Natural History collecting and the Biogeographical tradition

A coleta na história natural e a tradição biogeográfica

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Great expeditions and scientific journeys carried out the collecting of Natural History material and data. Naturalists changed collected material into museum pieces, diaries, books, maps, letters and so on. As far as techniques, practices, explored areas and personnel are concerned, it becomes evident the fact that material collecting for Medicine has followed the same collecting traditions as Natural History.

KEYWORDS: Natural History, scientific journeys, expedition, fieldwork, Medicine.

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As grandes expedições e as viagens proporcionaram a coleta de material e de dados de história natural. Os naturalistas transformaram o material coletado em objetos de museu, diários, livros, mapas, cartas etc. Do ponto de vista das técnicas e práticas, assim como das áreas geográficas exploradas e do pessoal envolvido, pode-se afirmar que a coleta de material para a medicina seguiu a mesma tradição da coleta em história natural.

PALAVRAS-CHAVE: história natural, viagens, expedições, trabalho de campo, medicina.

One of the most interesting questions in the history of biomedical sciences today is the nature of the relationship between medical collecting and natural history collecting. Is medical collecting the same as natural history collecting? Certainly, the techniques and practices, the geographical areas for exploration, the living beings that are investigated, and often the collectors themselves, are the same. This common identity has had a long and distinguished tradition. For centuries explorers and entrepreneurs have collected living and non-living materials across a wide range of disciplines without worrying whether the specimens are primarily botanical, zoological, medical or anthropological. Or should we perhaps consider that medical collecting and natural history collecting are different because the ultimate aims are so different? It was not the study of disease that drew Alfred Russel Wallace or Henry Walter Bates to the Amazon, but birds and butterflies. It ought to be possible to tease out some of these interrelationships between the specimens collected (the plants and animals, mosquitoes, snakes, fungi, parasites and so on) and the intellectual and practical issues that embrace them. Putting it another way, how does a natural history specimen turn into a medical fact?

Three significant historical factors can be suggested: the people, the practice (fieldwork and theoretical commitments), and the institutional setting. These factors blend together. Hence, it is useful to ask how biomedical collections were made and what they may have represented to the collectors concerned: what in other disciplines would be called the means of production.

People

For centuries there has been a long and passionate love affair between Western naturalists and Brazilian tropical riches, a passion that is well reflected in the title of Victor Von Hagen's justifiably popular book *South America called them*. South America did call them. The talisman of green forests, animals and plants unknown to science, giant creepers and butterflies, the magnificent scenery, indigenous peoples, and much more besides, were a potent attraction to collectors with a sense of adventure and an appreciative turn of mind.[1]

These collectors include Maximillian of Austria, Carl Von Martius, Spix, Wallace, Bates, Darwin, Schomburgk, Spruce, Traill, Louis Agassiz, Charles Waterton, of curare fame, Howard Saunders, the British ornithologist who entered Brazil from Peru and canoed down the Amazon in 1861, and the lepidopterist W. H. Edwards, whose book of travels induced Wallace and Bate to set sail for Pará. The names are well known. Few of these were medical collectors per se, or even medically qualified men. Nevertheless, specimens were acquired, identified, itemised, preserved, and catalogued — these were active craft-based activities situated at the supply end of natural history that gradually

[1] General sources are Reid (1980); Delpar (1980); Parry (1981); Kenneth (1982); Bayly (1989). See also Cameron (1980); Levere (1992); Bowen (1981); Stafford (1984); Livingstone (1984, 1992).

became standardised during the 19th century under the influence of museum specialists and naturalists in the metropolis.[2] Medical materials, such as parasites or ethnological artefacts, were not generally distinguished from more traditional collectable objects such as insects, minerals, or plants.

As the roll of names suggests, these collectors were neither resident in Brazil nor Brazilian by origin or naturalization. The first and most obvious point to make is that the most prominent collectors in historical records were Europeans – foreigners – with all the attendant disjunctions that this fact entailed. As far as a visiting collector was concerned, permits would be required, letters of introduction were needed, as well as regal or diplomatic permissions, or perhaps acquiescence from a friendly steamship company. Banking arrangements had to be made, storage and transport facilities to be arranged, and so on. As far as the indigenous population was concerned, there were cultural misapprehensions, language barriers, and exposure to some, if not all, the manipulations and exploitations, commonplace in the age of empires and the expansion of European power.[3]

During the colonial era, these encounters were expressed in ways that have long interested historians of natural history. Ownership of the objects collected is a case in point. European collectors rarely gave duplicates of their natural history specimens to local institutions or to appropriate figures of authority, such as the mayor or physician. On the contrary, their intention was to take the material away with them. Collections were possessions, often imperial possessions, whose meaning was not readily apparent to developed nations until either the objects or information about them were relocated in a scientific setting.

