

POLISH POLAR RESEARCH	10	3	263—266	1989
-----------------------	----	---	---------	------

Andrzej KARCZEWSKI, Andrzej KOSTRZEWSKI and Wojciech STANKOWSKI

Quaternary Research Institute
Adam Mickiewicz University
Fredry 10
61-701 Poznań, POLAND

Research problems tackled by expeditions
to the region between Billefjorden and Austfjorden
of the Quaternary Research Institute
of the Adam Mickiewicz University of Poznań
over the 1984—1987 period
central Spitsbergen

Systematic geomorphological and geological research conducted in Spitsbergen by Polish groups has a long tradition. An important feature of the research is that it concentrates almost exclusively on the western coast of the island strongly affected by the ocean. The staff members of the Quaternary Research Institute of the Adam Mickiewicz University of Poznań have taken up study in the interior of Spitsbergen where continentality is experienced. They have chosen an area between Billefjorden and Austfjorden to which four expeditions were organized over the 1984—87 period.

The aim of the expedition arranged in 1984 in collaboration with scientists of the Institute of General Geology and the Institute of Hydrogeology and Engineering Geology of the Warsaw University was to acquire general knowledge of geomorphologic and geologic characteristics of regions around Petuniabukta and Adolfbukta. Systematic mapping of the region between the Billefjorden and Austfjorden was then begun. Fieldwork was carried out by two independent research groups. One investigated an area from Hörbyedalen as far as the Ebbadalen outlet, whereas the other worked between Ebbadalen and the northern extremity of Nordenskiöldbreen. Rather extensive material was provided concerning paleogeography and geomorphology of the whole area.

In 1985 the expedition attention focussed upon the present-day denudative system in the polar region. The staff members of the Quaternary Research Institute of the Adam Mickiewicz University were joined by a research worker from Poznań Academy of Agriculture who performed meteorological observations and a research assistant from the Institute of Physical Geography at the Adam Mickiewicz University, who made hydrological obser-

vations. The research was directed towards chemical and mechanical denudation at water-gauging stations which closed the Ebbabreen and Bertram-breen catchments, 49.5 sq km in surface area, and a small non-glaciated catchment of so called *Dynamiskbekken*, 1.42 sq km in surface area, in the Wordiekammen massif. Permanent meteorological, hydrological and hydro-chemical observations revealed relations in the operation of present-day processes within the context of temporal and spatial variations in ablation rates for snow and ice covers. The resulting models of interrelationships between discharge and dissolved or suspended sediment concentrations enabled water runoff, mechanical and chemical denudation to be estimated for the catchments under investigation.

The members of the '86 expedition representing only the Quaternary Research Institute of the Adam Mickiewicz University examined the marginal zone of Hörbyebreen and participation of proglacial water in building outwash and tidal plains around Petuniabukta. One of the reasons for the main concern with the Hörbyedalen region is the fact that Hörbyebreen is the only glacier in the study area subject to intense areal disintegration of the marginal zone. Moreover, Hörbyedalen and Ragnardalen constitute the key area where interactions between marine processes and glacial events are traceable at the landward end of Billefjorden. A considerable amount of supplementary material from the area surrounding Petuniabukta, and from Ragnardalen and Ebbadalen was obtained. It proved essential in compiling the planned geomorphological map of the study area.

The staff members of two institutes of the Adam Mickiewicz University, *i.e.* the Quaternary Research Institute and the Institute of Physical Geography, went on another expedition in 1987. They were concerned with the marine, glacial-fluvioglacial and lacustrine morphogenesis of the northern portion of the region between the Billefjorden and Austfjorden. The study area extended from Hoglandvatnet as far as Austfjorden. Hydrochemical studies were undertaken on a wide scale. Hydrological fieldwork was carried out in Petuniabukta and the mouth section of Ebbadalen where geocomplexes were surveyed. The eastern fringes of Petuniabukta were covered by a geodesic network and raised marine beaches were subjected to geodesic measurement. Further observations were made over the whole area between the Billefjorden and Austfjorden for the task of compilation of a future geomorphological map.

The research themes that absorbed the attention of all expedition members of the Quaternary Research Institute were related to the main aim that included the compilation of a geomorphological map in combination with paleogeographical comments on the entire region between Billefjorden and Austfjorden.

The field studies, laboratory investigations as well as preparation of papers were supported by the Polish Academy of Sciences Research Project — CPBP 03.03.