

# Radio echo sounding in western Dronning Maud Land, 1974

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For the fourth year in succession a programme of radio echo sounding was undertaken in western Dronning Maud Land during the austral summer of 1974-75. The oversnow traverses covered about 500 km in the Ahlmannryggen area (Fig. 1). This is the last in the present series of reports which has appeared in this Journal since 1972.

## Equipment and procedures

For these traverses the same echo sounder as before was used. It is a Scott Polar Research Institute Mark II (Schaefer, 1972, 1973) with two folded dipole antennae fed in parallel to increase the vertical gain (Van Zyl, 1973).

Position was determined along the traverse routes by resection with a prismatic compass on available maps of the area (Norsk Polarinstitut, 1961, 1962). Save in the areas where sharp changes in relief made intermediate readings necessary, altitude determinations were made every 3 km with two Fues Barolux barometers and alcohol thermometers. The barometers were calibrated against a mercury barometer at Sanae at the beginning and the end of the season, and they were compared with each other regularly to check for drift or damage. The single-base method derived from Laplace's formula was used, with the hourly meteorological observations at Sanae as control.

The computed barometric altitudes were compared with known elevations in the area. The method used and the distance between Sanae and the field stations (up to 250 km) at times gave rise to large errors (5-10%), especially during the meteorologically unstable winter-summer transition period. Altitudes that were obviously inaccurate were discarded and those from the 1:250 000 topographical maps (Norsk Polarinstitut, 1961, 1962) were interpolated for the construction of the subglacial profiles. Schaefer (1973) estimated that the ice depths obtained by radio echo sounding are accurate to within 5 per cent.

## Results

The traverse routes were chosen to fill in detail between previous traverses (Schaefer 1972, 1973; Van Zyl 1973; Schönfeld & Van Zyl 1974) and to avoid areas with ice

depths exceeding the echo sounder's range of about 1 700 m. Echoes were obtained over most of the distance traversed except across the deeper ice of the Viddalen between points V12 and V15. Neither the outward nor the return traverse yielded usable results, and a third crossing (V72 to V20) along a different route was only partially successful (Fig. 2i). It was intended to continue route V89 to V97 southwards in the direction of Pyramidene, but this had to be abandoned on account of bad crevassing at V97.

The few cases where echoes faded in relatively shallow ice (Fig. 2a, j, l, m) could possibly be attributed to a high moraine content of the ice or to poor contact between ice and bedrock.

## Acknowledgements

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## References

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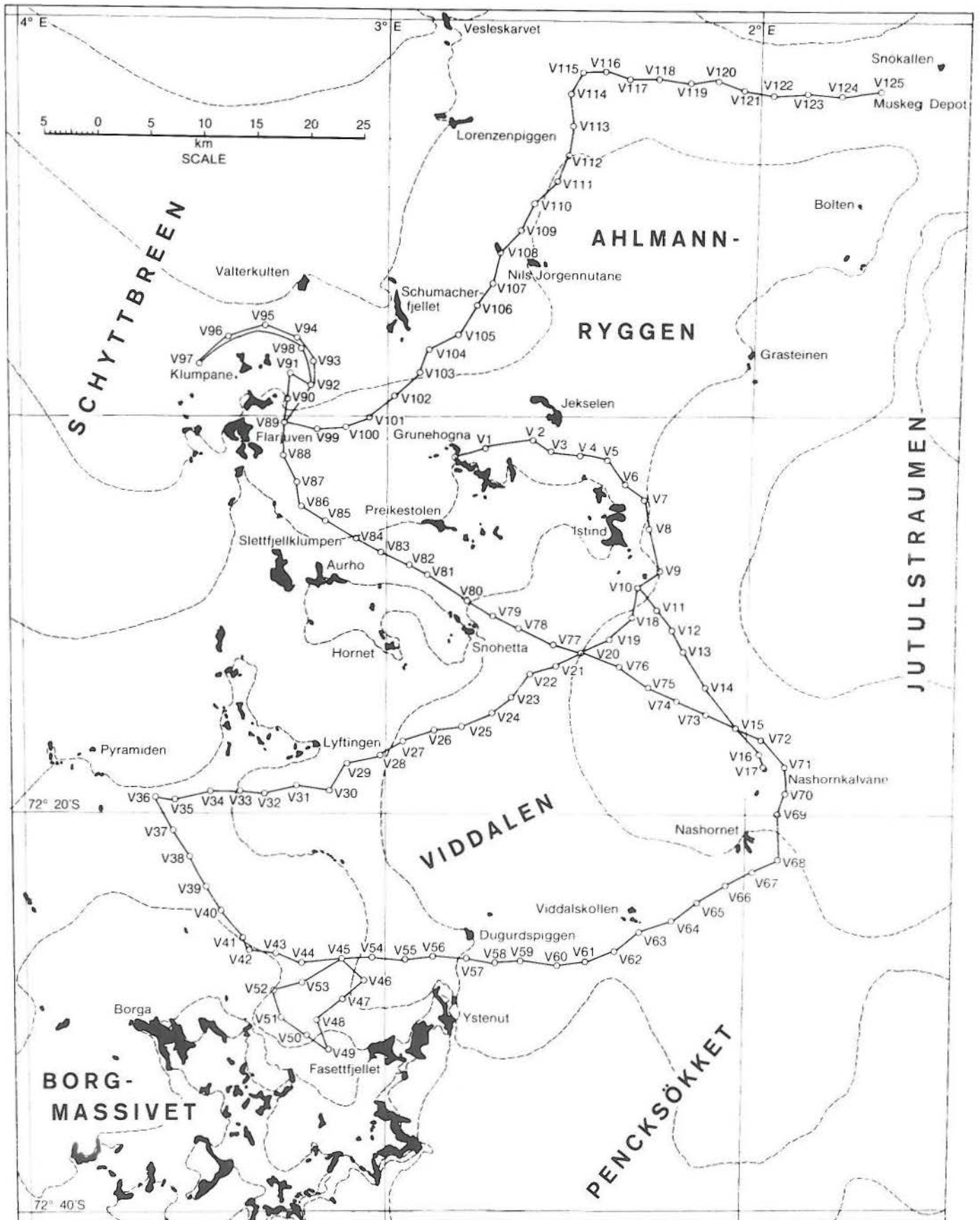


