THURE GEORG SAHAMA IN MEMORIAM

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Th. G. Sahama died on 8th March, 1983 after a short but fatal illness. Together with J. J. Sederholm and Pentti Eskola, Sahama was one of the most outstanding and internationally best known Finnish geologists. His death was a blow to his friends and a great loss to Earth Sciences in Finland.

Thure Georg Sahama was born in Viipuri (Vyborg) in 1910, where his father was treasurer of the city office. Within a few years his family moved to Helsinki, where Thure started school and subsequently passed the matriculation examination in 1929.

Already as a young boy, Thure Sahama

(Sahlstein until 1936) was an eager and frequent visitor to the collections of the Geological Institution of Helsinki University. A few years later he worked there as a teaching assistant and had already published several scientific papers before graduating in 1934. Two of these he wrote while still a schoolboy. In his own words, his interest in rocks and minerals was aroused in his grandparents' home by beautiful crystal specimens which he was not allowed to touch. So, it had to be geology and mineralogy when he started his studies at university.

Some years before graduation Sahama visited Bruno Sander in Innsbruck. Sander inspired him to choose petrofabrics as the subject of his doctoral dissertation. Published in 1936, this study was immediately acknowledged internationally and is still quoted as an early example of the application of petrofabrics to the Precambrian basement area.

In 1935 Sahama made a second trip to meet Sander and on his way to Austria he also visited Göttingen, where he met V. M. Goldschmidt, »the father of modern geochemistry». Influenced by this meeting, Sahama started to build a geochemical laboratory at the Geological Institution in Helsinki the very next year. He had lost all his interest in petrofabrics and switched to geochemistry. His first geochemical paper, on the accessory elements in Finnish granulites, came out in the same year (1936) as his dissertation on the petrofabrics of these very same granulites. Two years later he was appointed docent and started to lecture on geochemistry. Very few lectures were possible, however, during the war years of 1939—1944. With the coming of peace, he published in 1945 a textbook, »Geokemia», first in Finnish and some years later together with Kalervo Rankama in English. This book, entitled »Geochemistry» was translated into many languages and was without doubt one of the main reasons for the worldwide enthusiasm for geochemical research in the 1950s.

Sahama's own interest, however, had already shifted from geochemistry to the thermochemical study of minerals. With this in mind he had gone to visit the Geophysical Laboratory of the Carnegie Institution of Washington. His intention was to determine the thermodynamical data and the stability of minerals and rocks by solution calorimetry. These efforts were successful and the reliable results he obtained for olivine and orthopyroxenes kindled new faith in the calorimetric method for solving petrological problems. Once again worldwide acclaim greeted Sahama, and hydrofluoric acid calorimeters were soon being constructed in petrological institutions the world over.

After returning home, Sahama built thermochemical facilities in Helsinki. The laboratory was used to determe thermochemical data for the humite group and the stability relations of some calcium-magnesiumsilicates. It was not long, however, before it became clear that the expections vested in the method were not being totally fulfilled with the type of instrumentation available.

A trip to Edinburgh in 1951 to meet Professor Arthur Holmes had important consequences for Sahama's later life and scientific career. Holmes gave him a piece of nepheline-bearing lava from Mt. Nyiragongo, a volcano in North Kivu (Belgian Congo/Zaire). The nepheline was extracted out of the specimen and chemically analysed by Birger Wiik. The nepheline turned out to contain more potassium than sodium in weight percent. This was a considerable surprise since such a ratio of potassium to sodium was not thought to be possible in natural nepheline.

An expedition therefore was set out to collect more material from the areas of young alkaline volcanism in East Africa and around North Kivu. By lucky chance, the large number of specimens brought back to Helsinki included some collected on the Goma-Rutchuru road on the outer slope of Mt. Nyiragongo. These lava samples contained large crystals that were first taken to be nepheline. Closer examination, however, indicated that they were kalsilite

($KAlSiO_4$), a very rare species previously known only as small microscopic grains from two localities (in Uganda and Italy). Kalsilite appears in rock in a perthite like exsolution texture together with nepheline. The occurrence in the Nyiragongo lava indicated an exceptionally high crystallization temperature and very rapid cooling of the magma and was in good agreement with known data on the stability of the synthetic $NaAlSiO_4$—$KAlSiO_4$ system.

It was clear that the Nyiragongo lavas exhibited unusual features warranting further study. This gave Sahama reason to visit this volcanic area in Africa several times during the following years. Apart from the pure volcanological aspect, the study of the lavas of the Nyiragongo, Nyamuragira and Baruta volcanoes also offered him a new area and a new series of rocks to work with. The research he conducted in the region has greatly furthered our knowledge of the structure and creation of the Earth's crust.

His successful investigation of these strange rocks made Sahama in a few years into a well-known authority in volcanology. As a consequence he was asked to serve a term as a vice-president of the International Volcanological Institute in Catania.

Many extraordinary minerals specific to Nyiragongo, some of them entirely new species, were detected and studied by Sahama and his co-workers in the laboratory using various modern techniques. Inspired by the beauty of the well-formed crystals found in these rocks he turned his interest more and more towards pure mineralogy. The subjects of his work were not only the minerals in volcanic rocks but also a large variety of minerals from many different rock types, a number of which were well-formed representatives of gem-quality crystals. These induced him to compile a large collection of fine mineral specimens including many valuable rarities. This collection certainly gave Sahama full compensation for his frustrated desire for beautiful crystals in his grandparents' home. He frequently added to this collection with new samples acquired during his many later trips to Africa and elsewhere after the volcanoes in Zaire became inaccessible in 1959.

Thure Sahama published well over one hundred scientific papers, most of them in international series. The clarity of his thoughts and his well-kept notes made writing easy for him. He was also known as a good academic teacher and lecturer. He was at his best, however, when guiding and conducting young graduates at the beginning of their research work. He demanded much but was also ready and able to give in turn. Even though he was above all a scientist who devoted his whole life to science and research, Thure Sahama was a warm personality who won many friends both at home and abroad. Good food, crayfish and Havana cigars were three weaknesses that were pampered to, if at all possible, wherever he went.

The Finnish Geological Society elected Sahama an honorary member in 1970 and presented him with the highest existing award, the Golden Eskola Medal, in 1980. He was a honorary fellow of the Mineralogical Society of America and a corresponding member of the Geological Society of Edinburgh and of the Acad. Royale des Sciences d'Outre-Mer (Brussels). He was also an honorary member of the Mineralogical Society of Great Britain and Ireland as well as of the Mineralogical Society of the U.S.S.R. Sahama received the title of Doctor of Philosophy, honoris causa, in Brussels and was a foreign member of the Norwegian Academy of Science. In 1972 he was awarded the tittle of Academician by the President of the Republic of Finland.

Thure Sahama never married. His mineral collection, his library and his many private instruments in his laboratory were donated to the University of Helsinki.

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