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The three Swedish kings of geodesy – Speech at the NKG General Assembly dinner in 2022

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Abstract: During the 1950s–1970s, there were three geodesy professors in Sweden. Before and after that period the only such position was at KTH in Stockholm. One in the triple proposed the creation of the Nordic Geodetic Commission, which was realized in 1953 and still exists in much the same form as originally proposed.

Keywords: Asplund, Bjerhammar, Nordic geodetic commission, Tengström

1 Introduction

The figure of speech, "The three Swedish Kings of Geodesy," was coined by the former President of the Nordic Geodetic Commission (NKG), Juhani Kakkuri, who recently passed away. During the 1950s through 70s, there were for the first time three professors of Geodesy in Sweden, while traditionally there was only one (at KTH in Stockholm). This was a time with fast development of geodesy, not the least due to new tools such as computers for adjusting geodetic networks and integrating geoid models, new electronic and electrooptical geodetic instruments, and there was the birth of satellite geodesy. The three professors, all born between 1913 and 1917 in the southern part of Sweden, took the lead in this development.

2 Erik Tengström

The oldest in the triple was Erik Tengström, who got his PhD at Uppsala University (UU) in 1954, where he spent most of his academic life and became professor in 1968. He built Hällby Geodetic Observatory, which was his kingdom. He was a Swedish pioneer in satellite geodesy by taking and analyzing satellite Doppler and camera observations, and he was quite active in the International Association of Geodesy, where he was the chairman of three special study groups and finally was a second vice president of the association. He supervised several foreign researchers to a PhD in geodesy, one of which was Ole Remmer from the Geodetic Institute in Copenhagen (GIC).

3 Lars Asplund

Lars Asplund, born in 2014, got his higher education at KTH, where he achieved the doctor's grade in 1945. In his thesis, he adjusted part of the Baltic triangulation network ring around the Baltic Sea (under the umbrella of the Baltic Geodetic Commission). He was employed by the Swedish Mapping Agency (RAK) and appointed head of its geodetic department with professor's title in 1949. He was also a teacher in Higher Geodesy at KTH. At the end of his career he was the Vice President of the Swedish National Land Survey.

Lars Asplund is "the father of the NKG" in the sense that based on his proposal from 1950 the first NKG meeting was held in Stockholm in 1953 (Andersen 2001). Hence, next year NKG should celebrate its 70th year anniversary.

4 Arne Bjerhammar

The youngest in the triple was Arne Bjerhammar, who spent his academic life at KTH with a doctor's grade in 1951 and its professor of Geodesy between 1952 and 1983. In his doctoral thesis, Bjerhammar described his prototype construction of a tachometer, and through the years to follow he worked on several geodetic instrument constructions, some of which lead to patents. However, he is world-wide known for his versatile original developments

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on new methods in geodesy, such as a new matrix algebra with generalized inverses applied in geodesy, pioneering a method in relativistic geodesy starting being realized only today, outlining a coalescent world geodetic system (as a fore-runner for today's World Geodetic System and the GPS) and several other ideas. However, he is most known for his original idea of determining the (quasi)geoid by analytical continuation of surface gravity to an inner ("Bjerhammar") sphere.

For his scientific deeds, he was honored by several national and international prizes and medals (Sjöberg 2021). Scientific discussions with Bjerhammar were always inspiring, intensive and inventive. He used his students and colleagues to test his many new ideas (without paying much attention to student's own ideas and progress). And I will finish my talk by presenting an example of the conditions of studying with Bjerhammar.

In 1969, professor Torben Krarup, GIC, presented his report on a "mathematical foundation of physical geodesy" (Krarup 1969). His primary aim was to prove that Bjerhammar's method in physical geodesy does not work, but he finally approved it and developed it further to collocation. Krarup's report was met with lots of interest and discussion in the research group around Bjerhammar. It was therefore a surprise to everybody that Bjerhammar did not attend a seminar in 1973 arranged by Tengström at the UU, where Krarup presented his report. However, together with two other PhD students I attended and reported to Bjerhammar the next day.

Twenty-five years later (in 1998) I attended the IVth Hotine – Marussi symposium in Trento, Italy, and I was lucky to sit next to T. Krarup at the symposium dinner. When I told him that we were a group of students from KTH visiting his presentation in Uppsala in 1973, he said that he remembered that, and that Bjerhammar was absent. "However, he called me at my hotel in the evening and we agreed to meet at the train station in Stockholm the next day when I waited for my train connection to Copenhagen. I expected that he would like to get a summary of my talk in Uppsala, but to my surprise he was not interested in that. He wanted instead to hear my opinion on some of his new ideas."

5 Conclusions

For long time only KTH in Stockholm had a professor of geodesy, but after the second world war there was quick development of geodesy in Sweden with three professors. However, after Bjerhammar retired in 1983 the only professorship of geodesy in Sweden was again at KTH.

Conflict of interest: Author states no conflict of interest.

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