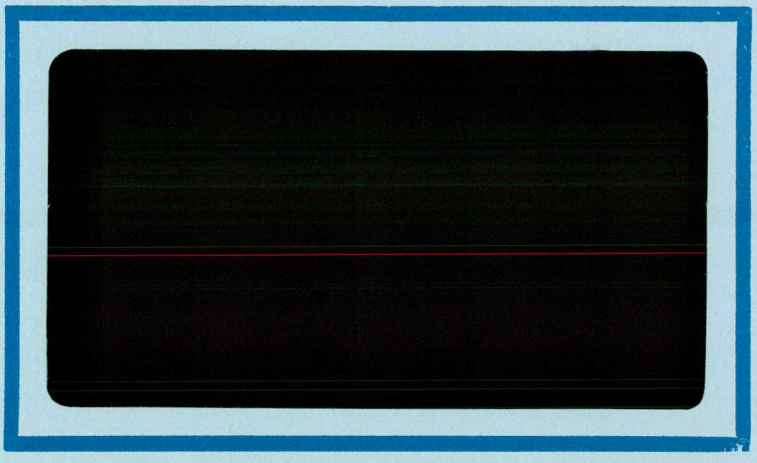
UNIVERSITY of CAMBRIDGE



Department of Engineering

Preliminary Report

CAMBRIDGE STAUNINGS

EXPEDITION 1972

D.W. Matthews,
Peterhouse,
Cambridge.

K. J. Miller,
Trinity College,
Cambridge.

December 1972.

PRELIMINARY REPORT

Cambridge Staunings Expedition 1972

The twelve members of this expedition gathered at Glasgow Airport late in the evening of July 10th for an overnight flight to Iceland. At Rejkjavik they met up with their delicate scientific equipment which had been brought over on the m/v Gullfoss by the Cambridge Schuchert Expedition. On July 12th, after some delay for bad weather over Greenland and the Denmark Sea, the two expeditions together with the Dundee North East Greenland Expedition and the Imperial College Expedition embarked on a chartered DC6B aircraft and flew to Mestersvig in East Greenland.

Arrangements and unloading in Mestersvig took very little time, thanks to the help and co-operation of the staff there, and the two Cambridge expeditions were able to start their combined walk-in to their respective Base Camps by midday July 13th. Conditions were moderately poor at this stage, with heavy melt in full swing, and with deep thawing snow on the Mellem Pass, but the snout of the Roslin glacier was reached in five days, and the expedition reached its base camp on the following day, July 19th. Arrival at base coincided almost exactly with the arrival of the RAF Hercules, smoke flares were soon in position, and nine parachute loads were dropped in perfect weather conditions.

Preparations for scientific work started immediately camp had been established, and the old 1970 depot unpacked. Unfortunately the two parachute loads of fuel were found to be extensively damaged and much of the diesel fuel was lost. All other equipment was in perfect condition, and with the arrival of the delicate instruments by helicopter from Mestersvig, all the scientific programmes could get under way.

During the four weeks spent at Base Camp, virtually the whole of the main scientific programme was completed, in spite of deteriorating weather in the second half of this period. In fact the summer thaw did not reach its normal extent throughout this season, and for a time the snow morass in and around Base Camp was extremely trying. The scientific results will be published in due course in the full expedition report, but for the purposes of this report the following summary is given.

1. Ice depth, radio-echo sounding. A new design of sledge was built using light-weight materials, and the central section of the Roslin Glacier and the Roslin-Dalmore Glacier junction areas were covered by traverses. On the whole the electronic equipment gave very little trouble, and the new sledge withstood the rough conditions very well. All film records were developed in Base Camp as the work proceeded. Peter McKeith and Roger Camrass were chiefly concerned with this work, aided by numerous other members who man-hauled the sledge.

2. Steam probe. A portable steam generator, rigid probe, and 20 metres of flexible hose, were put to most effective use by John Thorogood. The probe was used for drilling stake holes, and deep holes for temperature measurement, and was also put through a comprehensive series of tests for optimisation of its design in respect of operating pressure, nozzle design, and probe construction.

3. Electrical deep probe. This programme was expected to be severely handicapped by lack of fuel for the generator. However, in the event, the four newly designed probes brought out for trial would not, for some reason, penetrate to anywhere near the depth expected. Keith Rose devoted all his time firstly to attempting a full descent of the probe, and later to systematic tests to ascertain the reasons for the difficulties experienced.

4. Survey. Throughout the time at Base Camp, Tony Way was engaged in primary survey, and measuring the 1970 stake lines, as well as drawing up profiles of the glacier surface to complement the radio-echo sounding results. All the sledge runs were plane tabled by two members from Imperial College (financially independent of this expedition but assisting this particular project.) A complete plane table map of the Roslin-Dalmore junction area was drawn up.

5. Heat Balance studies. A camp was set up on the glacier surface, and the humidity, sunshine, temperature, wind direction and speed, and ablation were observed every six hours throughout the expedition, to assist in the overall study of this glacier system.

