab-field continuum, especially compared to most elite East Coast marine stations such as Woods Hole (Vetter 2012). But in de Bont's work, the station zoologists of western Europe created their own distinct institutions and "relied on mixed practices that indeed borrowed partially from laboratory traditions, but also from those developed in other scientific workplaces" (De Bont 2015, p. 208).

Another leading historian of field stations is Megan Raby, whose *American Tropics* (Raby 2017) follows the station building activities of American field scientists into the Caribbean, including their contributions to the emergence of tropical ecology and biodiversity research, within a colonial and postcolonial context (Raby 2017). In addition, in her article on the Barro Colorado Island field station in Panama, Raby has offered a significant conceptual tool for historians of fieldwork, and field stations in particular, by asking us to think about them as an example of the building of a long-term scientific archive tied to a particular place, and the practices that made such a project possible (Raby 2015). As long-term field sites, stations are particularly well suited to looking at changes over time, whether in the scientific questions being posed or the political, economic, and social contexts in which those stations are situated.

Other historians of field stations in the past few years have further explored empire and postcolonial settings in Ivory Coast on the African continent (Lachenal 2016), and gender, race, and domesticity at a field station in Bermuda (Tonn 2019). Likewise, Nancy Jacobs has fruitfully probed the decolonization of networks of birders in Africa, showing how colonial cultures and field practices were transformed through a close examination of the vernacular knowledges and lives of African birders (Jacobs 2016). At the same time, historians of geography and mapping have also extended previous work on the colonial era into postcolonial settings. Such efforts to "decolonize the map," when focused directly on field practice through surveying, have not always found a sharp discontinuity but rather a striking persistence of approaches toward field work, as shown in the case of African surveyors and draftsmen in the Gold Coast as it became an independent Ghana (McGowan 2017). Together, these newer histories of field stations, networks, and surveying practices have not only extended our perspective geographically beyond the U.S. itself and western Europe, but have also centered questions about colonialism, postcolonialism, and race, and have in many cases brought forward our chronology of field science into the mid-twentieth century and beyond, even as they have differed in their conclusions about how much continuity there has been from the colonial to the postcolonial era.

While all field stations are, in one way or another, situated within a wider environmental and social context, there are some places where fieldwork is undertaken that extend the zone of management and control well beyond a localized station setting and into a national park or other protected area. Recent scholarship by Elizabeth Hennessy and Ashanti Shih, on the Galapagos Islands and Hawaii, respectively (Hennessy 2018; Shih 2019), has intensified the critical analysis of how such "natural laboratories" exist in tension with other

local land uses and meanings. Such research has not only deepened the relationship of the history of fieldwork to environmental history, but also to the social history of conservation areas and political ecology. Megan Raby has further extended our thinking about field science as a form of land use, often with its own transformative effects (Raby 2019), and this opens up more research on the potential for land use conflict between field scientists and others.

The metaphor of nature's laboratory has been extended even further beyond land to oceanic spaces by Antony Adler in a recent book, *Neptune's Laboratory* (Adler 2019), which builds on his own earlier work on the ship as a laboratory (Adler 2019), as well as earlier historians of the oceans as a space for field practice, such as Helen Rozwadowski and Michael Reidy. Likewise, Vanessa Heggie has broadened our perspective on fieldwork in "extreme environments" (polar and high mountain) and in particular the role of human physiology, along with various forms of local knowledge including embodied knowledge, environmental knowledge, and survival technologies (Heggie 2019). Other new tools and technologies, in completely different contexts of field science, include the paper technologies (and personae) of interwar social anthropology (Foks 2020) and the use of sound recording in ornithology (Bruyninckx 2018). The latter, in particular, also opens up new avenues for historians of fieldwork to connect to the burgeoning new subfield of sensory history, which offers exciting possibilities for future research.

