MEET OUR EXECUTIVE...

A continuing series of short profiles on the IUGS Executive Committee members

Philip H. Abelson of U.S.A.

*Choice words, and measured phrase, above the reach
Of ordinary men...*

(William Wordsworth, Resolution and Independence)

There is a reserved simplicity to the way he talks and the way he writes. It tends, at times, to belie the depth and clarity of his logic and the complexity of the issue at hand. Twenty minutes into an interview with Philip Abelson, Past President of IUGS, and one realizes that it would take considerably more than a half-hour interview and two columns of a quarterly to do justice to this extraordinary man.

A recent press release describes Dr. Abelson as "one of the more vocal voices on matters of energy, environment, national and international policies and political problems in scientific research." Indeed, his editorials in *Science*, America's leading scientific weekly, are respected around the world for their succinct, timely and constructive observations. Editor of *Science* since 1962, Dr. Abelson estimates that he has written well over 300 editorials. "If I stopped editing," he mused in response to a question, "I would write."

The comment is characteristically unpretentious, for Dr. Abelson has authored not only numerous technical papers, lectures and contributions to anthologies, but also the well-known *Energy for Tomorrow* (1975), and has co-authored "Studies in Biosynthesis in *Escherichia coli*" (1955, third printing 1963). Nor has his editing work been limited to *Science*: aside from serving on editorial boards for publications such as *Interciencia*, he was co-editor of the *Journal of Geophysical Research* from 1959 to 1965 and associate editor of the *American Journal of Science* to 1977. In addition, he is co-editor of *Materials: Renewable and Nonrenewable* (1976) and editor of *Researches in Geochemistry* (Vol. 1 - 1959; Vol. 2 - 1967), *Energy: Use, Conservation, and Supply* (1974), and *Food: Politics, Economics, Nutrition and Research* (1975).

The topics are as varied as have been his concurrent professional undertakings. During his long and distinguished career, Dr. Abelson has conducted and directed research in nuclear physics, chemistry, microbiology, organic geochemistry, geophysics, experimental petrology and medicine. "You might say I've been all over the place," he smiled. "I tend to hunt for crises and get into the middle of them. I guess I try to be where the action is."

Initially the "action" was at the Radiation Laboratory of the University of California at Berkeley, where as a graduate student in 1939 he was the first American scientist to identify products of uranium fission. These included three radioactive isotopes of antimony, six of tellurium, and four of iodine. He then worked for the Department of Terrestrial Magnetism at the Carnegie Institution of Washington, a senior independent research institute in the U.S.A. and one

which he would eventually head as President from 1971 to 1978. In 1940, however, his attention focussed on neutron irradiation of thin layers containing uranium and he collaborated in the discovery of element 93 (neptunium).

His war-time service at the Naval Research Laboratory was equally remarkable. In the early 1940's, it was proposed that uranium enriched in U^{235} could be used as a source of power for submarines. The prospects for large-scale isotope separation were bleak. Dr. Abelson, however, was able to devise a method for large-scale synthesis of UF_6 from UF_4 and produce the first 100kg of the substance, by far the largest amount of fractionated uranium available at that time. In 1945, the U.S. Navy awarded Dr. Abelson its highest civilian recognition - the Distinguished Civilian Service Medal.

Returning to the Carnegie Institution of Washington, Dr. Abelson outlined many of the pathways of the biosynthesis of amino acids in microorganisms. When he became Director of the Institution's Geophysical Laboratory in 1953, a post which he held until 1971, he embarked on yet another career as one of America's pioneers in organic geochemistry. He identified, among other discoveries, the original amino acids preserved in fossils, especially in molluscan shells. He found alanine, glutamic acid, glycine, leucine, and valine in many old fossils.

He went on to contribute to studies of the origin of life, advancing evidence to support the hypothesis that the Earth's primitive atmosphere consisted largely of CO , N_2 , and H_2 ; solar irradiation of this mixture produced HCN , which polymerized in the primitive ocean giving rise to amino acids. He further pointed out that the nature of the environment limited the number of compounds available for life.

Dr. Abelson has contributed also to research on the origin of petroleum. "It always seemed natural to me," he explained, "to want to see how a concept in one scientific discipline could be applied to another."

He does not restrict this process of applicability to science alone. Implicit in both his outlook on life and his own life-time work has been the belief that scientists should build bridges between science and society and that this constitutes one of the more significant contributions that a responsible scientist can make.

His views on international scientific cooperation are positive, particularly where programs lead to collaborative interdisciplinary research: "these are constructive causes and should be supported," he said, adding: "The coming together of several unions under large projects such as the International

Geodynamics Program and the International Geological Correlation Programme was due to a realization that the development of new techniques - in geophysics, geochemistry, in deep-sea drilling, remote sensing, paleomagnetism, radioactive dating of the Precambrian - all made it desirable, and necessary, to broaden the earlier focus of geology, to be active in areas where new research was underway."

President of IUGS from 1972 to 1976, Dr. Abelson was also actively involved in IUGG, including a term as Chairman of the U.S. National Committee for IUGG between 1973 and 1976, and as President of the American Geophysical Union, which has a strong international orientation, from 1972 to 1974. He has served on a vast number of committees - for the American Medical Association, the Atomic Energy Commission, the California Institute of Technology, the Massachusetts Institute of Technology, the National Academy of Sciences (he was on the Council from 1969 to 1971), the National Aeronautics and Space Administration, the National Institutes of Health, and many others.

He has just been appointed Chairman of the Geophysical Research Board of the National Research Council, and also Chairman of the Bio-Energy Council, a leading coordinating body for the use of plant material in energy. Asked to describe his formula for avoiding "conflict of interest", Dr. Abelson replied shrewdly, "I have learned when to keep quiet and when to speak".

Predominant in all his comments is the sense of personal satisfaction and fun that he derives from his work. One is hard-put to draw out of him any hint of the prestigious honours that have been bestowed on him, and these include election to the National Academy of Sciences (1959), the Modern Medicine Award (1967), and Kalinga Prize for the Popularization of Science for 1972, the Scientific Achievement Award of the American Medical Association (1974). But mention laboratory work, or the future of alternate energy sources, or writing, or even his favourite

hobby - vegetable gardening - and his eyes light up: "You know, the elements, the process of creativity are the same no matter what you do: you attempt to perceive not only the obvious, but the overtones; you harness as much information together as possible, you think about it, synthesize it, organize it in such a way as to form new insights. The challenge of creativity is very exciting."

One suspects that Philip Abelson's garden is not a Voltairian retreat from the complexities of life. If his concept of creativity is applied to it as it has been to all of his other endeavours, it is probably as fascinating as the man himself.

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