Scientific Classification

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It is often supposed that one of the goods delivered by successful science is the right way of classifying the things in the world. Surely there is something right about this: any body of scientific knowledge will include ways of classifying, and will not serve its intended aims unless the classifications it embodies reflect real differences and similarities in the world. The standard paradigm for such a successful scientific classification is the periodic table of the elements.

But there is also much potentially wrong with the supposition just mentioned. Most importantly, there is a highly questionable implication of there being some uniquely best classification. Classifications are good or bad for particular purposes, and different purposes will motivate different classifications. It may be that there is such an ideal classification for chemistry, but if so it is because of the specific aims implicit in the history of that discipline. Chemistry aims at the structural analysis of matter and if, as appears to be the case, all matter is composed of a small number of structural elements, a classification based on those elements will be best suited to these purposes. It is also often the case that chemical structure will be the best guide to the properties of kinds of matter. But not necessarily. Two quite distinct chemicals are referred to as 'jade' and despite some serious debates on the issue, Chinese jade carvers have decided that both are real jade (LaPorte).

This illustrates the general point, which becomes much more obvious when we move from chemistry to biology, that classifications devised for different goals can be cross-cutting and overlapping (Dupré, 1993, part1). There remains among many biologists and philosophers the hope of finding the ultimate and uniquely best classification of organisms, most recently conceived in terms of the speciation processes of Darwinian evolution (e.g., De Queiroz, 1999). However, it is at the same time becoming clearer that there is very likely no such ideal classification. There is no reason why a classification that reflects the origins of the things classified should coincide exactly with one aimed at the ecological relations of those things, and it is increasingly perceived that these can and do diverge (Dupré, 2002, chs. 3-4). This possibility becomes even clearer in view of the difficulties that are emerging in the project of evolutionary-based classification. Speciation was once seen as an all or nothing affair leading to complete isolation of one group form another. It is now clear that for micro-organisms, in particular, there is very little such isolation, and genetic material moves in many ways from one kind of organism to another. In fact it has become common to conceive of the genome of an ecosystem (the soil of an area, or a body of water) rather than the privatised genome of an individual organism (see e.g. Venter et al., 2004). The classical picture of speciation applies quite well to some of the most complex multi-celled organisms, such as mammals and birds, though much less well to plants. An important movement in biology is to transcend the anthropocentrism that takes the peculiarities of our own corner of the living world as the model for all.

The recognition that even within science there is no objectively given classificatory order allows the realisation that there is nothing inherently inferior about the biological classifications developed by non-scientific folk for non-scientific purposes. This point has been obscured for philosophers by the highly influential proposal by Hilary Putnam (1975) that ordinary language terms for naturally occurring kinds of thing or stuff were primitive attempts to refer to the kinds that science would eventually delineate more accurately. My own view is that science is generally quite unable to do this, and that ordinary language terms are generally just fine as they are for the purposes fore which they have been developed (Dupré, 2002, chs. 1-2).

A graphic illustration of what I have in mind here can be gained from reflection on the wisdom taught to all young children that science has discovered that whales are not fish. No doubt this wisdom long antedates Putnam's proposal, and shows that such intuitions about the achievements of science are widespread. Nonetheless it is very difficult to provide a convincing rationale for the 'discovery' that whales are not fish. 'Whale' in ordinary language refers to all the members of one branch of the family Cetacea (the Baleen whales) and the larger members of the other branch (the toothed whales). The smaller members of the latter group, dolphins and porpoises, are not generally referred to as whales. Large cetacean is not a concept that has any great biological significance. 'Fish' is much worse. Even assuming it doesn't encompass shellfish or jellyfish, there are three groups of aquatic vertebrates generally thought of as fish, but groups that have diverged for hundreds of millions of years. In fact a lungfish, being part of the aquatic lineage from which terrestrial vertebrates evolved, is more closely related by descent to a whale (or, for that matter, a human) than it is to a salmon or tuna. In short, since these are not significant scientific terms it is impossible to see how science can have discovered facts about their reference.

A final problem with scientific classification raised by the formulation with which this note began, is that ‘things’ are often distinguishable only after classification, rather than presenting themselves to be classified in full-fledged thinginess. So for example it is obvious to common sense that a tree is an individual thing. But from one biological perspective a copse of elm trees, all suckers from the same root system, should be seen as a single individual. A more interesting example is the recent development of the concept of a gene. The more science finds out about the workings of DNA inside living cells, the harder it is to find principled ways of dividing the DNA into components suitable for classification into anything related to the historical meaning of ‘gene’ (Moss, 2001, Stotz Griffiths, and Knight, 2004; Dupré 2004). Of course this is not normally a problem for molecular biologists in the context of their professional lives, but it can lead to serious misunderstanding of many things they say.

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