

ONE OF SWEDENBORG'S MICROSCOPES?

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Recently Dr. Torsten Althin brought to my attention a paper in Swedish, written by himself in collaboration with civil engineer George Spaak of Bergvik, Sweden, with the title, "A Single Microscope That Possibly Belonged to Emanuel Swedenborg." The paper was published in *The Technical Museum's Yearbook Daedalus 1950*, Stockholm. Dr. Althin, formerly the head of the Technical Museum of Stockholm, is now working at the Cranbrook Institute of Science, Bloomfield Hills, Michigan. The following is a digest of the main points of the article.

In the 1930's Mr. George Spaak bought from the estate of a deceased manager of Axmar Furnace in Sweden a simple instrument which to him at first looked like a common magnifying glass. Later he became aware that the instrument really was a single (simple) microscope of Leeuwenhoek type and presumably of historical value. In 1949 Spaak donated the microscope to the Technical Museum in Stockholm, in which connection a considerable amount of research was done in trying to determine the identity and history of the instrument.

The microscope in question, which we shall call the Axmar microscope from the place of its discovery, is designed to be held in hand with the lens close to the eye. The brass handle is 101 mm. long with two brass rings, 20 mm. in diameter, fixed at the top. Between the rings, which are cemented together, is mounted a lens, 9 mm. in diameter.

The side of the lens holder closest to the eye is painted black, the paint partly covering the lens. From the lower part of the handle extends a flexible specimen holder, ending in a sharp point in front of the lens. By a winged nut the specimen holder can be brought closer to or farther away from the lens and thereby the specimen can be brought into focus. That part of the lens holder which is towards the specimen is a concave mirror of polished brass, which concentrates light on the specimen. The lens magnifies 42 times, and the instrument as a whole is described by experts as very well made and of good optical qualities. It was kept in a wooden case, made in a surprisingly crude manner compared with the excellent craftsmanship of the microscope itself.

The Axmar microscope was probably made in the first decades of the 18th century, thus at a time when Antony van Leeuwenhoek (1632-1723) had brought the single microscope to a high perfection by his secret method of grinding lenses. Leeuwenhoek made a considerable number of microscopes of this type, some of which are still extant. The Axmar microscope is the first of the Leeuwenhoek type to be found in Sweden. It is, however, very unlikely that it was made by Leeuwenhoek himself. An extensive search in European museums has failed to turn up a similar microscope. This may indicate that only one of its kind was made.

When the nature of the instrument was ascertained, the question arose, Who has been the owner of it and how has it come into the estate of the manager? The nature of the instrument makes it very unlikely that it originally was acquired by a layman. Tradition gave the first impulse to a research into the history of the instrument. According to that tradition, still living among the people at Axmar, Emanuel Swedenborg lived there. This tradition has foundation in fact, for Swedenborg did live at Axmar on several occasions in the beginning of the 18th century.

The Axmar Furnace, situated about 20 miles north of the city of Gävle in northern Sweden, is now closed down. It has, however, a history going back several centuries. In 1672 it was bought by Assessor Albrecht Behm, the father of Sarah Behm, Swedenborg's mother. After the death of Assessor Behm, the furnace was for many years effectively, though arbitrarily, managed by a sister of Swedenborg's mother, Brita Behm-Schwede, on behalf of the heirs. After the death of his mother, Swedenborg and his brothers and sisters became part-owners in the Furnace. In the 1720's Swedenborg alone emerges as owner of one-fifth of Axmar while his aunt Brita Behm controls the other four-fifths.

In May, 1721, Axmar's Furnace was burned down by Russian marauders. In the following years the furnace was rebuilt. During this time Swedenborg often stayed long periods of time at Axmar, attending to the construction work. It is likely that he later visited Axmar on some occasions owing to the increasing difficulties of maintaining his rights in the use of the property against his aunt's policy of obstruction. Tired of all the troubles, Swedenborg ultimately sold his part to his aunt.

Swedenborg was a hard-working man, always economical with his time. It is therefore likely that at his visits to Axmar he also

found time to pursue his studies, which at this time particularly dealt with mineralogy and chemistry. During his first journey abroad Swedenborg was impressed by the new possibilities in research opened up by the microscope. He is known to have owned microscopes, and it is probable that he had use of a handy instrument like that found at Axmar during his stays there.

Since only one microscope of this kind has turned up, the authors think it possible that Swedenborg, if he was the original owner, might have had it made by some craftsman, possibly in England during his first stay there, or might even have made it himself. We know that Swedenborg during his first journey abroad stayed with instrument makers and among others and "stole their art." In Leiden he lodged with a lens grinder and learned his trade. He even bought himself a set of tools for lens grinding. At Swedenborg's time it was still rather common that scientists made their instruments themselves, and Swedenborg himself writes in a letter of 1711: "In addition, I have learned from my landlord to make brass instruments so that I have made a large number for my own needs." The microscope could thus have been made by Swedenborg at this time.

It is probable that Swedenborg during his last stay at Axmar was not aware that at a later date he would sell his part of the furnace in order to avoid further trouble with his aunt Brita. Under such circumstances it is likely that some of his belongings were left behind.

It might be asked how the microscope could be kept in the building with so many changes of managers that must have taken place during two centuries. This can be explained by a custom of old that the incoming manager often bought a considerable part of the outgoing manager's household belongings including "rubbish" in attics and drawers. The microscope in its very crude case probably did not attract much attention or was regarded of little use.

The evidences brought forth by the authors are circumstantial, but further research might reveal that the Axmar microscope once really belonged to Emanuel Swedenborg. In any case the discovery of the instrument gives a new and important link in the technical development of the microscope.