



Heinrich Neumann

16 July 1914 – 24 October 1983

In Memoriam

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Henrich Neumann, a central figure in Norwegian mineralogical teaching and research, died in 1983, two years after retiring from his position as Professor of Crystallography, Mineralogy and Petrography at the University of Oslo.

A man of less than average height, conservative of nature, extremely correct, at times elegant in appearance and deportment, Neumann treated all who came in contact with him, professionally and socially, with equal courtesy.

A master of his chosen form of Norwegian, he charmed and regaled friends, colleagues and stu-

dents alike with his reminiscences of geology and geologists. His oral abilities were reflected in his lectures at Oslo which were examples of clearness and elegance both as regards content and delivery.

Neumann spent most of his working years in Oslo, where he left his mark not only as geologist and mineralogist, but as a university administrator and as an office-holder in the Norwegian Academy of Science.

Although he had been in poor health for some time, his untimely death in 1983 came as a shock

to his many friends and colleagues in Norwegian and international geology. With his death our science has lost a respected and recognised research worker, teacher and colleague, and a lively and stimulating leader.

Norwegian geoscience is decidedly the poorer with his passing.

Early years and education

Henrich Neumann was born on 16 July 1914 in Sjøk in central Norway and grew up in Toten in the vicinity of Lake Mjøsa, where his father held the office of rural dean.

Influences from the cultural environment of his home during these early years were to remain with Neumann throughout his life. The nature of his studies at High School (Stabekk gymnas, Bærum, near Oslo) indicates that he originally intended to pursue classical studies.

However at the University of Oslo he came under the influence of teachers in quite other lines of study, in natural sciences. Starting with chemistry and gradually moving over to geology, Neumann was inspired by such masters as V. M. Goldschmidt and Tom. F. W. Barth. His final degree (magister) thesis dealt with mineralogical studies of the native silver-bearing calcite veins in the Kongsberg area west of Oslo.

Norges geologiske undersøkelse 1939–1947

On graduation from Oslo, Neumann entered the Geological Survey of Norway (NGU), then situated in the capital city. One of his early assignments was geological mapping of the bedrock geology of parts of the northern area of the Oslo Permian Paleorift (Hurdal), an area notorious at that time for poor quality topographical maps, thick and often continuous overburden, dense vegetation and an extremely complex geology. He is reported to have said that he 'wept real tears' in his early work. Those of us who have taken part in the more recent years' investigations of that part of Norway, when at least the maps and logistic support were infinitely better, can appreciate the difficulties of this early work.

However it was Neumann's continued studies of the native silver-bearing veins of the Kongsberg area that were to mark this first period of his career and link his name with that of this historically very important mining district.

He was perhaps the last of the very few professional Norwegian geologists/mineralogists who

were able to study these fascinating deposits at a period when the mines were still, more or less, accessible. In 1944 he published a detailed description of the mineral parageneses of the Kongsberg veins and an evaluation of their depositional conditions. The work still remains one of our main authoritative sources of information on these, now inaccessible, deposits. In 1945 Neumann was awarded the degree of Dr. Philos. of the University of Oslo for his paragenetical studies at Kongsberg.

In the course of these investigations, Neumann was able to identify and describe a new mineral, a water-bearing barium-calcium aluminosilicate, to which he gave the name armenite after the Armen Mine, from where the specimen containing the new mineral came. Armenite was to prove to be only the first of several new minerals to which Neumann and his various collaborators were later able to give names having Norwegian associations.

Neumann's years at the Geological Survey saw him also engaged in geological and mineralogical investigations further to the west in the southern Norwegian Precambrian Shield in the county of Telemark. This work began in 1941 with quadrangle mapping on map sheet Kviteeid, a sheet which was finally completed and published with Johannes Dons as co-author in 1961. Perhaps stimulated by his ongoing work on the Kongsberg silver veins, Neumann's interests quickly turned from regional mapping to the numerous deposits of copper, molybdenum, arsenic, gold, silver, lead and zinc which characterise these parts of the Baltic Shield. Among the publications resulting from Neumann's years in Telemark, the most significant and most frequently cited is probably the study of the native silver/copper deposits in sandstones interlayered with basalts at the Dalane locality in the centre of the area. However, he drew upon material from this period in later years for several other mineral paragenetic studies.