Fig. 1. Routes traversed in the Ahlmannryggen.

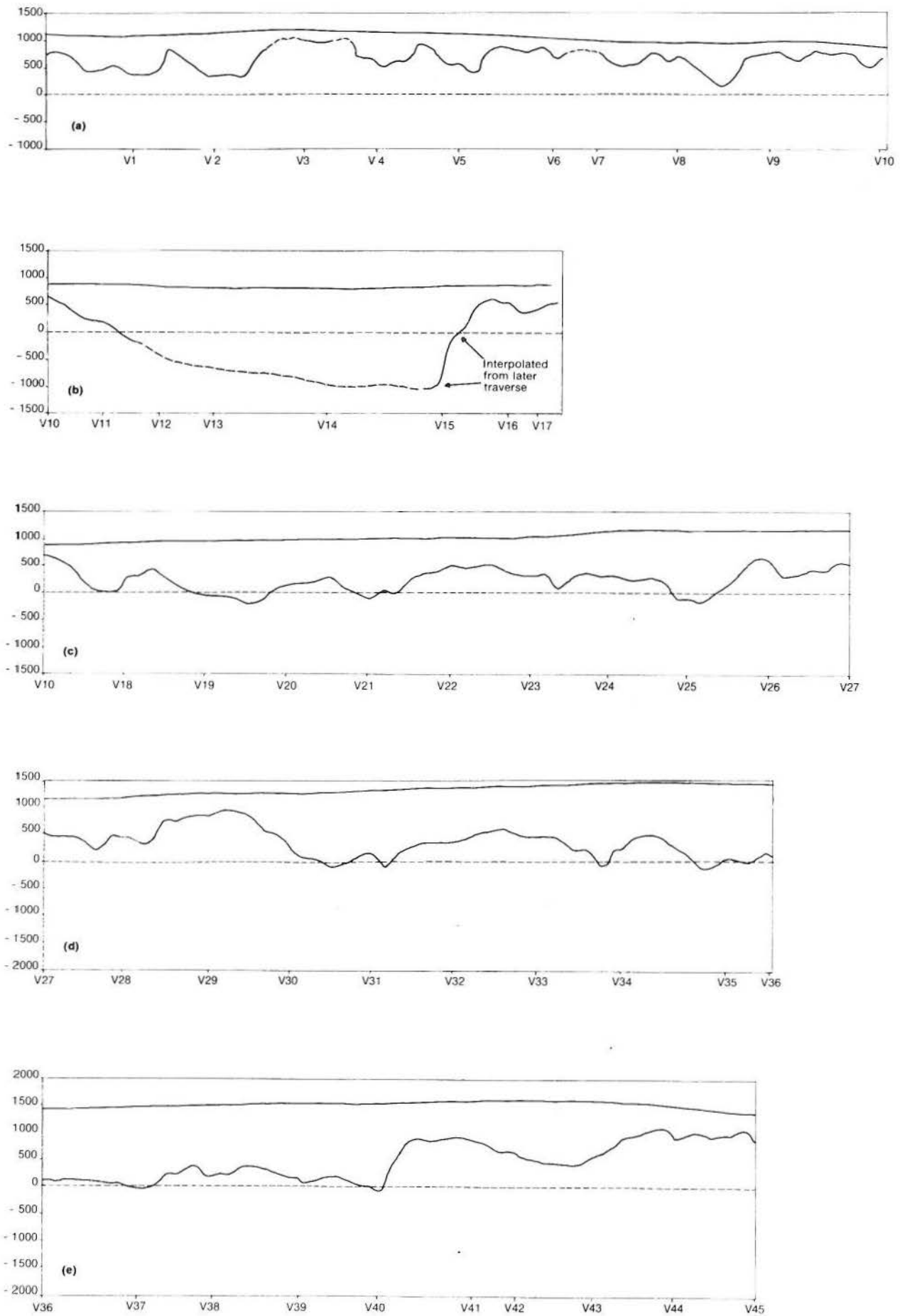


Fig. 2. Profiles of surface and subglacial