TITLE : Crosscutting Natural Kinds and the Hierarchy Thesis

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Abstract:

It is often argued that Natural Kinds form a hierarchy: if any two kinds overlap, then one must be subsumed under the other as a subkind (Hacking 1993; Kuhn 2000; Ellis 2001, 2002). If crocodiles and humans are classified as *vertebrates*, and humans are classified together with gorillas as *mammals*, then gorillas and crocodiles should also be classified together under one of the categories (in this case vertebrates). Thus, the kind mammal can be subsumed as a subkind of vertebrate. This paper examines whether the existence of crosscutting categories in scientific taxonomy can be reconciled with the hierarchy thesis (HT).

There are several cases of crosscutting categories in biological taxonomy. Humans and dogs are classified together as *mammals*, and dogs and crocodiles are classified together as *quadrupeds*. However, crocodiles and humans cannot be classified together as either mammals or quadrupeds. Given the hierarchy thesis, the quadrupeds would have to be rejected as a legitimate kind category (Khalidi 1998 : 102).

In contrast, chemical kinds are taken as paradigmatic examples of natural kinds. Chemical kinds are categorically distinct; in so far as each chemical kind is individuated in terms of its atomic number (the number of protons in its nucleus). Since, a given atomic number is unique to each element then classifying the elements is simple. Moreover, in principle, higher-level chemical kinds (e.g. molecules and macromolecules) are mereologically related as wholes to their composing elements. Thus, classification of the composing parts should suffice for classification of the whole. The composing parts will be subsumable as subkinds of the whole. Chemical taxonomy would appear to support the hierarchy thesis.

However, cases of crosscutting categories abound in chemical taxonomy too. For example, diamonds can be classified together with cell membranes as *crystals* and diamonds can also be classified together with glass as *solids*. However, cell membranes and glass cannot be classified together either as crystals or as solids. Crystals are not a subkind of solids and solids are not a subkind of crystals. However, classification in terms of these two categories is scientifically informative. Metaphysical accounts of natural kinds must take such cross-classifications into account.

Some realists acknowledge the existence of crosscutting categories in science, but nevertheless maintain HT. They argue that crosscutting categories do not delineate "Real Kinds" in Mill's sense (Hacking 1993). Others argue that because equally legitimate categories crosscut each other, then the ideal of a taxonomic hierarchy of natural kinds ought to be rejected (Khalidi 1998). Others argue that crosscutting categories lend evidential support for pluralism (Kitcher 1984; Dupré 1993; Ereshefsky 1992). This paper argues that HT ought to be rejected. *Pace* Hacking, I argue that crosscutting classifications delineate natural divisions. I conclude that Realism without the hierarchy thesis can be maintained.