PRESENTATION OF THE ROEBLING MEDAL OF THE MINERALOGICAL SOCIETY OF AMERICA TO MAX H. HEY

CLIFFORD FRONDEL, *Harvard University, Cambridge, Massachusetts.*

Mr. President, members of the Mineralogical Society of America, and guests:

Max Hey is the fourth distinguished British scientist to be given the highest award of our Society, the Roebling Medal. A skilled analyst and outstanding mineral chemist, his interests also have touched on those of his predecessors, W. L. Bragg, C. E. Tilley and, more closely, L. J. Spencer who, like Hey, worked at the British Museum.

Hey's great competence in descriptive mineralogy is exemplified by his work on the zeolites. The first of several extended studies by him of major groups of minerals, these *Studies on the Zeolites*, published as a series of a dozen or so papers mostly between 1932 and 1936, were among the first modern investigations to use an integrated chemical, crystallochemical and structural approach to mineralogical problems. This study followed from the action of L. J. Spencer in setting Hey to catalog the zeolite specimens in the collection as one of his first tasks at the Museum. Hey's later work on the chlorite group, published in 1954, further illustrates his great ability to systematize minerals on crystallochemical grounds. It may be noted in this connection that Hey was first to draw general attention to the usefulness of calculating chemical analyses to a specified total number of anions, such as total oxygen and hydroxyl, as set by structural requirements.

Max Hey was pitchforked, as he says, into the study of meteorites when he was appointed chemist in the Mineral Department of the British Museum following the retirement of G. T. Prior. In this work, involving chemical research together with both curatorial and editorial activities, Hey has maintained at a high level the tradition of work on meteorites carried on at the British Museum by Prior, Fletcher, Story-Maskelyne and others back to the early 1800's. Doubtless his best known contribution to this field is the Hey-Prior *Catalogue of Meteorites*. The first edition, published in 1923, and the first appendix, in 1927, were the work of Prior. Hey prepared the second appendix in 1940, and this was followed by a wholly new edition by him in 1953. A third edition is now in press. Meteoriticists the world over recognize their indebtedness to him for this invaluable work of reference.

Hey's policy as a curator is straightforward: get it; keep it. In his tenure the meteorite collection has gone through a period of expansion exceeding that brought about by Maskelyne in the middle 19th century; and in his care the loss to the collection, caused chiefly by atmospheric

oxidation and loans to other investigators, has been kept to minimal and, in the opinion of some, virtually identical levels.

Another useful book by Hey is his *Index of Mineral Species and Varieties Arranged Chemically*, first published in 1950 with a second edition in 1955. Essentially a combination of a glossary of mineral names and a determinative mineralogy based on qualitative chemical characters, it again illustrates his marked ability to prepare concise, critical and authoritative summaries of mineralogical data.

Following the retirement of L. J. Spencer from the editorship of the *Mineralogical Magazine* in 1955, Hey took over this post and has very efficiently carried the Journal forward. It will not come as a surprise to persons familiar with his power of concentration and facility with editing to learn that a good part of his work is done while traveling between his home and the Museum. The well known *List of New Mineral Names*, published triennially in the *Min Mag* by Spencer over a 60 year period, is now also his work. In the contentious field of mineral nomenclature the meticulous bibliographical and etymological work of this authority has brought much light—sometimes extending in its spectral range into the infra-red—to many problems.

Hey's keen interest in and command over mathematics has found expression in a number of ways. Among them are treatments of various crystallographic problems, the application of regression equations to the correlation of physical properties with chemical composition in multivariate systems, and the calculation of the most probable limits of error of the empirical unit cell contents. In some of these studies he has worked together with his son, an M.D., who also is of mathematical bent. A major and unobtrusive crystallographic contribution was made in connection with the preparation of the *Barker Index of Crystals*. A member of the controlling committee, he helped both in bringing the 7 volumes of this work to press and in carrying part of the load of calculation. The introduction explaining the use of the method, appearing in Part 1 of Volume 1, and the general introduction to the description of triclinic crystals, in Part 1 of Volume 3, are also his work.

In his work and his life, Dr. Hey is a person of uncompromising honesty, plain spoken—with traces of a Lancashire dialect to be sure—reserved and overly modest. And he is a warm hearted person with a twinkle in his eye; an ardent gardener, often appearing with a rose in his buttonhole in season; an opera lover; and active for many years in the Boy Scout movement. In a life of service to mineralogy he has helped shape and lay the foundation stones of chemistry on which our science rests. Mr. President, on behalf of this Society, I am honored to present Max H. Hey for the award of the Roebling Medal.