What is Theory

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In her introduction to her edited anthology, *Biographies of Scientific Objects*, Lorraine Daston generalises the authors' positions in terms of:

> '… assigning scientific objects a different kind of reality than that set forth in the conventional two-valued metaphysics that obliges us to choose unequivocally between "*x* exists"/"*x* does not exist" or "*x* is discovered"/"*x* is invented'. Reality for scientific objects instead expands into a continuum, just as degrees of probability opened up between poles of true and false in seventeenth-century philosophy. Scientific objects may not be invented, but they grow more richly real as they become entangled in webs of cultural significance, material practices, and theoretical derivations. In contrast to quotidian objects, scientific objects broaden and deepen: they become evermore widely connected to other phenomena, and at the same time yield ever more layers of hidden structure. The sciences are fertile in new objects, and the objects in turn are fertile in new techniques, differentiations, representations, empirical and conceptual revelations. The participle "in the becoming" is more than a quaint rendering of Aristotle's Greek *(genesis)*. It captures the distinctively generative processual sense of the reality of scientific objects, as opposed to the quotidian objects that simply are. But what can be ontologically enriched can also be impoverished; scientific objects can pass away as well as come into being. Sometimes they are banished totally from the realm of the real, as in the case of unicorns, phlogiston, and the ether. More often they slip back into the wan reality of quotidian objects, which exist but do not thicken and quicken with inquiry.' (Daston, 2000. p. 13)

Dalston's examples are from: 'physics, economics, psychology, biology, anthropology, demography, medicine, sociology, mechanics, and sciences that no longer have a name' (Ibid. p. 3). It is true, of course, that quotidian objects also become widely entangled through their recruitment in literature and other media, but these forms lack the discipline of 'science' that is exerted through academic conferences, peer review, university examinations as well as school and university syllabuses. Rather than 'scientific'/'quotidian', I tend to use the anthropological terms, 'etic' and 'emic', or even 'theoretical' and 'empirical' in respect of which 'only theoretical objects may be discovered; an empirical object is merely encountered.' (Dowling 2007; p. 191fn.). Here, the distinction is between that which is known and already linguistically available, and that which is, at the time of the encounter, unknown and needs to be cognitively/linguistically developed.

By 'object's, I am referring to conceptual objects, rather than things, signs rather than their referents, though we might include things in the category of 'empirical objects'. In general terms, 'theory' refers to general claims, statements that are in abstraction from the empirical, which concerns local instances. Observations can be made of empirical, which is to say, local objects. So how are general observations achieved? In a chapter in another anthology edited by Dalston (this time with Elizabeth Lunbeck), J. Andrew Mendelsohnn (2011) offers an eighteenth century example of this process in the context of medical and meterological observation. Mendelsohnn reports that thousands of medical reports, case studies and bedside observations submitted centrally and '1.3 million individual acts of meteorological observation that were fused into […] general observations', so how was this fusion achieved? Mendelsohnn describes three strategies, extract, précis and table via the technology of the questionnaire:

> … The organizational forms for operating the enquiry, were a kind of collective, the kind it took to make a general observation, the kind that made such an observation thinkable. This differed from the kind of collective that made *observationes* and collected them: the medical and scientific republic of letters, a collegial network of authors writing, exchanging, collecting, organising, and commenting on case histories. By contrast, the society's observers, though volunteers submitting their observations as "correspondence" by post, were caught in a centralized web rather than being points of intersection in an epistolary network. The more they gave up the voice of the author for the more voiceless work of the extractor, the more they gave up the virtuoso observer's autonomy to the templates of detailed questionnaire and tabular form, the more they and their observations could succeed in becoming part of general observation. (Mendelsohnn, 2011, p. 417)

The tables did not, in the main, involve numbers, but did involve verbal, ordinal quantification (more, less, and so forth and the *observations* themselves were already abstractions from the sites of observation. So, the moves from *observationes* to tables was in the same direction as the move from the empirical to the theoretical, from the local to the general, but a move that did not go all the way. What is lost in this move is local detail and authorial idiosyncrasy. Further standardisation is possible with the development of statistical methods from the mid-nineteenth century (MacKenzie, 1981).

The redaction that reduces the observation to extract is present in contemporary qualitative analysis as well. This is fundamental in conceptualising in Grounded Theory (Glaser & Strauss, 1965) and in thematic analysis (Braun & Clarke, 2006). A key distinction to be made between many approaches in qualitative and quantitative research is in the point at which conceptualisation occurs. Surveys and experiments, for example, generally require conceptualisation to take place prior to data collection. This is explicitly the case with pre-coded questionnaires but also in structured observation and in experiments that aim to measure the impact of A upon B—you clearly need to know what A and B are to begin with. Much qualitative research does not operate like this at all. Rather, the researcher must distil concepts from their fieldnotes or transcripts or from other sources of qualitative data, written or multimodal texts, for example.

In general, quantitative analysis produces associations or correlations between variables, but this does not usually allow the inference of causality. For example, there is a widely recognised association between hair colour and age that has been known about for a very long time indeed, but what causes hair to turn grey? Well, 'scientists may have discovered' the answer.[1] This answer is expressed in the language of stem cell research that describes the possible mechanism, not simply a correlation, which also allows for the possibility that some people's hair may not turn grey as they age and may also facilitate the production of a technology that can reverse the process.

References

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[1] https://www.theguardian.com/science/2023/apr/19/scientists-may-have-discovered-why-hair-turns-grey?CMP=share_btn_link

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