Memorial to Thomas F. W. Barth
1899—1971

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Thomas Fredrik Weiby Barth, professor of mineralogy and director of the Mineralogisk-Geologisk Museum of the University of Oslo, died on the 3d of March 1971, in his 72d year. The Geological Society of America has lost a distinguished Honorary Fellow, and the world has lost an internationally-minded geologist of remarkably broad interests.

Tom Barth, son of a civil engineer, spent his boyhood in a small town in the far northern part of his country. In 1919 he entered the technical college in Trondheim with the intention of becoming a mining engineer, but a summer job at the Kongsberg silver mine after his first year brought him in contact with Carl Bugge, later Director of the Norwegian Geological Survey, who convinced him that his real interest lay in geology. Pursuing this new subject at the University of Oslo he was fortunate in finding teachers who inspired and challenged him, particularly W. C. Brøgger and V. M. Goldschmidt. For a brief period after his first degree he went with his new bride Randi (Thomassen) as scientific assistant to an agricultural college, but he was soon back at the university working with Goldschmidt in his epochal studies of crystal structure and the laws of distribution of the elements. Barth later referred to these early years of intensive concentration on a new and exciting field as the most stimulating period of his scientific life. Although most of the work was in the laboratory, his doctoral dissertation (1927) involved a field investigation of nepheline syenite pegmatites in northern Norway. Thus was established the happy pattern of field and laboratory study that he was to continue throughout his life.

The rich foreign experience that was to be so important to his career began with two happy years as research assistant to Professor K. H. Scheumann in Berlin and Leipzig, and continued with a Rockefeller Fellowship at Harvard in 1929. Here again he was most fortunate in his associates, for he was introduced to American mineralogic and petrologic ideas by such men as Charles Palache, Esper Larsen, and R. A. Daly. His good fortune continued the next year when he was invited to the Geophysical Laboratory in Washington, D.C., and made the acquaintance of A. L. Day, N. L. Bowen, and H. S. Washington. The latter in particular made a deep impression, as revealed by a later remark by Barth: "He taught me not only science and research, but also ethics, wisdom, and natural philosophy."
From this time on for many years Barth was torn between the attractions of well-equipped laboratories in America and his love for his native Norway. In 1936 he returned to Oslo and the next year became professor and director of the Mineralogisk Institutt; in 1939 he spent another year in Washington; then as war threatened to spread to all of Europe he came back to Oslo, landing only a few days before the German invasion. Through the years of the occupation he and his students managed to continue their scientific work under trying conditions, and also to engage in "illegal activities" for which several (Barth included) were confined for a period in a concentration camp.

After the war America beckoned once more, and the Barth family moved to Chicago. But the call of Norway ultimately proved stronger. In 1949 Barth returned again to Oslo, now as director of the Mineralogisk-Geologisk Museum, and from then on his visits abroad were limited to brief sojourns. In Oslo he faced difficult administrative problems, requiring much political effort to obtain the necessary funds for additional personnel and for bringing laboratory equipment up to date. These new activities were not all congenial, but Barth's talent as an administrator is shown by the steadily increasing reputation of the Museum and by the number of students and eminent scholars from many countries who have sought out its laboratories.

Besides the administrative load and besides his always continuing scientific work, Tom Barth somehow found time for energetic participation in international organizations—as president of the Commission on Geochemistry of the International Union of Pure and Applied Chemistry (1957-1960), as president of the Geochemical Society (1960-1961), and as president of the International Union of Geological Sciences (1964-1968). Honors came his way in great number—he was a member of the scientific academies of eleven countries and honorary member of nine professional societies; he received honorary doctoral degrees from the universities of Copenhagen, Nancy, Kiel, Liège, and Zürich; he was given the Reusch Medal of the Norwegian Geological Society, the Roebling Medal of the Mineralogical Society of America, the Eskola Medal of the Geological Society of Finland, and the Boricky Medal of Czechoslovakia. The Norwegian government gave him its highest award for civilian achievement, the Royal Order of St. Olav. He was widely sought, both in his country and abroad, as a lecturer, consultant, instructor for special courses, and leader of field trips. Even in the last months, when a liver ailment was sapping his strength, these activities continued. Almost to the time of his death he was working on plans for a field trip that he had expected to lead the following summer.