Sometimes the intended repositories for Brazilian material were the great museums and institutional bodies of European or North American cities, as was the case during British naval voyages in the 19th century or the plant collecting expeditions sent out by the Royal Botanical Gardens in Kew (Desmond, 1982; Stearn, 1981; Sheets-Pyenson, 1988; Grove, 1995; McCracken, 1997; Drayton, 2000). Charles Darwin, for example, had no intention of giving any of his Latin American specimens to local institutions or local residents, some of whom were even English by origin. Acquiring specimens was his reason for being at sea, his reason for existence (Browne and Neve, 1989). Without them, his voyage was pointless. Darwin wished to make a reputation by distributing them to taxonomists in research-based museums on his return to Britain (Desmond, 1985, pp. 153-85, 223-50).

This held true for many others. Sometimes a collector would intend selling his or her specimens for profit while also expecting to advance some small quarter of scientific knowledge and hoping to enhance his or her personal career trajectory. Wallace and Bates were a good example of the case in point. Some collected explicitly to sell, as the orchid hunters sent out by the London firm James

[2] Discussed in part in Allen, (1978); Barber (1980); Thomas (1983); Lloyd (1985). In relation to Brazil, see especially Monteiro de Carvalho et alii (1999).

[3] The point is made in several exemplary studies on the intermeshing of science and empire. For Brazil, see Thielen et alii (1991). For more general accounts see MacLeod (1982, pp. 1-16, and 1992, pp. 260-285); Reingold and Rothenberg (1987); MacKenzie (1990); Petitjean, Jami and Moulin (1992); and MacLeod and Rehbock (1994). Noteworthy studies in associated areas are Crosby (1986); MacKenzie (1988). Stafford (1989); Secord (1982, pp. 413-42); Lucas and Lucas, Darragh and Maroske (1994, pp. 65-88). (1982, pp. 413-42); Lucas and Lucas, Darragh and Maroske (1994, pp. 65-88).

Veitch and Sons. Even Margaret Mee made use of her paintings for commercial purposes that blended indistinguishably into courting public recognition. On occasion, natural history specimens remained the property of the commercial company or business concern that employed the collector, as Magali Romero Sá (1998) has shown us in her study of Traill's prospecting work for the Amazon Steamship Company. In these cases, the collector was required to follow instructions. Severe reprimands would be issued by the employer if the required itinerary had not been fulfilled. These networks of employers and beneficiaries, of purposes and intentions, are the most obvious face of transatlantic relations that were at root deeply exploitative.

Local people were involved in these collecting enterprises, but usually only as employees of one kind or another. Such people are frequently hidden from the historical record. It is becoming increasingly obvious to historians and South Americanists that European and North American collectors could not have achieved any of their results without the aid of residents as well as guides and trackers. Most of these assistants are now invisible: they have been written out of the story in much the same way as laboratory technicians are often regarded as inconsequential in scientific history. Steven Shapin dubs them the invisible technicians. Occasionally, some record of their participation was left. Wallace described his assistants in Brazil and Malaysia, describing his Malaysian assistant in detail and calling him by name in his book *The Malay Archipelago*. So did Bates. So did Darwin, but only in passing. In Brazil, Darwin hired an Indian boy to lead him into the jungle and climb trees for him; and we know that his English-born servant Syms Covington helped catch and prepare specimens throughout the rest of the *Beagle* voyage. Collectors depended on such advice. Otherwise, they would never have known where to find the best tropical pool, the finest stand of trees, or the curious outcrop of rock in the rainforest. Europeans consequently travelled in large parties including guides and assistants. They often took lodgings for a length of time in convenient places and paid for specimens such as snakes and birds that were brought in. Something of a local economy could emerge in which new travellers sought out guides from previous expeditions. These reciprocal arrangements clearly benefited everybody concerned. But it should be noted that few of these helpers received any recognition for their services, a reflection of the structure of society at that time.

Such collecting expeditions occasionally had notable social effects. When Louis Agassiz collected along the River Amazon in 1865 and 1866, he persuaded Dom Pedro II, the emperor of Brazil, to allow women to attend his lectures on natural history topics in Rio de Janeiro, the first time women went to public meetings at which men were

present. Two years later, Pedro opened up the river to international commerce.

Practice

Several decades ago, in 1976, David Allen set a fine example for historians with his *Naturalist in Britain*, which established the need to examine closely the social practices surrounding all forms of collecting activity. More recently, the essays *Cultures of natural history*, edited by Nicholas Jardine, James Secord and Emma Spary (1996), reveal the new strengths of this field; see also Pratt, 1992). Simultaneously, the prestigious journal *Osiris* (2d ser. 11, 1996) published a collection of important articles on science in the field. The relationships between collector and the collected, objects and their shifting meanings, have become highly topical areas of inquiry.

