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Memorial of Helmut G. F. Winkler
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H. G. F. Winkler died suddenly on November 10th, 1980, in Göttingen. Only 17 days before, on October 24th, a symposium had been held in Karlsruhe in his honor at which time he was awarded an honorary doctorate of natural sciences by the School of Biological and Geological Sciences of Karlsruhe University. His friends and colleagues who participated in that meeting had no foreboding that they would have to part with him so soon. As lively and enthusiastic as ever, he followed the lectures and speeches given there to demonstrate the great breadth of his scientific interests and his talent to incite other associates and scholars by his own devotion to scientific research. He will be sorely missed by all who knew him, especially since he leaves a considerable gap in the community of geoscientists.

Helmut Winkler was born on April 3, 1915, in Kiel (Germany), where he also spent his youth. During his last few years in school he acquired an interest in geology and studied problems related to his North German home district, *e. g.*, the sedimentation on the German shores on the North Sea. The first results of these activities were published in 1935/36, not long after he had enrolled at the University of Rostock as a student of Mineralogy, Geology, and Chemistry. For a time he studied in Tübingen and St. Andrews/Scotland. In 1938, after completing a dissertation of thixotropy of mineral powders of microscopic size, he was awarded the doctor's degree 'summa cum laude' under C. W. Correns at Rostock. His participation in the "St. Andrews-University Iceland Expedition" in 1937 had stimulated him to study geomorphic problems and, as a result, he published two articles on the origin of Iceland fjords and the glacial formation of the Glama Plateau in NW Iceland.

In 1938, however, Helmut Winkler's career was interrupted by military service during World War II, and resumed in 1944, at the request of Professor Correns, who had become Director of the Mineralogical Institute of Göttingen University. There he took a position as research assistant. From this time on, Winkler worked mainly on crystallographic problems, especially crystal analyses. His publications on the crystalline structure of eucryptite and homologous compounds were internationally recognized. He endeavoured to determine the quantitative correlation of crystalline structures and their physical properites or, at least, to produce new findings in this respect. This endeavour was documented by his book "Struktur und Eigenschaften der Kristalle" published in 1950, 2nd ed. in 1955.

In 1948 the outstanding quality of his research

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led to an invitation from the University of Leeds/ England, where he then worked as research assistant for 1 year. In 1949 Helmut Winkler was named as Director of the new Crystallographic Institute at Göttingen and, only 2 years later, in 1951 he received three professorship offers from the Universities of Saarbrücken, Marburg, and Technische Hochschule Munich. Winkler decided to go to Marburg, where he was Full Professor and appointed Director of the Mineralogical Institute from 1951 to 1962. During these years he first continued his research in crystallography, but soon extended his activities to the investigation of clay minerals and their properties essential for the industrial production of ceramics. In this field he also achieved valuable results.

About 1955 Helmut Winkler changed the focus of his research entirely. Always aware of future trends in scientific research, he readily devoted his efforts to new problems. After a visit to the USA he had realized that, by means of the new high-pressure apparatus developed there after World War II, it would be possible to investigate rock-forming processes, especially those of metamorphic and some magmatic rocks, in laboratory experiments. Consequently, during his last years in Marburg and later in Göttingen, where he had returned in 1962 as successor to his former teacher C. W. Correns, he directed all his efforts to experimental petrology which kept him captivated until the end of his life.

His first published experiments on the metamorphism of carbonate-free, carbonate-bearing, and NaCl-bearing clay-stones established his reputation as a pioneer in experimental petrology in Europe. He introduced new methods of investigating the chemical and physical conditions responsible for the formation of metamorphic rocks by using, instead of three- or four-component systems, far more complex natural rocks for his experiments. Through the results thus achieved he eliminated many prejudices based on conclusions resulting from experiments with simpler systems. He also showed that some systems were too simplified to explain sufficiently the characteristic processes of metamorphic rock-formation. In Helmut Winkler's own opinion, an important result of his experiments was the evidence that anatectic melts of granitic, granodioritic, and tonalitic composition are formed under the physical conditions of high-grade metamorphism. So his attention was drawn to the family of granitic rocks and, during the last years of his life, many of his studies were concerned with the granitic system Qz–Ab–Or–An–H_2O.

Numerous results of H. Winkler's research were compiled in his book "Petrogenesis of Metamorphic Rocks" which became an international success. Five editions have been printed, first in German, then in English. Translations are also available in Russian, French, Spanish, and Portuguese. The book reveals the high standard of Winkler's research work, as well as his teaching qualities originating from his enthusiastic dedication to mineralogical research and from his talent of presenting complicated theoretical facts in a lucid and instructive manner.

Helmut Winkler's contributions to the Earth Sciences earned him honors of several kinds. He was a fellow of the Mineralogical Society of America, honorary member of the Geological Society of America, full member of the Academy of Sciences in Göttingen, member of the Academy of Sciences in Austria, honorary member of the Geological Society of Belgium and the Geological Society of London, associate member of the Geological Society of France and member of the Geological Society of Finland. In 1977 he was granted the Abraham-Gottlieb-Werner medal by the German Mineralogical Society and the Hans-Stille medal by the German Geological Society.

Throughout his life, Helmut Winkler had devoted all his energies to pushing forward his scientific activities. This restlessness finally had an effect on his health so that he was forced to retire prematurely in 1976. Then, for the first time, although still active as a scientist, he was able to devote more time to his family and his hobbies such as history, the arts, and music.

Helmut Winkler is survived by his wife Ursula, who by her perpetual concern for her husband's work contributed much to the success of his fruitful life, and two daughters and a son and their families. He will remain in their memories and in the memories of all who were associated with him in private and professional life.

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[1]To receive a copy of the complete bibliography, order Document Am-82-190 from the Business Office, Mineralogical Society of America, 2000 Florida Avenue, N. W., Washington, D. C. 20009. Please remit $1.00 in advance for the microfiche.

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