

Picturing Ecology: Photography and the Birth of a New Science

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Worldwide known personalities like David Attenborough made wildlife documentaries one of the main media to visualize more than human life through the mediation of photography, TV networks and storytelling. Among some researchers, the progressive unfolding of these visual media has given rise to what Jim Igoe (2017) calls “nature of spectacle”, where entertainment, environmental policy and consumerism have found a merging point. However, wildlife documentalists were transforming a visual sensitivity inherited from the pioneers of ecology and photography in Britain. These pioneers were trying to create a new view of science and life diversity since the late nineteenth century that remains influential to our current days. In his most recent book *Picturing Ecology: Photography and the birth of a new science*, Damien Hughes invites us to witness the work of those early ecologists that shaped the underpinnings of their discipline as a visual science. Throughout its more than 400 pages, the author, a seasoned field ecologist and photohistorian with decades of experience, develops what he conceives as a “visual perspective” to show us how photography mediated the embodied encounters of ecologists with plants to configure the knowledge objects of one of the most influential sciences of the twentieth century.

Consisting of seven chapters, the book slowly unfolds a composite picture of ecology’s history that Hughes elaborated for his readers. The first four chapters set the theoretical and historical grounds that help to situate one of the most important arguments of the author: the strong visual basis of early ecologists’ practices that facilitated their task of configuring “vegetation” as their central knowledge object. The last three chapters take this point further by paying close attention to the uses of photography in the practices of field ecology, and how photography served as a platform to negotiate common understandings of knowledge objects in ecology. The book is based on visual and textual sources that included notebooks, journals, correspondence, photographs, and publications from early botanists in the United Kingdom and Europe from 1870 to the early twentieth century. According to Hughes, previous work addressing the role of images and representations in science (Amann and Knorr-Cetina 1988; Coopmans et al. 2014; Daston and Galison 1992; Lynch and Woolgar 1990) assumes that the aim of scientific representation is to “render the invisible visible” (p. 9). For Hughes, that means a selective approach that emphasizes the use of extraordinary images at the expense of

historical and scientific context. That is why for him the book seeks to articulate a different perspective that highlights the agency of photographic practices and their role configuring knowledge-claims and objects in the social practices of science.

From the very beginning in Chapter 1, the author quickly distances himself from any essentialist and realist account of photography. This helps him to problematize the commonplace assumption that photography's function in sciences is the progressive unveiling of an objective and transparent record of natural phenomena, like vegetation in the case of ecology. The author's aim is not to engage with that kind of assumptions to criticize them, he rightly does not take that direction, because his efforts are devoted into situating a different departure point to study the role of photography in the practices of early ecologists. This is what enables him to delineate a route for his analysis of the social and epistemological agency of photography in the following chapters. Once paved that way, Hughes can more easily consider the status of photography in ecology as negotiated and contingent. This basically means that photography can raise questions concerned with the formation of disciplines, research agendas and as a rhetorical space for negotiating knowledge objects and evidence.

In this regard, Chapter 2 draws the contours of a visual history for ecology. Taking us back to Alexander's von Humboldt expedition in South America in the early nineteenth century and the first vegetation surveys by British ecologists in the 1890s, Hughes advances his visual analysis for understanding the origins of ecology. As a discipline, it was commonly associated to the scientific study and investigation of "vegetation" in the twentieth century. However, that definition works better on paper than in practice and history. Following Hughes' account, the systematic study of vegetation required in the first place to configure vegetation as a knowledge object. This would be achieved through the different pictorial strategies by Humboldt and other early ecologists, who were trying to understand plants *en masse* and their associations instead of focusing exclusively on individual species as it was typical of botany at that time. The challenge for these pioneers was to turn their field experiences observing plants in the field into compelling evidence informing "vegetation" as a new scientific object. For doing so, they translated their field observations into textual descriptions including different factors considered as important to study vegetation, like for example botanical and physical information. But crucially, it was also important for these scientists to include visual information, which helped them to understand and study vegetation as an eminently visual knowledge object. This represented, according to Hughes, one of the milestones in the disciplinary transition between nineteenth century botany and twentieth century ecology: from the study of isolated species to the study of plant communities by means such as handmade illustrations, photographs, and maps.

These points are stressed in Chapter 3, the longest one, where Hughes examines the contribution of visual practices in developing a scientific community of ecologists. Ecology pioneers like Robert Smith and Arthur Tansley considered it important to develop visual field methods to communicate the basic concepts and legitimacy of vegetation as an object for scientific study. In my opinion, in this chapter Hughes combines in an exemplary way his historical sources with a sophisticated analysis of the social life of photography in the constitution of ecology as a new science. This is without any doubt one of the biggest contributions of the book: a broad and refined understanding of visual practices that can be used in differ-

ent ways for studying the historical trajectories of sciences. As Hughes analyzes it, ecologists exchanged, collected and transformed photos depending on their use and circulation. For example, photos were used to illustrate lectures and communicate ecological concepts, but also to share experiences of field-collecting in presentations, or to document methods used in studies and broadly to create the occasions among ecologists for thinking, discussing, and contesting knowledge about vegetation. In one of the most interesting passages in the book, Hughes shows how photography was important in the excursions of scientific associations to document their activities, which helped botanists participating in these excursions to start *seeing themselves as ecologists* (p. 155).

