Eur. J. Mineral.
2000, **12**, 5-6

A MESSAGE FROM THE PRESIDENT OF THE
INTERNATIONAL MINERALOGICAL ASSOCIATION

Mineralogy is alive!

This communication has been written on behalf of the council of the International Mineralogical Association (IMA). We are very grateful to the Editorial Committee for providing us with the opportunity to set out our views before the international readership of the European Journal of Mineralogy.

We are at a moment in time when decision-makers in many countries are re-evaluating the support that they give to scientific research. The general public has become increasingly interested with certain aspects of science, such as genetic engineering, computer science and "cyber space", and many of the more traditional disciplines have been taking a back seat in terms of media attention. This carries with it the possibility that, despite the continuing great importance of the research itself, this work may be hindered by a reduction in financial support, as politicians respond to short-term perceptions. The IMA council believes that it is the responsibility of those who represent the different scientific disciplines to speak out and draw attention to important exciting developments in areas other than those currently favoured by the media. If we don't speak out, we can't complain about the results of our silence.

In this respect, our attention has been drawn to the recent remarks of certain European politicians who have indicated that mineralogy is a discipline that has completed, or nearly completed its mandate. Such remarks reveal ignorance of the latest developments in mineralogy, as can be shown through consideration of a few of the most fundamental of these. Firstly the Deep Earth as reviewed recently by Dr Hemley of the Geophysical Laboratory, "Mineralogy at a Crossroads" Science (volume 285, 1026-1027). As the new millenium dawns, mineralogy has gone far beyond the study of naturally occurring inorganic compounds on the earth's surface. Partly this is due to the need to constrain geophysical and geochemical models of the Earth and other planets by studying the properties of materials that lie out of man's reach. Examples include the discovery that hydrogen can be locked up in dense silicates and metals (Bell and Rossman, 1992, J.R. Smyth 1999), and the resulting implications with respect to water resources on planetary bodies. High pressure experiments are also opening up the possible existence of minerals that may exist only in ultra-dense environments within the earth and other bodies of the universe (*e.g.* Brown Dwarfs).

Another example of recent significant advances in mineralogy is the trapping of methane, ethane etc in clathrate hydrates (Hubert King, 1999), their existence along outer continental slopes and in polar regions, and the implications of this with respect to energy resources and sudden climatic changes.

Geochemists know that many of the fundamental discoveries of chemistry in the past have originated from the study of minerals. This is no less true to-day. The development of many new "high tech" materials, ultra-hard materials, materials with unusual electronic properties (*e.g.* high temperature superconductivity in perovskite-based cuprates) and optical properties (*e.g.* opal-like photonic crystals used in controlling the propagation of light, Willem Vos, 1999), have been inspired by an understanding of naturally occurring materials.

The surfaces of minerals, including microbial biofilms that develop on these surfaces, play fundamental roles in many aspects of the geochemical cycle, including purification of groundwater (filtering of potentially harmful microbes, viruses and chemical contaminants) and plant nutrient uptake. With the development of scanning probe microscopes the understanding of processes happening at mineral surfaces, at their interface with the biosphere, atmosphere and oceans is developing at a great pace, and with these instruments we can observe geochemical processes occurring *in situ* at the atomic scale. It is probable that mineral surfaces had a catalytic role in the emergence of life on earth; it is impossible to imagine any scientific problem of greater profundity.

The next ten years will see a vast amount of information returned to us from the probes that will soon be transmitting from Mars. The intelligent digestion of this information will require a knowledge of mineralogy, not just of inorganic mineralogy, but of the mineralogical interface with any possible Martian biosphere, so that we can recognise it if it exists(ed). Other space probes are due to return samples of interstellar dust to earth; only using the most sophisticated mineralogical techniques will it be possible to characterise and therefore understand the origin of these tiny particles.

Geochemists know that the geochemical processes proceed through the medium of minerals. Reactions between minerals are so often the rate-controlling steps of these processes. Without an understanding of mineral reactions, and the crystallographic changes involved in these reactions, there can be no complete understanding of geochemistry. And without mineralogists, there can be no advancements in the understanding of mineral reactions.

Can it be that these European politicians wish to deny citizens in their countries the right to participate in these exciting endeavours, without their being forced to train and work abroad?

A.J. Naldrett
President,
International Mineralogical Association
Written on behalf of and with assistance from the IMA Council
8th December 1999