Colleagues have suggested that the craters represent points of rapid ablation where, at the bottom of tension cracks in the ash at the summit of the cones, insolation can reach the *névé* without encountering a 10 cm. thick insulating blanket. However, such a proposal fails to explain how more than 77 cm. of ash came to be in one crater measured and how, if infall of ash were responsible for the fill, the overlying ash still maintained its normal 10 to 13 cm. thickness. It is doubtful that wind blown ash could have filled the craters since no evidence of wind shifting of the ash was noted, and the depressions between hummocks were not drifted full. The moist ash would not have been easily blown about.

An effective explanation of the cratered debris-covered ice cones must await further observations, and the author would appreciate information from others who have observed similar phenomena.

An interesting sidelight is provided by the preservation of the snow of 1944–45 as *névé* under the ash while subsequent snowfalls melted completely.

MS. received 10 *March*, 1955

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COMMENTS ON MR. McALLISTER'S PAPER

By W. V. Lewis

(Department of Geography, Cambridge University)

The interesting debris-covered ice cones described above would seem, as Mr. McAllister suggests, to have post-dated the fall of ash. The cracks in the ash layer are very similar to those which form when any fairly thick layer of predominantly fine covering material subsides by differential melting of the underlying ice or firn. The association of the craters with the cones in all twenty cases examined suggests that this association is no mere coincidence but rather that the two features are associated by cause and effect. If we therefore assume that the craters containing the ash formed first, then the cones fall into the general category of such features now well described and well understood. On this interpretation the cones result from the retarded ablation of ice surrounding the ash-filled pockets, retarded by the mantle of extra debris which spreads down the sides of the ever-growing cones as the upper parts of the ash pockets find themselves unsupported by the down-melting of the enclosing ice. If this be so, the problem is to account for the ash-filled pockets. The firn or ice surface may have been previously pitted by the down-melting of sporadic patches of dust dark enough to absorb radiation readily, but not thick enough to insulate the underlying ice. Given such pitting I do not think it impossible for drifting ash to fill or partly fill the little pits to a greater depth than that of the ash covering the general surface of the surrounding firn or ice, much as occurs when snow drifts into little hollows. Only in relatively still air would one expect the thickness of the ash to be more or less uniform, over a relatively restricted area, irrespective of surface irregularities. But I do not think it likely that such deep and closely spaced pitting would be a natural condition of a glacier surface. Lesser irregularities there may have been at the time of the eruption, and hot ash falling in the hollows may have melted its way downwards, provided the melt water could get away, and encouraged further hot ash to drift into and further deepen the hollows. The deep cylindrical pits may represent deeper penetrations in the centres of larger, less regularly shaped hollows which had melted away by the time the observations were made in 1948. But this is mere speculation prompted by this most intriguing problem that Mr. McAllister has posed.

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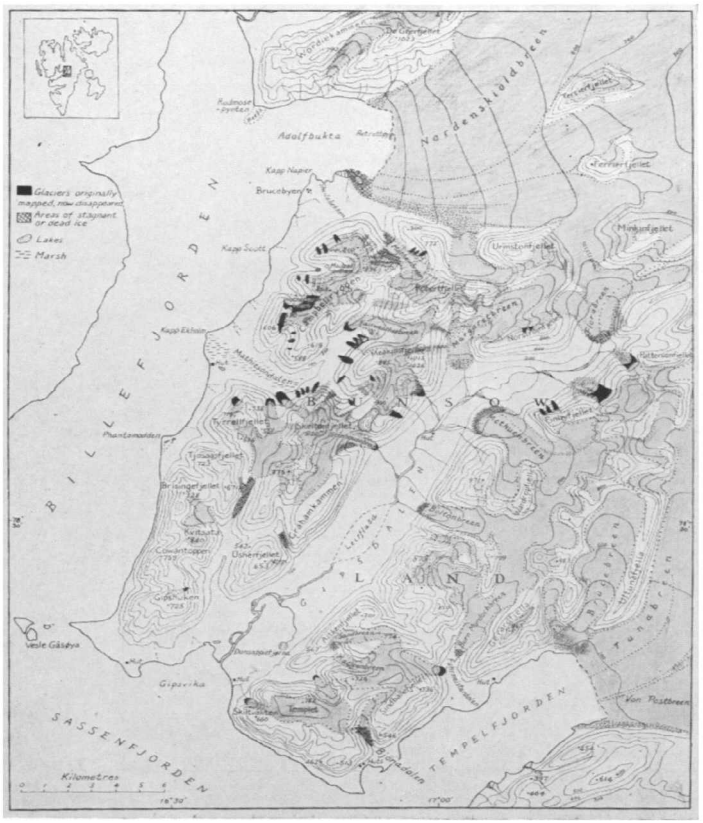
Fig. 1 (above). Two connected ice cones with ash cover removed. Note technician's hand in crater. Hummocky surface with tension cracks at crests of cones clearly shown (see p. 631)

Fig. 2 (right). Cone free of ash, showing crater, and surrounding cones beneath ash cover. Lighter colored crests are probably due to downward drainage of water in the ash