But not everything in the study of vegetation was straightforward, and photography was not a panacea to unveil vegetation and make it a knowledge object. According to Hughes, many botanists would resist the view of studying vegetation in favor of species studies by the late nineteenth century (p. 197). So, rather than representations of vegetation, photographs were, following Hughes, the means for ecologists to talk and discuss about their studies of plant associations, so they were not used at face value as direct representations of vegetation. That's what Hughes argues in Chapter 4, where he emphasizes the special devotion of ecologists in developing their visual practices. Print publication would be the preferred visual medium for ecologists to communicate their approach to understanding vegetation and plant associations, especially by creating new journals and textbooks. Interestingly, as Hughes' historical analysis shows, the photographic efforts of ecologists did not rely on a unified understanding of how to translate vegetation into pictures. For that reason, the main significance of photography for ecologists at that time was to show ecological work in action. It is, as made *in the field* through the direct study of plants growing together as a complex phenomenon that deserved scientific attention by visual means.

Maintaining its historical orientation, Chapter 5 delves into the practicalities through which "the field" as the privileged place of knowledge production for ecologists was configured. This is perhaps the chapter that could be more interesting for STS readers looking for new directions in the study of images in scientific practices. Rather than focusing on photographs as devices for creating more convincing and persuasive scientific representations of vegetation, Hughes contributes to opening other analytical concerns that investigate the subjective and embodied foundations of ecological knowledge through photography. Taking the case of the use of maps and cameras in early twentieth-century ecology, the author analyses how the knowledge objects of ecology were negotiated through the body movements and observations of field ecologists studying vegetation. In that way, maps and photographs were configured as "prosthetic technologies of affect" (p. 286), which following the author, could record the embodied experiences of ecologists surveying vegetation. This activity basically consisted of choosing and going to a place "in the field" and judging which aspects of its vegetation deserved to be observed and recorded. In short, maps and cameras were central for ecologists to negotiate their embodied activities when observing plants. The use of these artefacts helped ecologists to configure what Hughes calls a "shared visual cognition" (p. 303) which was practiced in the field and facilitated ecologists' aspiration to reach a common understanding of vegetation's nature.

However, this shared visual cognition was shaped by the very material practices of Victorian and Edwardian natural history in which the act of collecting objects, in this case specimens, was

considered synonymous with knowledge acquisition according to Hughes. In relation to this context, Chapter 6 explores the common practices of photographic exchanges between ecologists, in which they shared similar assumptions of photographs' capacities for structuring and communicating ecological knowledge. This chapter is a bit more ambitious because the author argues that not only for ecology but also for natural history, the mediation of photography was common in its role of expressing the embodied experience carried out in fieldwork practices. So, photography besides being used as a visual witnessing tool to share with others what was seen in the field, was used as well to attest the bodily and affective experience of being "in the field". One of the examples provided in the book is the work of Arthur Tansley in the 1930s, whose field practices of notetaking, photography and cartographic sketching were informed by a particular way of walking and working in the field. In this case, according to Hughes, photographs functioned first, as evidence for the ecological knowledge object and second, as a surrogate for the sensory registration of seeing a woodland plant community. In short, photography was both the expression and vehicle for the embodied knowledge-making practices of ecology.

Picturing Ecology demonstrates the importance and value of archive-led research and the potential of photographic history as a tool to study the formation of scientific discourses and practices. It represents a new appreciation of archival work and photographic repositories contribution to a visual history of ecology, just like Susan Leigh Star and James Griesemer (1989) did it in the past studying animal repositories and their role for research in natural history museums. Hughes offers us a rich historical study which besides making a visual history of ecology, serves as a guide to anyone interested in analyzing the role played by photography in the history of sciences. The book may be useful for anyone in STS wishing to understand the histories, visual cultures and ordinary practices that have shaped the use of photographs in scientific practices.

For some STS readers, Hughes' approach is close to ontological approaches founded on the practical analysis of how the reality of entities, like for example vegetation, is sustained by the activities of people, technologies and other than humans. However, Hughes seems to reduce ontological reflections to discussions about what photography and photographs actually are (pp.14, 36, 287, 422). In my opinion, this is a limitation imposed by the static way that ontology is often understood in photography studies and that could prevent dialogues with many of the ontologically inflected STS contributions that are absent in the book. For some in STS (Ashmore 2005; Mol 2002; Woolgar and Lezaun 2013), ontology refers to the practical and sociomaterial arrangements that sustain and make possible the maintenance of knowledge and scientific objects. For that reason, I think it becomes necessary in future research to develop the conceptual nuances able to connect the historical and cultural importance of photography in the sciences, as argued by Hughes, with an STS ontological understanding of photography where what counts both as images and the possibilities of their use are shaped in practical action. This book will certainly inspire future works in that direction, since it brilliantly opens the doors for further studies that for example could analyze the visual and embodied basis of contemporary ecology, especially in the era of remote sensing, where huge volumes of data and their visualization in maps has contributed to our understanding, sense of action and agency in an epoch of pressing and existential ecological issues for life on earth.

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