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A long-lasting and unforgettable scientific achievements and personality: Göran Possnert 1951-2022

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Göran Possnert was a remarkable, innovative and sympathetic scientist who was always open to new challenges and endeavors. His sense of humor let him engage easily with everyone and he was an inspiration to young colleagues, many of whom would go on to flourish in the research areas that he pioneered. Göran passed away on October 10, 2022 leaving behind enormous national and international research materials on human culture, environment and climate. His contributions to the development and advance of accelerator mass spectrometry, among other scientific interests, were vital to the progress of this scientific field. He opened the field of AMS radiocarbon analysis and other cosmogenic isotopes for a wide range of applications. Göran's contributions to radiocarbon research were through technological tools and applications. The development of technological tools includes setting up and technical expansion of 3 AMS systems, the 7 MV EN tandem accelerator, the 5 MV Pelletron tandem accelerator and the Green-MICADAS low energy accelerator as well as the testing of Intracavity OptoGalvanic Spectroscopy for measurements of C-14. In sample preparation technology, he developed methodology for materials that hold a minute amount of carbon, such as iron artifacts, separation of alkaloid for radiocarbon dating and ultra-small sample preparation method down to a few µg C samples for analysis of DNA and other biomedical targets. He participated in several international radiocarbon laboratory intercomparisons and laboratory comparisons for other cosmogenic isotopes. On the application side of radiocarbon, he contributed to a wide range of research extending from life science to biomedical applications, including understanding tumor growth dynamics, postnatal neurogenesis in the human amygdala with cell turnover rates comparable to the hippocampus, the dynamics of cell generation and turnover in the human heart, the lifespan and turnover of microglia in the human brain and how diploid hepatocytes drive physiological liver renewal in adult humans. Göran made many contributions to the radiocarbon-archeological research such as a full list of radiocarbon dates for woolly mammoth and other species of the mammoth fauna available from Wrangel Island, northeast Siberia, Russia, and the dating of many Viking and museums artifacts. In the natural environment, he provided radiocarbon time scale and the dating of many sediments, plant remains, tree rings, carbon-bearing minerals and materials for the revision and calibration of the last 40 kyr for climatic, historical and environmental analyses. Among such archives, the Vedde Ash Bed (mid-Younger Dryas) and the Saksunarvatn Ash (early Holocene), which are important regional stratigraphic event markers in the North Atlantic, the Norwegian Sea, and the adjacent land area and he contributed to The Circum-Arctic Sediment CARbon DatabasE (CASCADE). The contributions of Göran in the development of sample preparation and AMS systems for the measurements of Be-10, I-129 and Cl-36 include: setting up AMS beamlines and needed accessories to perform the measurements, establishing internal standards and background materials for the analytical control and setting up chemical separation labs dealing with all types of solid, liquid and gas targets. The applications in the field of cosmogenic isotopes, other than C-14, were enormous and covered many parts of the world, environmental settings and materials. Examples include analysis of Be-10 and I-129 in ice, precipitation, marine and fresh water, aerosols, sediments, rocks, tree rings and organic materials. The applications comprise finding evidence for solar storms in the

past and their effects on space weather, reconstruction of the geomagnetic dipole moment variations for the last glacial period, investigating the Late Holocene pathway of Asian Summer Monsoons, and tracing marine water circulation in different parts of the world and environments. These contributions aimed to document processes occurring in the Earth's surface environment and atmosphere and utilize these archives for a better understanding of changes in our environment and climate in the past, present and future.

Student Submission

No

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