

## OBITUARY



HERFRIED HOINKES 1916–1975

PROFESSOR Herfried Hoinkes, Ordinarius für Meteorologie und Geophysik in the Philosophischen Fakultät of Universität Innsbruck, died on 4 April 1975 suddenly and completely unexpectedly, in the middle of his work, a few weeks after his 59th birthday.

Hoinkes was born on 9 March 1916 in Bielitz, then part of Austrian Silesia. He studied meteorology, geophysics, mathematics, physics, geology, and philosophy in the Universities of Königsberg and Innsbruck, in the second of which he received the degree of Dr. phil. in meteorology, geophysics, and physics in 1940. Already in his student days he had shown his love of the mountains, and as early as 1938 he took part in surveying the glaciers in the Rofental in the Ötztaler Alpen. However at that time Hoinkes did not know that these mountains would become his research subject; that he would appropriate to himself as his own scientific life work the systematic study of the relation between glaciers and climate.

He was able to continue his scientific investigations for only two years after graduation. In 1942 Hoinkes was drafted into the Marine-Wetterdienst, so he could only continue his work after the end of the second World War, in however extraordinarily adverse circumstances, as no places were then available at the Institut für Meteorologie und Geophysik. His extreme devotion to scientific research is shown by his not giving up his academic studies

at this point, but instead continuing to work for his habilitation in meteorology and geophysics in the Universität Innsbruck, which he achieved in 1949.

In 1950 the most significant phase of his scientific work in glaciology began. With the evidence of the massive glacier recession in the years before 1950, and stimulated by the publications of his former professor, Arthur Wagner, Hoinkes felt the scientific need to make systematic micrometeorological studies on alpine glaciers to establish the sources of energy for the ablation process. Together with Norbert Untersteiner he made the first studies of the heat balance during an 11 d period in August on the Vernagtferner in the Ötztaler Alpen. Already at this stage Hoinkes was clear that systematic studies of the heat balance would only be a first key to unlock the problems of glaciers and climate. It is typical of Hoinkes as a scientist to have considered the fundamental physical roots of this problem. Hoinkes thus contributed decisively to the turn from qualitative description to quantitative explanation in glaciological research at a time when the rheology of ice also received a new impulse from physical science.

His early works are of particular significance in the distressing post-war period. They were conducted without the technical assistance now taken for granted. Loads had to be carried Sherpa-style by himself to the site on the Vernagtferner 2 973 m a.s.l. On the basis of these and other micrometeorological studies above the melting glacier surface, false ideas concerning the energy sources and sinks in the heat balance of Alpine glaciers could be corrected. In his comprehensive publications he showed that the glacier wind does not correspond to a "cooling" situation, but rather that it allows a much larger flux of sensible heat than occurs during a gradient wind, that the contribution to ablation by evaporation is negligibly small, whereas latent heat of condensation can make a significant contribution to the ablation. The dependence of the long-wave radiation balance on cloudiness and the significance of the albedo in the radiation balance were established conclusively.

As a participant in the tenth General Assembly of the Union Géodésique et Géophysique Internationale in Rome in 1954, Hoinkes was able to present his results on heat-balance studies on alpine glaciers before a large circle of international glaciologists for the first time during the meetings of the International Commission of Snow and Ice. At the same time several plans for expeditions were initiated. In 1956 Hoinkes was appointed a member of the foundation committee of the *Expédition Glaciologique Internationale au Groenland in Grindelwald* and took responsibility for the glacio-meteorological programme of that expedition, while in December of the same year he himself initiated a glacio-meteorological programme at Little America V in the Antarctic under the auspices of Operation "Deep-freeze" during the International Geophysical Year, and continued this until March 1958. These expedition experiences, including a flight to the South Pole and to "Byrd" station, deepened his scientific interest in the study of the world's ice. Just as Hoinkes was confronted in the Alps with the problem of glacier retreat, so in Antarctica he was confronted with the problem of the cause of ice ages. In exceptionally brilliant papers which were illustrated with the most dazzling slides, Hoinkes sought to make problems of glaciological research comprehensible to the general public.

Further international responsibilities must not be omitted. During the thirteenth General Assembly of U.G.G.I. in Berkeley, Hoinkes was elected President of the International Commission of Snow and Ice for the period 1963–67 and one year later was elected Vice-President of the Glaciological Society for the period 1964–67. Hoinkes took his responsibilities very seriously. In 1962 he organized for the International Commission of Snow and Ice the symposium on variations of the regime of existing glaciers at Obergurgl in the centre of his research area.

For mass-balance studies to accompany the glacio-meteorological studies, the Hintereisferner was an obvious choice because of its classical position in glaciological research. In studying the interplay between glaciers and climate, mass-balance measurements are essential.