Neumann's years at NGU were not devoted solely to his geological work in the Kongsberg and Telemark areas. The larger part of the period was marked by the tragic years of the war and the military occupation of Norway. Although he only occasionally and reluctantly could be persuaded to mention his non-scientific activities at this time, it is clear that Henrich Neumann played a not unimportant role in the Norwegian resistance, occupying positions of considerable responsibility and trust in the underground or-

ganisations of areas in which his geological studies provided a plausible excuse for moving about and meeting people. He was obliged to leave Norway in 1943 and take temporary refuge in Sweden, but was back in action again in the Kongsvinger area in the closing year of the war.

Leeds University 1947–1950

In 1947 Neumann joined the staff of Leeds University, as lecturer in geochemistry and mineralogy. He was not alone in making this journey. The late 1940's saw quite a minor influx of Nordic geoscientists to Leeds. Others who made their home and place of work there for shorter or longer periods were Lars Lund, silicate analyst from Norway, and Oleg von Knorring, mineralogist from Finland.

At Leeds Neumann was responsible for teaching courses in mineralogy and geochemistry which he did with considerable success. Although not directly responsible for the teaching of economic geology per se, he nevertheless allowed his experience gained at Kongsberg and in Telemark to flavour his teaching and to influence the directions taken later by several of his students, including the present writer and his fellow student, W. G. Jeffery, now Director of The Canadian Centre for Mineral and Energy Technology (CANMET) in Ottawa.

As geologically interested mining students we perhaps responded more than willingly to Henrich's 'sales talk' on behalf of ore geology and ore mineralogy and were persuaded to stay on after graduation to undertake a study of tin mineralisation in Cornwall leading to the degree of M. Sc. in geology. That one of us subsequently came to practice his ore geology in Norway must also be ascribed to Henrich Neumann's influence, initially at least.

Another Leeds geology student at that time, Peter Padget, divisional director at NGU since 1971, also formed part of this minor return influx from Leeds to Scandinavia.

Neumann's influence on the academic and student community at Leeds in the late 1940's was not confined to his teaching and research in the Department of Geology. As subwarden of Lyddon Hall, one of the student halls of residence connected to the university, his cultivated and cosmopolitan manners and his ability to establish relaxed relations with younger persons, contributed in no small manner to the 'rounding-off' of 3–4 generations of Lyddon students.

Some of Neumann's most significant and most-cited publications stem from his Leeds period. In works such as 'On hydrothermal differentiation' (1948) and 'Notes on the mineralogy and geochemistry of zinc' (1949) he showed an originality of thinking and a thorough grasp of the subject which can only make one wonder what he might have achieved if this period had continued longer.

However, the call of his native land was too strong. He once remarked to the present writer that he wouldn't have worried if he had had to remain in England, if he could have forgotten how the birches in Norway looked when they first began to green in spring.

Mineralogical-Geological Museum, University of Oslo 1950–1983

Neumann returned to his birches, to take up the position of Head-Curator (førstekonservator) at the Mineralogical-Geological Museum of the University of Oslo, which was to be his place of work for the rest of his life. This was, and still in many ways is, a hallowed place among Norwegian geoscience institutions. Built in the years 1911–1916 through the efforts of W. C. Brøgger, it had been the place of work of V. M. Goldschmidt in some of his most productive years. The post-war period was to be dominated by another of Neumann's teachers, Tom. F. W. Barth, until his death in 1971.

As Head-Curator at the museum, Henrich Neumann initiated and carried through, with the help of colleagues and students, a number of projects of prime importance for Norwegian mineralogy in general and for the effectiveness and reputation of the Museum in particular.

Of the internal tasks he set himself may be mentioned two that he considered especially vital. The first was the resumption and expansion of contacts on a world-wide basis for the exchange of mineral specimens as a means of enlarging and modernising the museum's collections.

The second task was the rebuilding and development of the museum's facilities and equipment for the identification and chemical analysis of minerals. Foremost among this work was the establishment of an X-ray diffraction laboratory for the determination of crystal structures. Lack of funding and tightness of supplies in the immediate post-war years led to improvisations; use was made of second-hand hospital equipment,

while self-centring cameras were developed and produced in the museum's own workshops. These same cameras are still in use today after making approximately 27,000 determinations.

