Meeting report

Fostering the rebirth of natural history

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Natural history as we have known it is in decline. A growing movement is emerging across disciplines, to understand its decline, and nurture its rebirth. A network of like-minded scientists, resource managers, educators, writers and artists—natural historians—recently convened four consecutive Natural History Initiative workshops to move past the forensic study of natural history, and instead focus on solutions, conspiring to identify opportunities that dovetail the practice of natural history with essential needs of modern science and society, and suggest ways forward. This series of workshops occurred at various locations in the western United States during the winter and spring of 2011, and recently culminated in a Synthesis Summit on 20–24 June 2011.

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1. INTRODUCTION

Broadly defined, natural history can be considered the practice of focused attention to the more than human world, the observation and description of nature as the foundational step in science [1]. Many metrics demonstrate the decline of practices that have traditionally been core to natural history. In research, detailed natural history studies, museum collections and research grants containing significant natural history information are undervalued [2]. There are also declines in natural history education from primary through to graduate school [2,3]; in outdoor childhood experience [4]; in access to natural systems by the general public [2,3] and in the amount of free time spent in natural areas [5]. The meaning and potential implications of such declines in traditional natural history practices have been subjects of concern across multiple domains (e.g. [1–5]), inspiring the organization of a series of workshops in 2011.

2. FOSTERING A BROAD DISCUSSION

The Natural History Initiative workshop series (www.naturalhistorynetwork.org), held during the winter and spring of 2011, was designed to foster stimulating discourse not just among scientists, but across the broad sectors of society that have historically engaged with the practice of natural history both formally and informally. The participants’ common goals were to crystallize discussions about the status of natural history that were already occurring, and to identify opportunities for new partnerships and approaches that foster the re-emergence of natural history.

The organizers and participants made significant efforts to bridge worlds, among scientists and non-scientists alike. Within weeks of each meeting, the workshop website was updated with multi-media vignettes (histories.naturalhistorynetwork.org) that captured conversations among participants, creating greater accessibility to the multiple dimensions of workshop discussions. Discussion was seeded by the clustering of workshop participants into themes of ‘natural history in society’, ‘natural history in research and management’ and ‘natural history in education’—however, in practice the participants and organizers comfortably recognized the interdependence among these themes and actively encouraged discussions and projects to cross these nominal boundaries. Workshop participants moved freely across traditional disciplinary limits in both planned and spontaneous small group discussions, about topics suggested by the participants themselves, as well as in larger group meetings throughout each workshop. This self-directed flow across defined groups was facilitated by loose adoption of an ‘open space’ meeting design [6]. In open space meetings, attendees follow the ‘law of two feet’ [6]: essentially, if a participant finds that he or she is no longer ‘learning nor contributing’ in a particular discussion, he or she should move to a more productive place. Accordingly, we present our perspective on the workshop series with no adherence to boundaries, instead highlighting threads that emerged across discussions.

3. IMPLICATIONS OF A DECLINE IN NATURAL HISTORY

A broad consensus among the participants was that a lack of attention to natural history limits our science and our ability to address major societal problems. For example, the vast majority of species are undescribed, with detailed information available for only a small percentage of species [7]. Thus, biological and environmental studies exploit a tiny fraction of their potential. As extinctions and environmental degradation accelerate, we know little about what we are losing or the consequences of such losses, and we have high uncertainty in managing societal impacts. The financial resources available for conservation are affected as well—people who spend less time interacting with nature spend less money on conservation [8].

4. THE LONG LAMENT

The decline of natural history has been lamented by biologists for decades. Some suggest that a fundamental rift occurred at the end of the nineteenth century, when ‘naturalists’ were seen to be at odds with ‘experimentalists’ in vitriolic published exchanges [9], and naturalists became increasingly marginalized. The outcry is particularly compelling when we recognize the serious management errors that have been connected to a lack of fundamental information about organisms or ecosystems, or the staggering extent to which conservation professionals’ need for information dwarfs the extant number of taxonomists and naturalists [10,11].
While the need for natural history knowledge is evident and its decline can be documented on multiple axes, several prominent biologists have emphasized that the historical dichotomies between naturalists and other biologists are artificial and counterproductive [11]. A rebirth of natural history across disciplines is on the horizon.

5. OPTIMISM

One conspicuous reason for optimism is the continuing emergence of technologies that connect people with the richness of the ecosystems in which we are embedded. New tools are increasingly available to augment our human abilities to see, hear, smell, feel and discuss the natural world; thus they facilitate discovery of nature, information sharing, integration and analysis, and enrichment of formal and informal education. For example, automated digital image capture and analysis can harness and enhance the taxonomic expertise that is currently shared by very few individuals, who have insufficient funding for the task at hand; freeing taxonomists from the routine work of identifying known species allows them more time to describe the unknown [12]. Field guides on smartphones assist species identification, and photographs can be uploaded to the Internet for verification. Technological and conceptual advances within the fields of genetics and epigenetics are concurrently producing increasingly refined descriptions of, and diagnostic tools for, genotypes and phenotypes [13,14]; at the interstices of these fields are spectacular opportunities for natural historians to describe the relationships of organisms with environment that cause modifications of gene expression, and the roles of individual phenotypes within populations and communities.

Technologies also are connecting humans with each other in new ways. The rapid development and cultural adoption of social networking technologies have created diverse opportunities for exchange among scientists and non-scientists, allowing them to share knowledge in multi-media formats. Such technological networks have capacity to galvanize communities of natural historians with all levels of scientific training. History has demonstrated repeatedly that important scientific observations are not always made by scientists, but frequently by devoted nature lovers with very different backgrounds [15]. Until recently, most of these observations would have been ‘dark data’ [16]: data that are essentially undiscoverable outside standard scientific channels, and thus unlikely to contribute to the broader understanding of nature. But now technological networks create communities in which such observations have a new power to combine almost instantaneously into collective knowledge of ecosystems and organisms. Combined in increasingly sophisticated analyses and presentation, the synthesis of such collective natural history knowledge serves diverse user communities and reinforces individuals’ commitment to participation [17].

While many of these promising technologies are new to practitioners of natural history, ‘old friends’—such as artists, historians, philosophers and writers—also are being entreated to engage in exciting new partnerships. Deliberately coupling science and the humanities in research projects can create new modes for public engagement in science (e.g. informal education), and also promote an epistemic exchange that is beneficial across fields [18]. An example of the synergies in scholarship that can arise from such an exchange is the call from both philosophers and biologists to ‘demilitarize’ the language surrounding invasive species research, in order to promote more sophisticated public discourse on management and conservation [19,20]. Recognizing that unpredictable benefits can emerge from such cross-disciplinary exchanges, the workshop organizers invited artists to both participate in the natural history discussion and also reflect upon the nature of the natural history discussion itself. The artists who created multi-media vignettes of the meeting participants (http://histories.naturalhistorynetwork.org) thus designed them for multiple purposes: to facilitate communication of workshop activities to the broader community, and also to promote new ways to contemplate the movement itself.

6. THE NEW NATURALIST

What does the new naturalist look like? A single phenotype for ‘the naturalist’ remains elusive. This may be the best possible news; perhaps it indicates that there are more paths leading back to natural history than any individual or group would have imagined alone. A greater diversity of perspectives on nature can only improve our understanding. Mysteries remain in Darwin’s ‘tangled bank’ that should engage outdoor enthusiasts, investigators using new technologies to appreciate the unseen, social networks weaving together broadly distributed observations, engineers and artists seeking design insights, and all in search of a richer understanding of the natural world.

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Meeting report. The rebirth of natural history  S. E. Hampton & T. A. Wheeler  163