Another notable feature of recent histories of fieldwork, already exemplified by many of the works discussed above, has been a deliberate extension of the periodization of field science beyond the classic period of the late nineteenth and early twentieth centuries. In a recent article introducing a special focus section on the history of fieldwork from the mid-twentieth century period onwards, Cameron Brinitzer and Etienne Benson raise intriguing questions about how much new themes and questions may be necessary in order to account for the field science and practice of more recent decades (Brinitzer and Benson 2022). Part of the reason for wondering if revised conceptual frameworks may be necessary for more recent fieldwork is that so many new technologies of remote sensing, tracking, and observation have transformed the practices of field scientists. While, certainly, the fieldwork of the classic period during the railroad era did include significant research in a lay network mode that allowed field scientists to study the field remotely—making use of not only the railroad itself but also industrial-age postal and telegraphic communications infrastructure—it is undeniable that more advanced technologies have generated new opportunities.

Recent historians have offered abundant evidence about how, in oceanography, robots and space satellites have changed the production of knowledge and the social relations around it (Lehman 2018; Lamy 2018), as well as how Norwegian wolf management of the past half century has been transformed by remote counting and measuring (Stokland 2015). Compared to the lay networks of the turn of the twentieth century, remote measurement and sensing in more recent decades do not depend on local people for their operation, or at least not in the same way, and thus they may allow a greater degree of scientific control or uniformity in remote field research. The advent of computers to analyze these remote data, and other objects and measurements collected from the field, has undoubtedly changed how scientists relate to "the field" as well, and the changing ways that scientists think about remotely gathered data in relation to fieldwork remains a fruitful area for further research, as is the significant disruption to fieldwork caused by the SARS-CoV-2 pandemic that began in late 2019 and early 2020.

Yet, it is also true that many field scientists still do engage in site-based field science, however much it may be transformed by air transport, changing postcolonial regimes, and new research questions. Much of the recent scholarship of place in fieldwork from the mid-twentieth century onwards has focused on previously neglected continents such as Africa, where historians such as Julia Cummiskey, Erika Milam, and Amanda Lewis have uncovered new arrangements of "place and practice" that are comparable to the place-making of earlier eras, but with renewed attention to both "Africanization" and responsiveness to local knowledge and practical questions (Cummiskey 2020; Milam 2022;

Lewis 2018). Taking the place-based approach even further, in Laura Martin's environmental history of ecology in the Pacific, she asks how nonhumans may have played a role in the materialization of ecosystems (Martin 2018). Others have continued to ask questions about the practice of field experimentation in community ecology of the second half of the twentieth century (Grodwohl et al. 2018), thereby demonstrating the ongoing relevance and staying power of comparisons between lab and field practices, even in a later period.

One final issue broached by some recent historians of fieldwork is about the meaning of residence in the field. In a recent brief essay, Rosanna Dent asks, "Whose home is the field?" In her view, which is consistent with much of the recent scholarship that has asked about relations between field scientists and the people who live at or around their field sites, we need to think more deliberately about the dynamics of human relations and reciprocal obligations with those who live in the field (Dent 2022). This will undoubtedly continue to be a fruitful area for further research, especially for those who work on the human sciences such as Dent, but also for other historians of fieldwork on plants, animals, and the physical world. Moreover, such discussions will sometimes overlap with concurrent discussions about the human diversity of field scientists themselves, including barriers to the participation of women, people of color, and people with disabilities.

Another historian who has made a recent turn towards thinking about "residence" in fieldwork, albeit from a different angle, is Rob Kohler, whose previous research and writing was so generative for the history of fieldwork. In his most recent book, *Inside Science*, Kohler examines several notable case studies of field researchers engaged in close examination of human and animal communities through long-term residence and observation (Kohler 2019). Kohler's work raises the possibility that not only can a focus on the field as a "home" be important for our obligations to others who live there, but also how that long-term residence in the field has produced a different kind of situated knowledge. While these differing perspectives on home and residence in the field do not always align perfectly, they do suggest that future research in the history of fieldwork may offer avenues for closer connections with other subfields of history, which account for those social and political contexts, and with continuing emphasis on how the knowledge of experience and human relationships has been a vital part of the field sciences, past and present.

Funding: This research received no external funding.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Conflicts of Interest: The author declares no conflict of interest, other than his own participation as one of the scholars whose work is discussed in the article above, which has been clearly indicated.

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