

Chapter 4

The Herbarium: An Interior Landscape of Science

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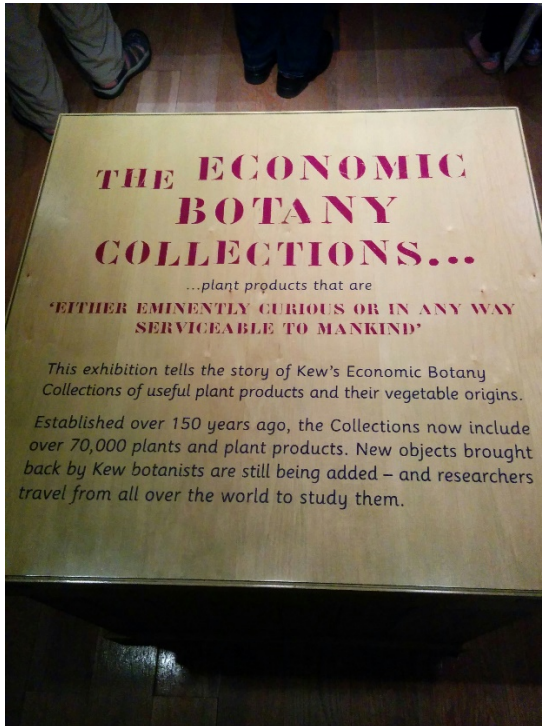


Figure 1. A plaque describing the Economic Botany Collection at Kew. Photo: Peter Anderson.

BOTANY IS A SCIENCE OF MANY PLACES. Ranging from the expeditions of Canadian governmental scientists like James Fletcher¹ and Faith Fyles² to field stations across the British Empire³, and to the network of botanical gardens centred on the Royal Botanical Gardens at Kew⁴, botany reached almost every corner of the globe in the late nineteenth and early twentieth

centuries. Given the great geographical breadth and powerful colonial dynamism of botany in this era, it is easy to overlook what happened to plants after they were collected, transported, named, and planted.

Following other contributions to this volume, this chapter expands upon the historical geographies and environmental histories of science in Canada. It also looks outward to the British Empire at the end of the nineteenth and beginning of the twentieth centuries. Here I focus upon botanical collections rather than the laboratories or the field sites discussed by Stephen Bocking in his introductory essay. To discover the afterlife⁵ of plant specimens collected in the field, we must look at herbaria, where these specimens were preserved, stored, and interpreted according to the conventions of botanical science.

A herbarium, strictly defined, is “a collection of preserved plants stored, catalogued, and arranged systematically for study.”⁶ Herbaria hold key positions in the production and distribution of botanic knowledge. They are far more than just storage facilities for dried plants. As systemized series of specimens, herbaria are important examples of circulating references, where the world is turned into words and knowledge is made mobile. For Bruno Latour, the circulating reference explains how a piece of the world is brought into scientific discourse: “In order to be able to say that *Afulamata diasporis*, a common forest plant, is found in the savanna but only in the shadow of a few forest plants that manage to survive there, she [the botanist] must preserve, not the whole population, but a sample that will serve as a silent witness for this claim.”⁷

The circulating reference isn't every plant of a given species, but the type specimen: a single plant selected as the archetypal example of all plants of that species. Latour notes that “a text speaks of plants. A text has plants as footnotes.”⁸ Just as the documents we use as historians reside in archival vaults, the type specimens live active afterlives in climate-controlled herbaria. Of course, not every specimen in a herbarium is a type specimen.



Figure 2. Part of the National Vascular Plant Herbarium in the William Saunders Building, Central Experimental Farm, Ottawa. Photo: Peter Anderson.

Botanical expeditions that only produce one specimen of each species would fail to meet their goals. While the “discovering” institution might keep the type specimen, other specimens were shipped to other herbaria across networks shaped by contemporary imperial and scientific politics.

Collecting expeditions often produced more material than could be processed in a reasonable amount of time, creating backlogs of unidentified preserved plant material. In addition, the national collections of Britain and Canada were supplemented by donations from a variety of sources. These included other herbaria, military officers and other agents of the state, interested amateurs and field-naturalists, and farmers concerned about possible poisonous weeds in their pastures. Given the haphazard nature of these external donations, custodians of herbaria worked to control material coming into herbaria through a variety of means, including the distribution of how-to guides and manuals. “New” species are still being discovered amongst plant material collected more than a century ago.