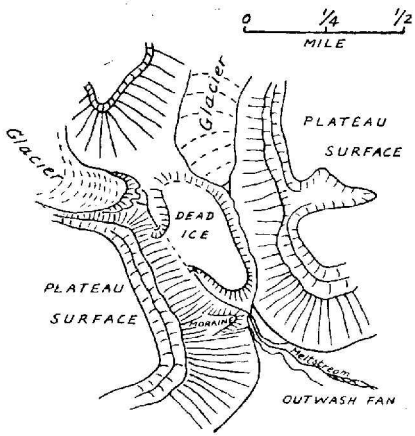


Fig. 1 (left). Bünsow Land, central Vestspitsbergen (see p. 640)

Fig. 2 (above). Bjönadalen (see p. 641). 1 mile = 1·6 kilometres

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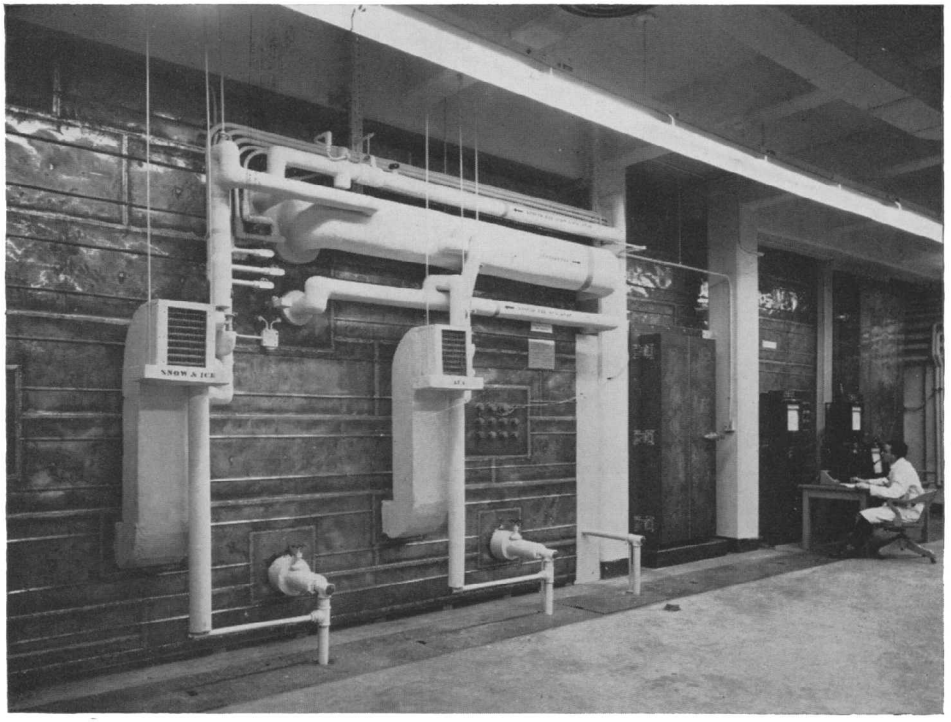

Fig. 2. A view of the back of the snow and ice cold room showing the piping for the refrigeration equipment, the ventilation ducts and one of the service panels. On the right is seen the front of the second cold room and associated temperature indicators and controllers

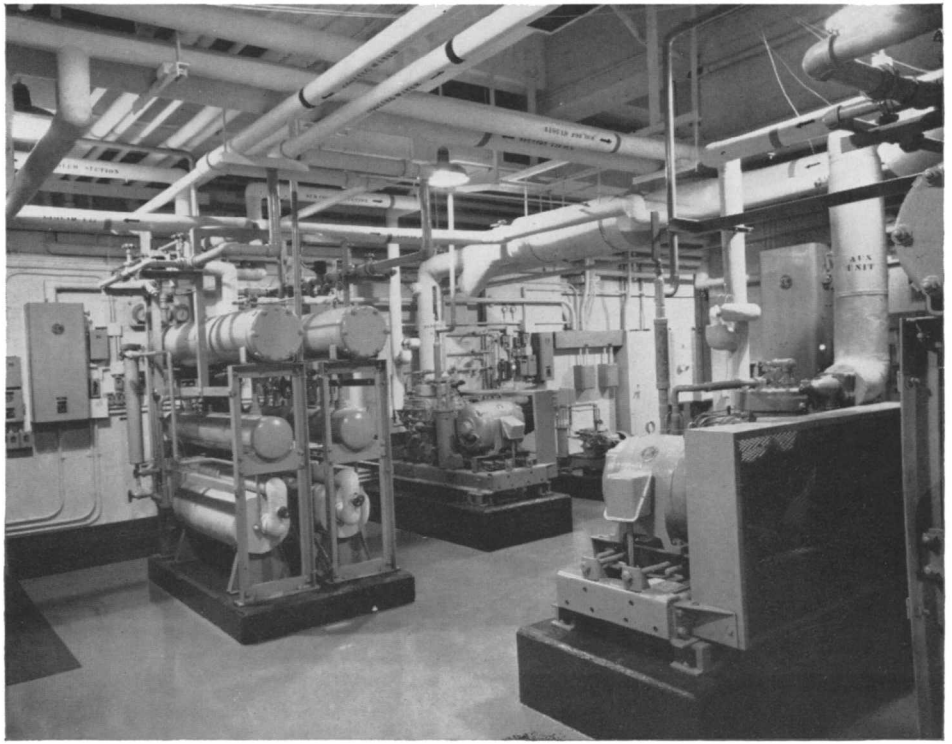

Fig. 3. A view of part of the mechanical equipment room showing two of the 30-horsepower compressors with their associated equipment

Photographs by the National Film Board of Canada

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