topography.



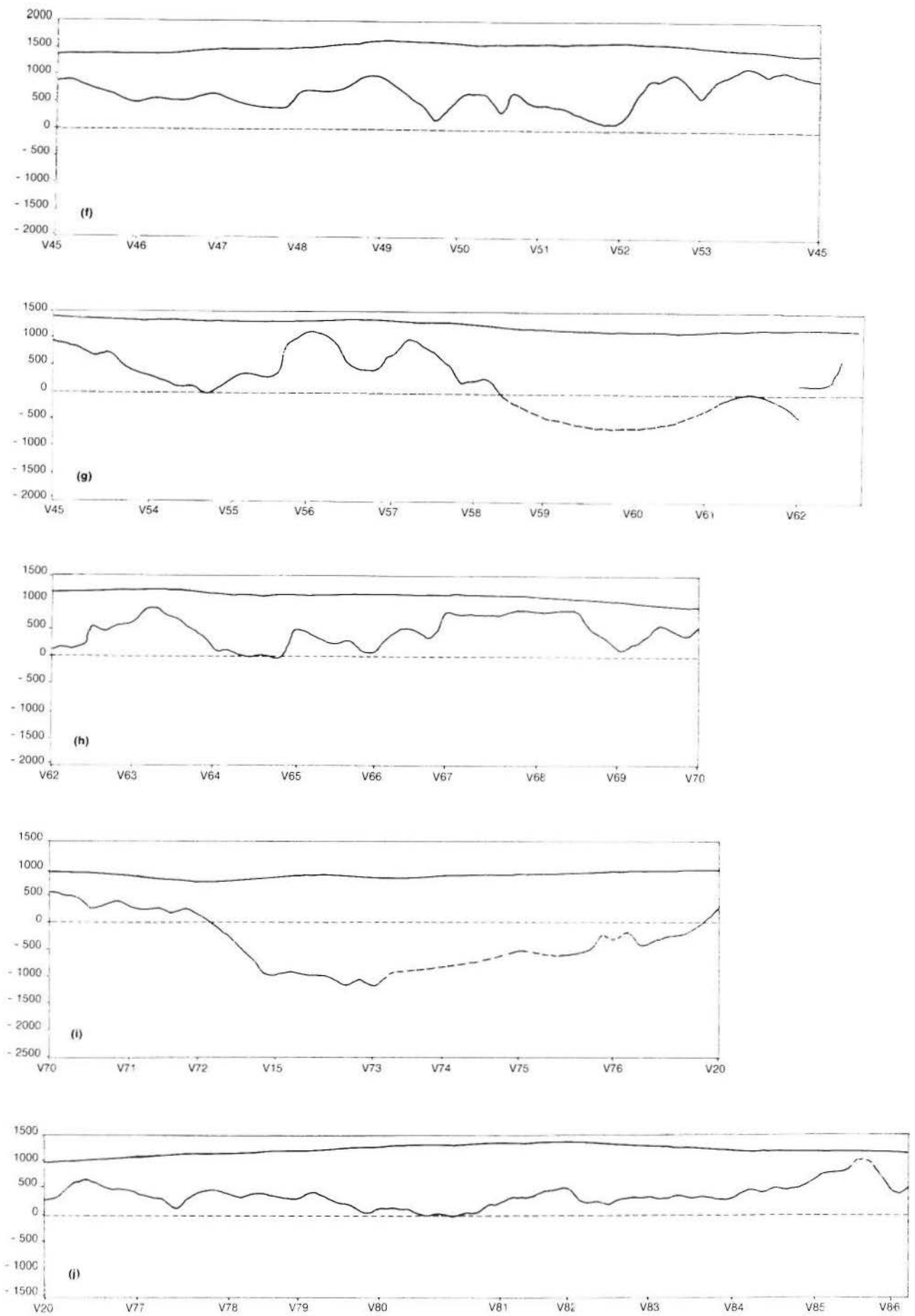


Fig. 2 (continued) Profiles of surface and subglacial topography.