Tom Barth's scientific interests were exceptionally broad. X-ray study of crystal structure remained a favorite subject for research long after the initial stimulus of the early years with Goldschmidt. One notable result of this work, regarded by Barth himself as his most significant discovery, is contained in a paper on the distribution of iron and magnesium ions in the spinel structure of magnesioferrite, written with E. W. Posnjak in 1932. The demonstration that the symmetry of this mineral shown by x-rays requires that Mg$^{2+}$ and half the Fe$^{3+}$ ions be statistically distributed over a set of equivalent positions led to the general concept of order-disorder relations in minerals. Among the minerals that attracted Barth's early attention were the feldspars, and the structural relations within this complex group remained a focus of consuming interest.
for more than 40 years. One result of the feldspar study was the suggestion that the
distribution of sodium between plagioclase and potassium feldspar can serve as a mea­s­ure of the temperature of crystallization of plutonic rocks.

A subject of at least equal interest was petrology, particularly the petrogenesis of
granites, basalts, and high-grade metamorphic rocks. The early classical influence of
Brogger was strongly counteracted by the evidence for anatexis that he found in the
Precambrian rocks of southern Norway and by a few weeks excursion in Finland in
the company of J. J. Sederholm, so that Barth early in life became convinced of the
palingenetic origin of much granite. This conviction was not shaken by his association
with Bowen at the Geophysical Laboratory, but perhaps Bowen’s influence can be
traced in Barth’s later thinking about the derivation of different kinds of basalt by
crystal fractionation. Concern with the difficulty of handling complex petrographic
relationships led to suggestions for better ways of presenting rock analyses and for
extending the concept of the norm to metamorphic rocks.

Much of the petrology was based on Barth’s own careful field investigations. In
Norway the field studies ranged over the entire country, although his greatest effort
was concentrated in the extreme southern part near Kristiansand. In later life he
devoted much attention, as had so many of his countrymen, to the always fascinating
rocks of the Oslo graben. During his sojourns in America, field work took him to many
areas, from metamorphic rocks in New York to basalts in the Pribilof Islands. Also
from his temporary base at the Geophysical Laboratory he undertook a field investi­
gation of the volcanoes and hot springs of Iceland, a study which enabled him to
confirm some of the general conclusions reached by Day, Allen, and Merwin from
their pioneering work in Yellowstone Park. Iceland captured his interest not only for
its geology but also for its people and culture, and the work resulted in a small popular
book (in Norwegian), as well as many scientific papers and a lengthy monograph.

Together with the meticulous detail of the laboratory and field studies went broader
speculations about earth history. Goldschmidt had noted the discrepancy between
average amounts of sodium in sedimentary and igneous rocks, and had assumed that
the difference could be explained by an increasing concentration of sodium in sea
water; on this basis he could work out a figure for the total amount of erosion during
gelogic time, a figure that is still widely quoted. Barth took issue with his mentor,
maintaining that the sodium deficiency in sediments could be explained by prior
leaching of sodium salts from the material analyzed and that much so-called igneous
rock has actually had a sedimentary history; hence, sodium in the ocean has probably
reached a steady state, as have other ions, and the total amount of erosion is therefore
much greater than Goldschmidt’s estimate. The materials of the earth’s crust, Barth
insisted, are endlessly recycled from igneous to sedimentary to metamorphic forms
and back again to igneous. This is hardly a startling conclusion in the light of plate
tectonics, but it met with much skepticism when Barth first made the suggestion.

In addition to the more than 200 papers in his bibliography, Barth summed up
much of his thinking in three well-known books. First was *Die Entstehung der Gesteine*

It is easy to recount the events of his busy life, to list honors that came his way, and to review his scientific achievements. Far more difficult is an attempt to picture the man himself—and for Tom Barth this is an all important side of the story. As a teacher he was inspiring, in the best sense of that over used word; as an administrator he was dedicated, patient, willing to listen to all viewpoints but tenacious in promoting the welfare of his institution; in the field he was the most genial of companions, able to shed briefly the worries of his official positions for the sheer joy of tramping through wild country. Fiercely loyal to his native Norway but at home in all countries, he gained wisdom from the extensive travel that served him well when he was called upon to lead international organizations beset by parochial national concerns. With all his honors and responsibilities he remained modest and unassuming almost to a fault, careless of personal comfort in a degree sometimes embarrassing to his companions. It was impossible for him to hold a grudge for long toward those who had injured him, even toward the Germans who had despoiled his country or toward Goldschmidt with whom in later years he had a serious falling out. Somewhere in his make-up was the impulse of an artist, evident in the sketches with which he decorated some of his papers and in the grace with which he traversed winter slopes on his beloved skis. When all this is said, something still is missing, just his simple friendliness, which has touched all who had the good fortune to visit Tom and Randi at their home, either their beautiful house in the hills above Oslo or one of their temporary residences in America.

He was a man great of heart and soul, a true world citizen of geology. He will be sorely missed in professional circles and even more in the minds of those who knew him well.

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