

Obituary: Henry Freij, a devoted archaeologist

by Birgit Arrhenius

In the autumn 1998 our long time collaborator in the Archaeological Research Laboratory ingenieur Henry Freij passed away after a long period of illness.

Henry Freij started his career as an engineer at SAS. Going by car every day out to Arlanda he became interested in the many ancient monuments along the road and began to study archaeology in his spare time. He worked seriously on the problem of finding the course of the direct waterway which is thought to have linked Uppsala and the Baltic in Early Medieval times. In order to study the Långhundraroute, as this waterway is known among the archaeologists, Freij measured the height of the passages of the many small rivulets in the area of which many were dried out. It was in connection with this work I got to know Henry Freij, as he became interested in carrying out phosphate analyses for his studies. Later he pursued this interest further, in studying how different properties of the soil were changed in connection with human habitation. These studies he performed in our laboratory, but having his daily work at Arlanda he did this work in the late evenings and early mornings. He specialised on the magnetic properties of soil samples, susceptibility, and in connection with this constructed his own instrument for measuring this property. The sus-

ceptibility is a property which is influenced by human habitation, as the susceptibility of the soil is increased by the extremities of heat by building fires. This phenomena is due to the transformation of hematite, Fe_2O_3 to magnetite Fe_3O_4 . His collection of samples consisted of natural soils, samples from modern fires and from ancient,

(archaeological) fireplaces. From the natural samples he made a series of tests burning the samples at different temperatures to show at which temperatures the transformation of hematite to magnetite was most effective. He also compared the results of his studies of susceptibility with studies of phosphate content and the colour of the soil, concluding that susceptibility provided the best method for tracing ancient fires. His results, which were presented in a seminar paper in 1980 "Förändring av markmaterial genom mänsklig påverkan speciellt dess magnetiska egenskaper", showed that whereas there is a clear relation between susceptibility and phosphate content in modern samples, this relation is not generally perceptible

in the archaeological samples. He explained this by arguing that in archaeological samples the phosphate content was affected not only from phosphate fixation through temperature changes caused by fire but also had other reasons. A rise in susceptibility, on



Henry Freij, at work on the "Gullhögen" mound, Husby Långhundra 1988. Photo: Anita Malmius.

the other hand, gave a more clear indication of the presence of a fire. Similarly Freij showed that a blackening in soil colour was not necessarily an indication of charcoal content but could also be an indication of other highly decomposed organic material. He concluded that studying changes in susceptibility provided a reliable means for studying settlement structures that should preferably be added to the more established measures as soil colour and phosphate content analysis.

This treatise won general appreciation and in the forthcoming years Freij was offered many interesting opportunities to practise his experiences. One of the most prestigious projects was his survey of the chieftains site at Borg in Lofoten (cf. Frej and Arrhenius forthcoming) made in the late eighties. On this site he made a detailed contour map as well as a protonmagnetometre survey covering the whole site together with a detailed mapping of the phosphate and susceptibility properties of the floor layers in the main hall. It appeared that in the hall he could distinguish between different rooms and activities; these conclusions related convincingly to the room-division implied by building constructions found by the excavators.

At this stage of his career Freij had taken an early pension from SAS to be able to devote all his time to archaeology. He was accepted as a graduate student at the Archaeological Research Laboratory and got a permanent working place in the laboratory. We all enjoyed to having him there and getting his comments on all kinds of seminar papers. We also benefitted from his practical abilities. The improvement he made to our instruments and his genius for inventing experimental apparatus for special, sometimes obscure purposes.

One of this devices was a prototype to a laser scanning instrument which he wanted to use to find traces of the individual carver's hand in rock-carvings and runic stones. The results provided by this prototype were so promising that we applied for a grant from the Knut and Alice Wallenberg Foundation to build a complete scanner; this still is in use. Freij devoted his last years to

working with the statistical evaluation of the measurements he collected from the scanner. He found a skilled pupil in this field in Laila Kitzler, who now, as a graduate student is taking over his fruitful work.

It is not possible in this memoir to describe all Freij's technical devices and ideas. Let me only as an example of his wide knowledge quote his work on the so called Balkåkra drum, an item with a large slightly convex bronze disc dated to around the 16th century BC. He proposed the object was never a drum at all; rather assuming it to have originally been highly polished, it could have served as a burning glass used in the cult of the sun. This hypothesis is still valid as no one really has found out any better explanation of the function.

The contributions to laboratory archaeology made by Henry Freij will last, and those of us who knew him will never forget his engaging and vivid personality.

Bibliography of the papers dealing with archaeology published by Henry Freij

- Freij, H., 1977. "Balkåkratrumman" i solkultens tjänst? *Fornvännen* 72.
- Freij, H., 1980. *Förändring av markmaterial genom mänsklig påverkan, speciellt dess magnetiska egenskaper*. Seminar paper. The Archaeological Research Laboratory, Stockholm University. Stockholm.
- Freij, H., 1986. Viking ristade och Grimulv. Studier av runstenarnas spårprofiler och huggmärken. *Laborativ arkeologi* 1. Stockholm.
- Freij H., 1987. Statistisk värdering av skärvstenshögnas gruppering, baserad på termoluminiscensdateringar. In: Wigren S. Sörmländsk bronsåldersbygd. *Theses and papers in North-European Archaeology* 16.
- Freij H. 1990, Dokumentation och analys av arkeologiska ytstrukturer. *Laborativ arkeologi* 4. Stockholm
- Freij H., 1992. (B. Arrhenius and Henry Freij), "Pressbleck" fragments from the East Mound in Old Uppsala analysed with a Laser Scanner. *Laborativ Arkeologi* 6. Stockholm
- Freij H., 1993. Rock Carvings, a Virtually Unlimited Source of Data for Statistical Analysis. *Pact* 38. Risensart, Belgium.