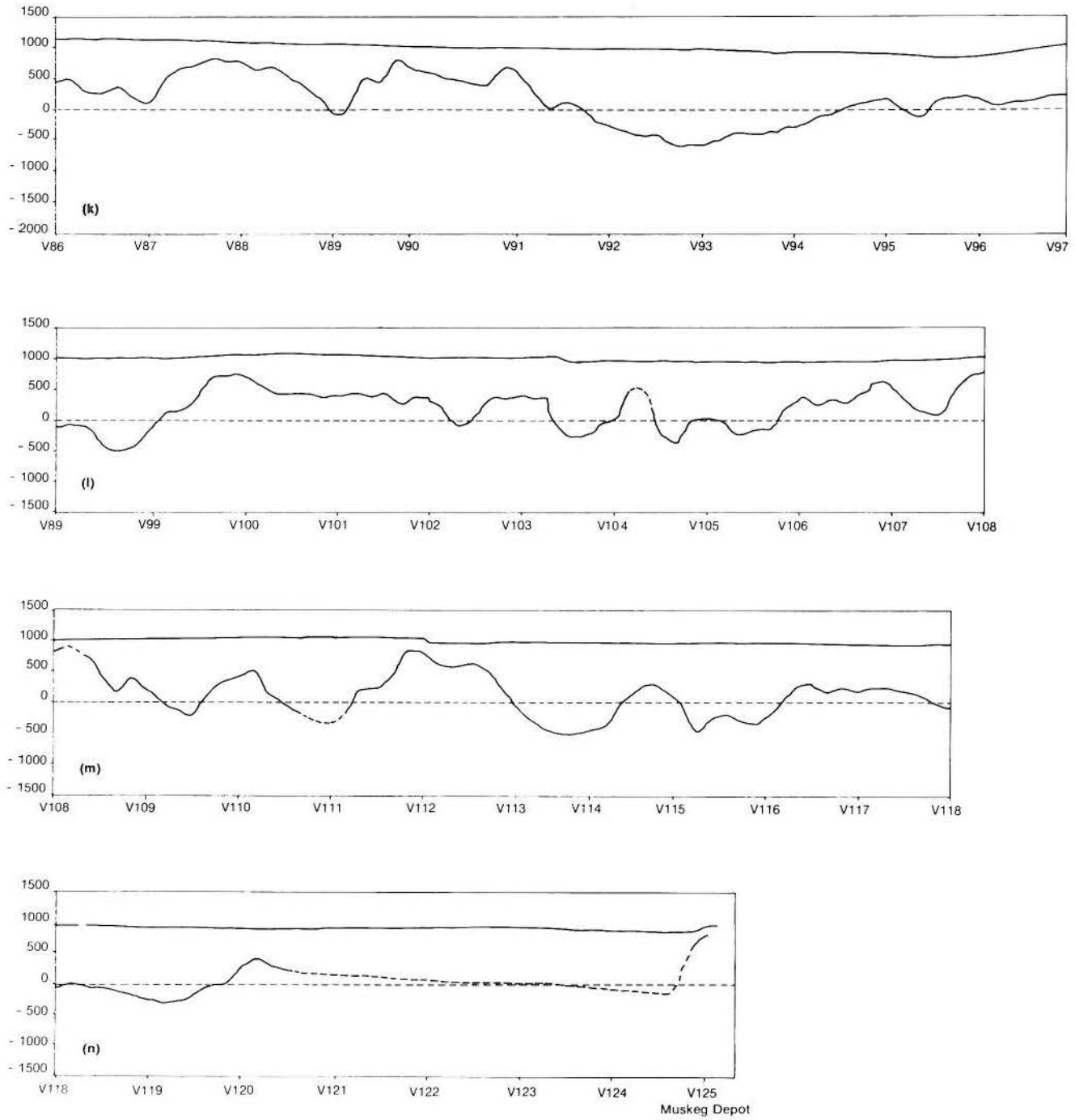


Fig. 2 (continued) Profiles of surface and subglacial topography.

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