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IN MEMORIAM

ERIK HERBERT PALMÉN

31 August 1898–19 March 1985

The death of Professor Erik Palmén is a great loss for the geophysical sciences. As a member not only of the "Chicago school" but, in a way, also of the "Bergen school", he was one of this century's major contributors to meteorology and also one of the great figures in oceanography.

Erik Palmén, if anyone, should have written his memoirs. Characteristically, he absolutely refused to do so. However, his interview for the WMO Bulletin (Vol. 30, No. 2, April 1981, pp. 92–100) is probably a good summary of such "memoirs that should have been". Its introductory paragraphs contain a long list of Palmén's memberships in different scientific academies around the world, and the awards and prizes granted to him.

Erik Palmén was born in Vaasa, Finland. He studied astronomy, physics and mathematics at the University of Helsinki and took his Ph.D. in 1927. He worked at the Institute of Marine Research from 1922 to 1947, and from 1939 was the Director of the Institute. In 1947 he received a personal professorship in meteorology at the University of Helsinki. In 1948, when the Academy of Finland was established, Palmén was appointed a life-long member. He then worked for more than three decades at the Department of Meteorology, University of Helsinki, making several shorter or longer visits abroad. Such, in brief outline, was the career of this great scientist.

Erik Palmén became interested in weather while still a schoolboy. Even at the age of 7 or 8 years, he used to follow the movement of the clouds and

changes in weather, sometimes making his own forecasts. He saved money to buy his first barograph at the age of about 10. This keen interest in weather was also very characteristic of him later. The first thing he used to do in the morning after coming to his office (and lighting his cigar, of course) was always to look at the record of his own barograph and other available weather information. He never studied meteorology officially, simply because at the time of his university studies, there was no opportunity to do so in Finland. Hence, as a meteorologist Palmén was a self-made man.

Palmén's first personal contact with the Bergen school was when Tor Bergeron visited Helsinki in 1923 and gave a lecture on the new polar front theory. Palmén was very much inspired by this lecture. His first meteorological paper "Zur Theorie der Zyklonbahnen" in 1923 and particularly his Ph.D. thesis "Über die Bewegung der aussertropischen Zyklonen" in 1926 supported the earlier findings of the Bergen school.

In 1928 Palmén made his first trip to Bergen and his life-long friendship and collaboration with J. Bjerknes began. The main theme of Palmén's meteorological investigations from the time before World War II was the three-dimensional structure and behaviour of extratropical disturbances. During the war, as Director of the Institute of Marine Research, he was engaged mainly in routine activities.

In 1946 Palmén was invited by C. G. Rossby to work at the University of Chicago as Visiting Professor and as co-leader of a research project on the general circulation of the atmosphere. The second, very productive phase of Palmén's scientific career began from this period of the "Chicago school". He stayed in Chicago for about two years, but this visit affected his research much longer.

During his time in Chicago, Palmén contributed importantly to the introduction of the concept of atmospheric jet streams. In his studies, with the aid of the operational aerological data that had recently become available, he gave a synoptic description and a physical interpretation of the extratropical atmosphere. He also became interested in tropical cyclones and in his ensuing papers determined, among other things, the necessary climatological-geographical conditions for their formation.

In 1953–54 Palmén was visiting professor at the University of California at Los Angeles. In the papers which originated from this visit, he concentrated mainly on the problems of the general circulation of the atmosphere, particularly in the tropics. He estimated the intensity of the winter-time meridional mass circulation in the northern tropics using upper-wind data below 700 mb from 19 stations around the latitude 13° N. The estimate he obtained for the intensity of the Hadley circulation, 220×10^9 kg s^{-1}, is well within the margins of error of the corresponding estimates obtainable today.

With his many visits abroad, Erik Palmén was really an international figure. For example, in the 1950's and 1960's he was a visitor often seen in Stockholm at the International Meteorological Institute, founded by Palmén's life-long friend, C. G. Rossby.

Palmén's first oceanographic papers dealt with the hydrography and circulation of the Baltic. In this connection, one of his pioneering contributions of general significance was the method of determining the surface drag coefficient from observations of atmospheric wind over the sea and of the sea level along the coast. In the field of general oceanography he studied the equatorial counter current and the dynamics of the antarctic circumpolar current.

Palmén's work in scientific hydrology consists of his studies on the applicability of the "aerological method" for the estimation of the difference between evaporation and precipitation in limited areas.

Almost all Erik Palmén's scientific papers are observational studies. However, the core of his papers was always the physical interpretation of the observational data and the diagnostic results derived from them. He had an intuitive ability to distinguish important aspects of a problem from minor ones. In many of his pioneering studies, he demonstrated a magical skill of deriving from a small amount of data results which later research, based on a much larger body of data, showed to be essentially correct.

The students and colleagues of Erik Palmén remember him not only as a great scientist and teacher but also as a man with a good sense of humour and an astonishingly wide interest in various aspects of life. They will always treasure warm memories of "Maestro" Palmén. However, the great impact Erik Palmén had on the development of many geophysical sciences will be felt also by generations still to come.

Eero Holopainen