FIBROUS CUMMINGTONITE IN LAKE SUPERIOR: DISCUSSION

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The paper by J. R. Kramer (1976) describing work on fibrous cummingtonite in Lake Superior is important because of the possible health hazard associated with this material, whether its source be taconite tailings, river transport, or both. The concentrations of fibers reported are similar to those we have found by our own investigations which are to be published. Questions of whether or not this material presents a similar hazard as does commercial amosite asbestos, and what are the effects of ingestion as distinct from respiration are the subject of much controversy, and experiments to answer these are crucial. We wish only to make the point here that such controversy and experiments are not served well by misuse of terms such as is found in the above paper.

Terms describing crystal habit are not precisely defined by mineralogists, but there is some sort of agreement in general usage about the sequence of length/breadth aspect ratios denoted by 'prismatic', 'acicular' and 'asbestiform'. Kramer states "Acicular cummingtonite has been associated in occupational health studies with respiratory disease as well as pleural cancer (Selikoff 1972)", but the latter paper was concerned with amosite asbestos. Amosite asbestos has not been described by geologists as 'acicular' and acicular cummingtonite in the taconite would not be, and has not been, described by geologists as asbestos.

In the paper under discussion Kramer describes the cummingtonite as 'fibrous'. This term, though more subjective, has been used generally for the range beyond 'acicular' and into and including 'asbestiform'. In the context of studies of health hazards, however, a fiber has been defined as having an aspect ratio greater than 3:1 and Kramer therefore uses the term appropriately. He is mistaken however in his paragraph: "An asbestiform mineral is defined as any crystalline substance (giving an electron diffraction pattern) with a viewing length to width ratio of 3 or greater. Therefore, in the general environment, about 40 commonly-occurring minerals can be classified as asbestiform minerals." This definition applies to the term 'fiber' not 'asbestiform'.

It is no doubt very necessary to ascertain whether or not a 3 μm$\times$1μm cleavage fragment of an amphibole or pyroxene or other mineral is a potential hazard, but it is neither necessary nor useful to call it asbestiform or asbestos.

References

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