Similar to paper documents housed in archival vaults, herbaria maintain strict climate controls to ensure the almost indefinite preservation of plant samples. The National Vascular Plant Herbarium at Ottawa’s Central Experimental Farm, for example, holds samples collected by Upper Canadian author and naturalist Catherine Parr Traill.⁹ The NVPH’s collection has its nucleus in the personal collections of James Fletcher, the first Dominion Entomologist and chief of the Canadian Experimental Farm Service’s Botany Division. The herbarium of the Royal Botanic Gardens at Kew includes specimens dating as far back as the end of the seventeenth century.¹⁰

The organization of herbaria is essential to their function, and goes hand in hand with the naming of specimens. Placing related plants next to each other in the collection facilitates the discovery of relationships and the exploitation of shared properties. During a tour of the Economic Botany



Figure 3. The Herbarium of the Royal Botanic Gardens at Kew during a study visit with the International Conference of Historical Geographers in July 2015. Photo: Peter Anderson.

Collection at Kew as part of the International Conference of Historical Geographers in 2015, our guides described how knowing the genus of plants allowed economic botanists to explore alternatives in times of shortages, or to discover species better suited to the diverse climatic and soil conditions of different parts of the British Empire. The Economic Botany Collection is unusual in that it stores both preserved plant samples, such as the seeds of the rubber tree (*Hevea brasiliensis*), and a variety of end products, which demonstrate the range of industrial applications of the tree's sap.

While necessarily located in strictly controlled indoor spaces, herbaria and similar collections like “avian archives”¹¹ provide windows onto the diverse environments of scientific practice, the politics of collection and exchange, and the importance of preservation to scientific research. Botany, as the science of plant life, isn't confined to the field, laboratory, or herbarium. It brings together a diverse collection of places, people, and plants in an attempt to know a little bit more about the more-than-human world.

¹ Paul W. Riegert, “Fletcher, James,” in *Dictionary of Canadian Biography*, vol. 13, University of Toronto/Université Laval, 2003–,

http://www.biographi.ca/en/bio/fletcher_james_13E.html.

² Beth Robertson, “Faith Fyles: Canadian Botanist and Painter,” Innovation Storybook, *Ingenium Canada*,

<https://ingeniumcanada.org/innovation/story/faith-fyles-canadian-botanist-and-painter>.

³ Thomas F. Gieryn's account of the “discovery” of composting in India by British scientists is illustrative. See Gieryn, “Hybridizing Credibilities: Albert and Gabrielle Howard Compost Organic Waste, Science, and the Rest of Society,” in *Cultural Boundaries of Science: Credibility on the Line* (Chicago: University of Chicago Press, 1999), 233–335.

⁴ See, for example, Richard Drayton, *Nature's Government: Science, Imperial Government, and the "Improvement" of the World* (New Haven, CT: Yale University Press, 2000).

⁵ But how does one determine when a plant, such as a strawberry, is actually dead? While this question is the punchline in the BBC science program *The Infinite Monkey Cage*, plant material, including seeds, has retained its vitality for thousands of years. See "What Is Death?", *The Infinite Monkey Cage*, series 8, episode 1, BBC Radio 4, June 24, 2013, <http://www.bbc.co.uk/programmes/b02ykcwh>; and Rachel Kaufman, "32,000-year-old Plant Brought Back to Life—Oldest Yet," *National Geographic News*, February 23, 2012, <http://news.nationalgeographic.com/news/2012/02/120221-oldest-seeds-regenerated-plants-science/>.

⁶ RBG Kew, "What is a Herbarium?", <http://apps.kew.org/herbcat/gotoWhatIsHerbarium.do>.

⁷ Bruno Latour, *Pandora's Hope: Essays on the Reality of Science Studies* (Cambridge, MA: Harvard University Press, 1999), 34.

⁸ Ibid.

⁹ During a tour of the NVPH, Will Knight and I asked our guide to open a cabinet marked "historical," in which Parr Traill's specimens were stored, unbeknownst to the herbarium's staff!

¹⁰ William Millken, "What's in a Collection? The Herbarium at Kew," Kew Science blog, RBG Kew, <https://www.kew.org/blogs/kew-science/whats-in-a-collection-the-herbarium-at-kew>.

¹¹ See, for example, Kirsten Greer, "Geopolitics and the Avian Imperial Archive: The Zoogeography of Region-Making in the Nineteenth-Century British Mediterranean," *Annals of the Association of American Geographers* 103, no. 6 (2013): 1317–31, <https://doi.org/10.1080/00045608.2013.784095>.