

In Memoriam

Pierre Welander 1925–1996



Pierre Welander has left us. He passed away in his home outside Seattle, USA, in April 1996. He was born in 1925 and grew up in Stockholm, Sweden. After studies in theoretical physics at the University of Stockholm, Sweden, he received his doctoral degree in the mid-fifties.

By this time, Carl-Gustaf Rossby, one of the foremost pioneers in the meteorological and oceanographic fields, had come to the University of Stockholm where he successfully established a Department for the study of oceanic and atmospheric dynamics. Pierre was attracted to the Rossby group and was soon well recognized from

his important contributions to the mechanics of geophysical fluid systems. Like Rossby, Pierre developed extensive contacts with American scientists and was a frequent guest scientist at oceanographic institutes in the USA. In the late sixties, Pierre was appointed Professor at the Department of Oceanography at the University of Gothenburg, Sweden. However, his American connections became stronger, and in 1975, Pierre accepted a Professorship in Oceanography at the University of Washington in Seattle.

Pierre's primary interests were concerned with theoretical analysis of large-scale fluid motions. However, being a creative and excitable personality, he also initiated extensive, and sometimes risky field experiments at sea.

During his first years at Rossby's Institute in Stockholm, Pierre was responsible for the development of numerical forecasts of extreme water levels, and the calculations were performed on BESK, one of the first computers in the world.

This period was synonymous with the development of the modern view of oceanic circulation, which arose from the concepts formulated by the Swedish scientist Walfrid Ekman at the beginning of the century. Pierre Welander was an enthusiastic and inspiring member of the group of scientists that laid the ground for most of our present theoretical insight concerning large-scale motion in the ocean. This group consisted of amongst others, Henry Stommel — who elegantly explained the basic mechanism behind the concentration of oceanic flow to the western boundaries, catalysing a rapid development of our understanding of oceanic motions — and Wilhelm Malkus, Robert Long, Allan Robinson and George Veronis.

A particularly inspiring part of the group's scientific work were the meetings arranged by Pierre at the old research station on Bornö in

the inner part of the Gulmarfjord, north of Gothenburg.

It is hard to rate the extensive work done by Pierre Welander. However, from my perspective, I do attach a special importance to Pierre's work concerning the thermohaline circulation. His pioneering paper '*An advective model of the ocean thermocline*' in *Tellus* (1959) is not only Pierre's first paper on the subject but also presumably one of the first attempts to attack the thermocline problem with the tools of applied mathematics. Pierre kept his interest in the deep thermohaline circulation alive throughout his career, as demonstrated by a publication in *Tellus* (1988) (together with Marotzke and Willebrand) concerning the possible nonuniqueness of specific thermohaline states (c.f., Geophysical Fluid Dynamics, 1973).

It should also be noted that at an early stage, Pierre recognized the importance of potential vorticity mixing, a phenomenon considered of fundamental importance for the atmosphere.

Pierre Welander was, despite his prominence and indulgence in the theoretical analysis of complex problems, a playful and easygoing person with his young mind well preserved. When Pierre was expected back after one of his many trips overseas, anything could happen. Always full of provocative ideas, he was a master of cheering up the department and creating a relaxing and pleasant atmosphere. We have indeed lost a great scientist and a warm and stimulating human being.

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