In connection with the work of the X-ray diffraction laboratory, Neumann, together with a number of his students, prepared and issued a series of publications, giving in tabular and diagrammatic form the powder patterns of most of the main groups of minerals. In addition to this valuable work, the results of the investigations of a large number of minerals and mineral deposits were reported in the literature.

In between this more specifically mineralogical work, Neumann still found time to contribute to our knowledge of ore deposits and ore geology generally and was for a time in the early 1950's active as advisor to NGU in their 'North Norway' project devoted to the identification of mineral resources in that part of the country.

Neumann's interest and activities in the investigation of minerals led him towards the end of the 1950's to initiate a publication series in *Norsk Geologisk Tidsskrift* which would hopefully bring together future information on the country's minerals and mineral deposits. The series 'Contributions to the Mineralogy of Norway' began in 1959, and to the present more than 70 individual studies have been issued. Neumann, as sole or joint author, has been personally responsible for eight of the publications. However, his mineralogical research publications have been by no means confined to the series which he initiated. In later years, for example, he and his coworkers reported on two more new minerals in the international press. The first of these (1968) tombarthite, an hydroxysilicate of REE, from pegmatites in the Iveland-Evje area, was named for his former teacher, colleague and friend, Tom. F. W. Barth, while a new calcium-yttrium-fluoride, tveitite, was named after the person who found the mineral in an amazonite quarry in the Tørdal area of Telemark.

In 1953/54 Neumann took time off from his duties and engagements at Oslo and spent a year at the University of Indiana as visiting professor.

A product of this period was a paper together with American colleagues on trace-element variation during fractional crystallisation, which may be seen as evidence of Neumann's continuing interest in the problems of hydrothermal and magmatic processes which had occupied him in his earlier years.

On his return to Norway from Indiana, Neumann resumed his mineralogical activities at the Museum, but a project of a more directly potentially economic nature was to engage more and more of his time and energy. His interest in the mineral nepheline as a possible raw material for use in the ceramic and glass industries probably can be traced back to his student days, but in the 1950's he was to develop this interest from an idea to a viable project which in time led to the establishment of the present highly successful production of nepheline syenite on the island of Stjernøy in Finnmark.

Neumann's insight into the economic possibilities of minerals also led to other forms of applied mineralogical activity. He was one of the pioneers in what has now become a nation-wide occupation or even 'cottage-industry', viz., the working and preparation of domestic minerals as components in hand-made jewellery. Some of the stones were sent to Germany for polishing in 'cabochon' form, while others were beneficiated by means of locally constructed tumblers. Neumann made use of several of the pegmatite minerals from the southern Precambrian area of Telemark that he knew so well, including amazonite, and 'sun stone' (aventurine feldspar). These minerals became very popular in the mid-1960's, probably not the least since they were sold tastefully mounted and for a reasonable price! These early efforts to produce quality jewellery from Norwegian minerals by Norwegian craftsmen can be said to have laid the foundation for a very attractive and highly reputed branch of Norwegian handicrafts, combining traditional silver work with the products of local mineral deposits.

In 1966 Neumann was appointed to the Chair of Crystallography, Mineralogy and Petrography at the University of Oslo, though he continued to make his place of work the Museum. In the years that followed he was to devote more and more of his time to university affairs and to administration and to find fewer opportunities to continue original work on mineralogy. His publication list shows very few titles after the middle of the 60's.

His period as Dean of the Mathematical-Natural Science Faculty at Oslo from 1971-1974 coincided with a period of considerable activity in university politics, and Neumann was in the forefront of the almost radical new-thinking which was necessary to solve the tasks in hand.

He did not, however, let university politics take complete overhand. For many years he had

maintained a voluminous card-index with information on every mineral reported from Norway. On his retirement in 1981 he set himself the task of converting this index to a publication, which would be an authoritative text on the mineralogy of Norway. This task he more or less completed before his death in 1983. A document recording the occurrence of something like 850 mineral names was the result. The final editing of the manuscript has just been completed at the time of writing, and we can look forward to this monumental work, so dear to Heinrich Neumann's heart, soon being available for all to delve into. It is a veritable 'mine of information' and hopefully will inspire others to take up their own investigations of Norway's minerals and mineral deposits. In this way it will be a fitting memorial to one who did so much in his time for this aspect of Norwegian geoscience.

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