Other items of work were carried out at various times, such as mechanical drilling of new stake holes, radio communications trials, and the ascent of

several peaks and survey points including a first ascent of an important station. Members of the expedition not specifically named above, helped in many different ways in the various projects and were no less important for that. On August 7th, Keith Miller, and David Drewry had to leave on the start of their early journey home which in fact took them much longer than expected due to the non-arrival of an RAF flight.

The main party of the expedition commenced a lengthy packing up operation on 19th August, including carrying all the delicate instruments down the glacier for helicopter airlift to Mestersvig. A very large depot was left at Base Camp for next year's party, containing all the heavy and non-returnable equipment.

Final evacuation from the area had to be left as late as possible, pending the helicopter airlift of valuable equipment. However, the walk-out could be postponed no later than 29 August, and it was accomplished in three days in some very indifferent weather. The same poor weather eliminated all remaining chances of the helicopter flight taking place, and the equipment had therefore to be abandoned for the winter at the Cambridge Schuchert Expedition base camp site. This was, in a way, a major catastrophe, much of this equipment being on loan for the summer only.

All the Cambridge parties were thus reassembled in Mestersvig on September 1st, and again were shown great hospitality by the station members there. The charter flight back to Reykjavik, was delayed for a day by more bad weather, but took place uneventfully on September 5th and from Reykjavik the expedition members took their various ways home.

Members of the expedition:-

BARRON, P.A. (North Staffordshire Polytechnic and Pye Telecommunications Ltd.)
BURGESS, J.D. (C.U. Engineering Department and St. Catharine's)
CAMRASS, R.J. (C.U. Engineering Department and Clare)
DREWRY, D.J. (Scott Polar Research Institute and Emmanuel)
HANCOCK, M. (C.U. Engineering Department and Churchill)
MATTHEWS, D.W. (Geology Department and Peterhouse)
MACKEITH, P.L.C (Scott Polar Research Institute and Churchill)
MILLER, K.J. (C.U. Engineering Department and Trinity)
ROSE, K.E. (C.U. Engineering Department and Trinity)
THOROGOOD, J.L. (C.U. Engineering Department and Trinity)
WAY, A.R. (42 Survey Engineering Regt)
YAMINI, B. (C.U. Engineering Department and St. Catharine's)

APPENDIX

Several drawings are now attached to illustrate some of the work completed during the course of the expedition. Full details of the work will be given in Vol.II of the 1972 expedition report which will be published in July 1973.

FIG. 1. Location of Transverse Profiles taken across the surfaces of the Roslin and Dalmore glaciers.

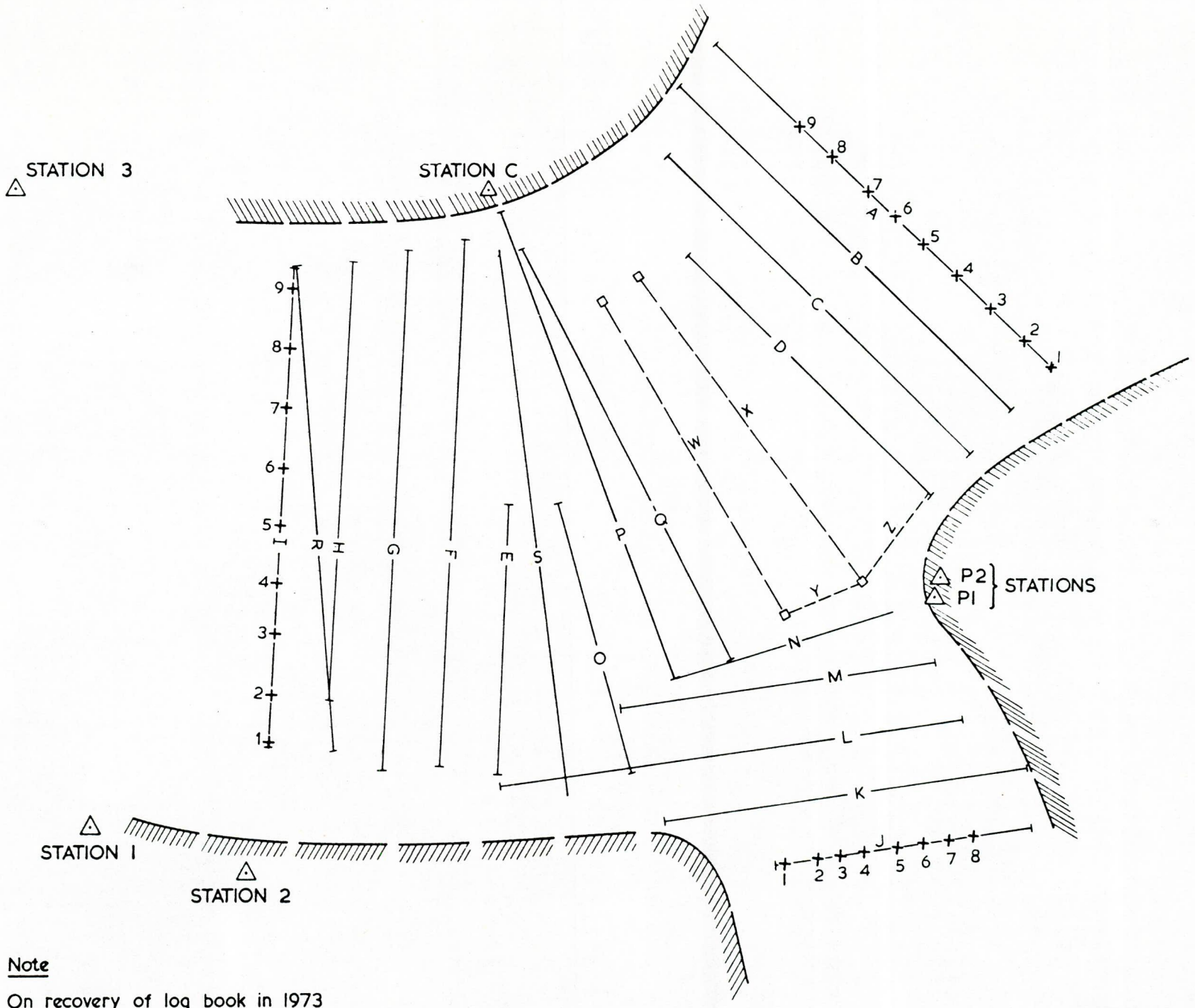
FIGS. 2-6. Transverse Profiles of the Surfaces of the Roslin and Dalmore glaciers.

