

Japanese Glaciological Studies in Antarctica

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Abstract: It was during the fifth Japanese Antarctic Research Expedition of 1960–1962 that the glaciological section was established officially. In spite of the absence of a glaciological section prior to this time, many scientists attempted studies on glaciological problems since the first expedition. Various studies were made on such problems as the evaporation of snow blocks, the formation of puddles, the dynamics of blowing snow, the formation of sastrugi, the flow of glacier, the orientation of crystal axis of glacier ice, etc. The results have been published previously. The studies which involved a tremendous amount of effort were the measurements of thickness of the continental ice sheet in the vicinity of the Mizuho Plateau which is located to the south of Syowa Station. The third and fourth expeditions made these measurements by seismic sounding and the fifth expedition made their measurements with the aid of a gravimeter. The fifth expedition built a small self-recording observatory at about thirty kilometers to the southeast of Syowa Station. At this place, the temperature of the snow from the surface to a nine meter depth was measured by copper-constantan thermocouples taking the temperature of snow at the ten meter depth as a standard. Recording was made once a day throughout the year. The temperature of snow at a ten meter depth was measured by an electric resistance thermometer six times that year. The mean temperature was -16.6°C . As a part of studies on sea ice in the neighbourhood of Syowa Station, a growth of sea ice was observed on the leeward side of the iceberg where no snow was deposited. The results on sea ice were compared with the accumulated temperature below the freezing point of the sea water. Accumulation of snow on sea ice was observed by stakes set up on a line twelve hundred meters in length. The vertical pit walls in the previously deposited snow were dug in August and December, and the density, temperature and hardness at each depth were measured. The vertical sections of some sastrugi were made and the pattern of accumulation layers was observed.