“Nur Schwankungen im Massenhaushalt eines Gletschers stehen in unmittelbarer Beziehung zu Schwankungen der klimatischen Umwelt” wrote Hoinkes in 1970. Since length measurements alone can give no unique insight into their causes and processes because of the complex phenomena in which ice rheology plays a part, the very laborious process of determining the mean specific balance by the glaciological method had to be undertaken. Only those who have done it can understand how much labour had to be expended to obtain the series of measurements beginning in 1952/53. This series of measurements, setting the example in the Alps, served as the basis for a network extending round the world now in progress and seemingly very promising. “Neue Beiträge zum alten Problem der Beziehungen zwischen den Schwankungen der Gletscher und der klimatischen Umwelt hier in einem längeren zeitlichen Ablauf einordnen zu können” as Hoinkes wrote in 1970. With this series of measurements Hoinkes made a significant contribution to the programme of the International Hydrological Decade on the combined heat, ice, and water balance.

Already at the beginning of his glacio-meteorological work, the idea appears that the most probable cause of the general retreat of glaciers is to be found in the increased general circulation of the atmosphere. The scientific evidence for this was discussed by Hoinkes in several publications belonging to the theme “glacier variation and weather”. The state of the general atmospheric circulation was described by Hoinkes using a classification of the general weather conditions, whose frequency for each year since 1881 was determined. In this way the problem of glacier variations was analysed not only from the standpoint of microscale analysis, but also from that of macroscale analysis. As Hoinkes wrote in 1968 “There is a gap to close between the micro-dimension (heat budget) and the macro-dimension (glacier-climate relations) of glacial meteorology. The connecting links are the largely neglected glacier-weather relations in the meso-dimension of glacial meteorology”. This gap should be closed by individual parameters from the climatological data of a station near the glacier, so that a prediction of the mass balance of an individual glacier becomes possible, “without having to step on the glacier” as Hoinkes often jokingly put it.

The great significance of Hoinkes’s glaciological work lies without doubt in that he saw problems with a wide perspective in the Earth sciences. It is for example very instructive to read the published introductions that Hoinkes delivered to the symposium on scientific aspects of snow and ice avalanches in Davos in 1965 and to the fourteenth General Assembly of U.G.G.I. in Bern in 1967 in his capacity as President of the International Commission of Snow and Ice. It was always for him a personal duty to illuminate the historical dimension of research and his speeches reflected a deep respect and understanding of early pioneering work in glaciological research. He sought fruitfully to bind together tradition and advance in research. He sought always to expand the boundaries of a one-sided specialization. He promoted glaciological research as a truly interdisciplinary science.

With a full sense of responsibility for the tradition of glaciological studies in the Alps he undertook with H. Kinzl the editing of the *Zeitschrift für Gletscherkunde und Glazialgeologie* after R. von Klebelsberg’s death in 1970. He was also a member of the editorial board of the journal *Umschau*, and a member of the scientific committee for the journal *Polarforschung*. Until 1974 he served as correspondent in Austria for the International Glaciological Society.

Field work and excursions took him to the glaciers of New Zealand, Alaska, Scandinavia, and the Caucasus. Everywhere he had a special eye for local phenomena. His experience in the Antarctic probably left the deepest impressions on him. Two excursions to the western Alps that he made in 1964 and 1974 with Swiss colleagues as co-workers remain unforgettable. As a university teacher he was able to inspire young students through brilliant lectures, drawing on his own scientific work for examples. From his appreciation that the lack of education for glaciological research is a very difficult problem to solve, after R. Finsterwalder’s death he, together with W. Hofmann and H. Heuberger, undertook the responsibility for continuing the “Kurs für Hochgebirgs- und Polarforschung”.

His academic career as a Professor began in 1956 immediately before his Antarctic expedition, when he worthily succeeded Albert Defant as Director of the Institut für Meteorologie und Geophysik of the Universität Innsbruck. Two years later, in 1958, he was advanced to become Ordinarius. Within the Faculty Board he was an active and particularly strong personality, so that for the academic year 1963/64 he was elected Dean and from 1972/73 until 1974/75 Senator.

High awards and numerous memberships of different scientific academies and commissions gave recognition to the quality of Hoinkes's work at home and abroad. Thus the Austrian Ehrenkreuz für Wissenschaft und Kunst, 1st class, was awarded to him as long ago as 1958, as was the Rüppel medal of the Frankfurter Geographische Gesellschaft (1961), and the Hann gold medal of the Österreichische Gesellschaft für Meteorologie (1975). Hoinkes was a member of the Deutsche Akademie der Naturforscher Leopoldina in Halle (1961), corresponding member of the Bayerische Akademie der Wissenschaften in München (1964), of the Akademie der Wissenschaften und Literatur in Mainz (1966), and of the Österreichische Akademie der Wissenschaften in Wien (1967).

His name and his works will long endure in glaciology. To those who follow it remains to build on further particular points in glacio-meteorological study. Everyone who knew Hoinkes will realize that he had absolute respect for the work and thought of others and will bear in mind the clear and exemplary objectivity of his judgement. A high sense of responsibility and a strong drive to creative scientific work, in which intuition and logic were so ideally combined, formed this great personality. His seriousness at work and his deep sense of humour complemented one another ideally. These qualities made him respected among the glaciologists of the world and won him many friends.

His fatherly kindness which used to encourage us, the younger generation, to continue our work, will stay for ever in our memories. It was an extraordinarily rich life, imbued with the humanistic ideal of education, that ended so unexpectedly. Individual freedom was one of his highest principles, but the desired degree of freedom will lead to constructive action only if the sense of duty in the individual is as profound as it was in Hoinkes.

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