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OLD MINERALOGICAL TECHNIQUES*

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In looking back over the years at the addresses given by my esteemed predecessors I was struck by the great variety of subjects covered. Many of these presidential addresses have dealt with the application of mineralogy to various geological problems; others have traced some of the history of our science in Canada; one asked us to examine our social consciences; and one — that of the late but still remembered Wilson Moorhouse — was set to verse. The talents of mineralogists seem to be endless. My problem of choosing a subject on which to talk was solved when I realized this. For in spite of the seemingly endless talents of mineralogists, there seem to be some talents which are ending, or which are being jealously guarded as personal property. I am referring to certain mineralogical techniques such as morphological crystallography, optical mineralogy, and various other techniques which either separately or together can provide much information about minerals.

Please understand that I am not suggesting that we should return to the 1920's and 30's and forget about such important tools as X-ray diffraction and the electron microprobe. What I am saying is that we should not forget that some of the "old" techniques are still useful. Might it not be better to attempt an optical identification of an unknown mineral before a complete microprobe analysis is performed?

Why waste time measuring the angles between crystal faces? After all, the time required for the determination of an entire structure is being reduced constantly, so why bother with these old-fashioned angles? One of the fundamental features of a crystal is its outside. If one wants to communicate to another mineralogist the appearance of a particular crystal, a crystal drawing is the most straight-forward way. Without a knowledge of the interfacial angles of a crystal, the task of drawing that crystal is an impossible one.

What about the whole area of descriptive mineralogy? Are the rudiments of this subject really being taught as much as they should be? Many mineralogists will say, "Why bother? Descriptive mineralogy is *passé*". If this is true, reconcile these facts for me. Using Mike Fleischer's 1975 Glossary of Mineral Species with Max Hey's "Index" and its two supplements, some interesting facts about the growth of the Mineral Kingdom emerge.

Prior to 1800 less than 100 valid mineral species were known. If we look at the numbers of minerals described each year from 1800 to the present, the annual "production" generally increases. From time to time there are sharp increases (some associated with the publication of new mineralogical compendia) and sharp decreases (often associated with major wars). If we add up the number of species for each 20-year period many of these peaks and valleys are masked and we see the following:

*MAC Presidential address delivered at the MAC Luncheon on May 21, 1976, in Edmonton, Alberta.

PERIOD	NUMBER OF SPECIES
1800 - 1819	87
1820 - 1839	167
1840 - 1859	180
1860 - 1879	200
1880 - 1899	193
1900 - 1919	178
1920 - 1939	256
1940 - 1959	342
1960 - 1973	575

Note that the last entry covers only 14 years, not 20. If we look at part of our present century in more detail we see the following:

PERIOD	NUMBER OF SPECIES
1920 - 1929	136
1930 - 1939	120
1940 - 1949	93
1950 - 1959	249
1960 - 1969	388
1970 - 1973	187

These figures speak for themselves — the number of mineral species described annually is increasing at a greater and greater rate. As Canadians we can be quite proud that a significant number of these new minerals are being described by Canadians, many of whom are in this room today. Although we can be proud that most of the descriptions by Canadians are good, it is disturbing to note that sometimes there are glaring discrepancies present. For example, it is difficult to excuse inconsistencies in optical data such as the wrong value of $2V$ for a particular set of refractive indices.

Are people being trained in all the skills necessary to describe a new mineral? I think not. It seems to me that here in Canada, more and more new mineral species are being described by fewer and fewer people. In view of the statistics given earlier, I see no reason to suppose that the number of new Canadian species will decline in future years. I do fear that the number of people qualified to describe these species will decline. What can be done about this?

As a first step, I would like to suggest that professors of mineralogy tell their students that the mineral kingdom is not static, but is continually growing. I have been surprised to find that students are amazed when I tell them that probably more than 60 new minerals will be described this year. I think even the most blasé first-year student might be impressed by the fact that more than 25% of all known minerals have been described during that student's lifetime.

Perhaps, also, professors of mineralogy could present certain aspects of mineralogy in more interesting ways. Bored students are frequently the product of boring lectures. Perhaps a revival of interest in minerals — and we should not forget that mineralogy is the study of minerals — could be achieved by requiring students (and professors) to spend some time looking at a few good mineral specimens now and then.

Education of new mineralogists is not enough; we will have to re-educate some of our older mineralogists. This meeting will prove to be of great historical significance to the Mineralogical Association of Canada. I refer specifically to the first MAC Short Course. The course in microbeam techniques so ably organized by Dorian Smith is a definite milestone in Canadian mineralogy. Our executive is considering future short courses. Perhaps one or two of these might deal with some of mineralogy's older techniques before they have been forgotten. One such course might even cover the use of an instrument which is gradually fading from the mineralogical scene — the hand lens.

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