These studies make it clear that tropical collecting was a nasty, difficult endeavour in which organisms were found and killed, and naturalists suffered extreme deprivation and hardship. There were many dangers, as Bates remarked after wrestling with an alligator intent on joining a campsite on the banks of the Amazon. On 22 October 1833, Darwin was bribing a civilian guard to let him creep out of a blockade in Montevideo. Explorers required special protection and their safe return to their homeland was rightly celebrated by families and friends. Sometimes it was sufficient for a man or woman merely to survive.

Nevertheless, a code of practice for packing and recording specimens emerged, journals were kept and returned to Europe at intervals. Before the general use of Wardian cases in the 1840s, living plants required constant attention. The development of craft skills in natural history collecting and the tacit knowledge generated by informal training and self-experience in such endeavours should not be ignored (Camerini, 1997, pp. 354-77).

Underpinning these activities, there lay extremely strong scientific assumptions. For the most part, there was a strong commitment to the idea of geographical regions. Everybody who collected was deeply imbued with ideas about the geography of distribution, the patterns, the dispersal and habitat of the species under investigation.

To some degree this ought to be expected. The location where an animal is first found is frequently enshrined in within the Linnean taxonomic scheme as a fundamental diagnostic character, and the given name often reflects its geographical situation, in colloquial terms just as much as in scientific binomials. The concept of global bio-geographical regions also came to the fore in the 19th century, in part a natural mirror of the imperial mode of thought, but also crystallised by naturalists emphasising the existence of geographical units of plant and animal life. In the era before the terminology and fundamental principles of ecology and bio-geography were codified there these

biogeographical units were perceived most clearly as floras and faunas, islands and mountain habitats, river banks and rainforests, all of which were accepted to be units governed by climate, topography, and history (Browne, 1992, pp. 453-75, 1983). People would attempt to collect a representative suite of specimens from indigenous faunas and floras: collecting in depth as well as in topographical extent. The concept of regionality emerged as an essential component of the collecting enterprise.

One well-known example will suffice. Alexander von Humboldt's comparative studies of the physical and biological characteristics of regions led him to devise the system of isothermal lines, which on a map delineated areas subject to similar conditions (Nicolson , 1987, pp. 167-94).

Decades later, Alphonse Laveran utilised these to map the geographical distribution of malaria against temperature in order to show that the disease was not a consequence of atmospheric conditions but of active biological vectors that lived in particular places, that is mosquitoes. Luigi Sambon set out to persuade the medical public that parasites — rather than tropical climate — were the primary cause of the disease.

The most significant period in the life — and death — of a Victorian collection therefore, came with its arrival in some scientific establishment where its properties could be collated and analysed: as Bruno Latour suggests, these centres of calculation were the places where data and objects were turned into acceptable scientific facts.[4] Such establishments were not always located in Europe or North America. Sir Henry Wellcome's research ship, dating from 1913, was a floating laboratory cruising the Nile. But mostly, European scientists operated under an old-style imperial notion of centre and periphery, where the centre was the proper place to convert natural history objects into scientific facts. Processing information in a laboratory was central to this approach.

[4] Latour (1987), on the transformation of texts into "things". La Perouse's geographical work on the Asiatic Pacific rim is taken by Latour as a case study in how native beliefs can be converted into certain and justified knowledge even though La Pérouse failed to return to Paris.

Conclusion

Collections involve not just the material object but also the resulting knowledge product, the books and articles, the equipment, maps, letters, diaries and notebooks. Historians must investigate how these factors come into proximity and the trajectories that take both the collector and the objects to scientific recognition in the metropolis: the conversion of raw materials into scientific data and reputation. On a vigorous global stage, it is no surprise that collecting endeavours fully reflected the developing infrastructure of European empire-building. Collecting expeditions were invariably drawn up to fulfil complex administrative and national purposes in which scientific exploration and the glamour of discovery were constituent parts. When collections like these arrived in Europe and were placed in museums in Paris, London, Amsterdam,

or Berlin, they provided a visible display of the investigator's erudition and power — national power, geographical power, and scientific power, all closely combined. Natural historical and ethnographic specimens were explicitly transformed into representations of Western knowledge.

We can see that medical collecting probably falls into the same category. The historic biological collections that remain in existence today, that is, the insects, fungal, parasitological, and protozoological specimens drawn from inter-tropical regions and shipped overseas to institutions such as the School of Tropical Medicine in Liverpool, clearly provided the basis for studying the causes and modes of transmission of diseases such as yellow fever, hookworm, malaria and so on – diseases and infections whose identification defined tropical medicine in the late 19th and early 20th century (Arnold, 1988; Curtin, 1989; MacLeod and Lewis, 1988).

More recently still, collections are regarded as crucial evidence in assessing human impact on developing areas of the globe and provide important resources for evaluating bio-diversity and bio-prospecting. In all these areas, the natural history tradition has much to tell us about biomedical collecting.

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