FIG. 7. Glacier Surface contours and melt streams.

FIG. 8. Routes taken by the radio-echo sounding sledge.

FIG. 9. Ice-depth contours.

FIG. 10. True altitude contours of the glacier-rock bed interface.



Note

On recovery of log book in 1973

1. the terminal position of profiles N & S will be established
2. the location of profiles W, X, Y, Z will be established.

FIG. 1 LOCATION OF TRANSVERSE PROFILES : UPPER ROSLIN GLACIER

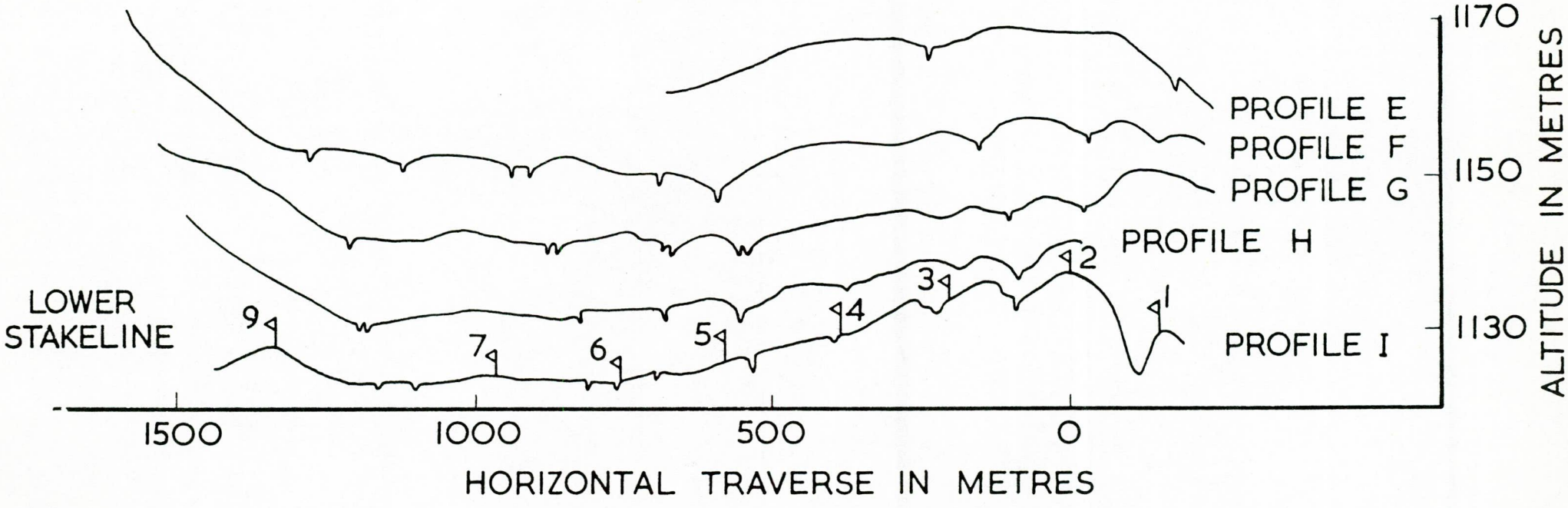


FIG. 2. TRANSVERSE PROFILES OF LOWER ROSLIN GLACIER

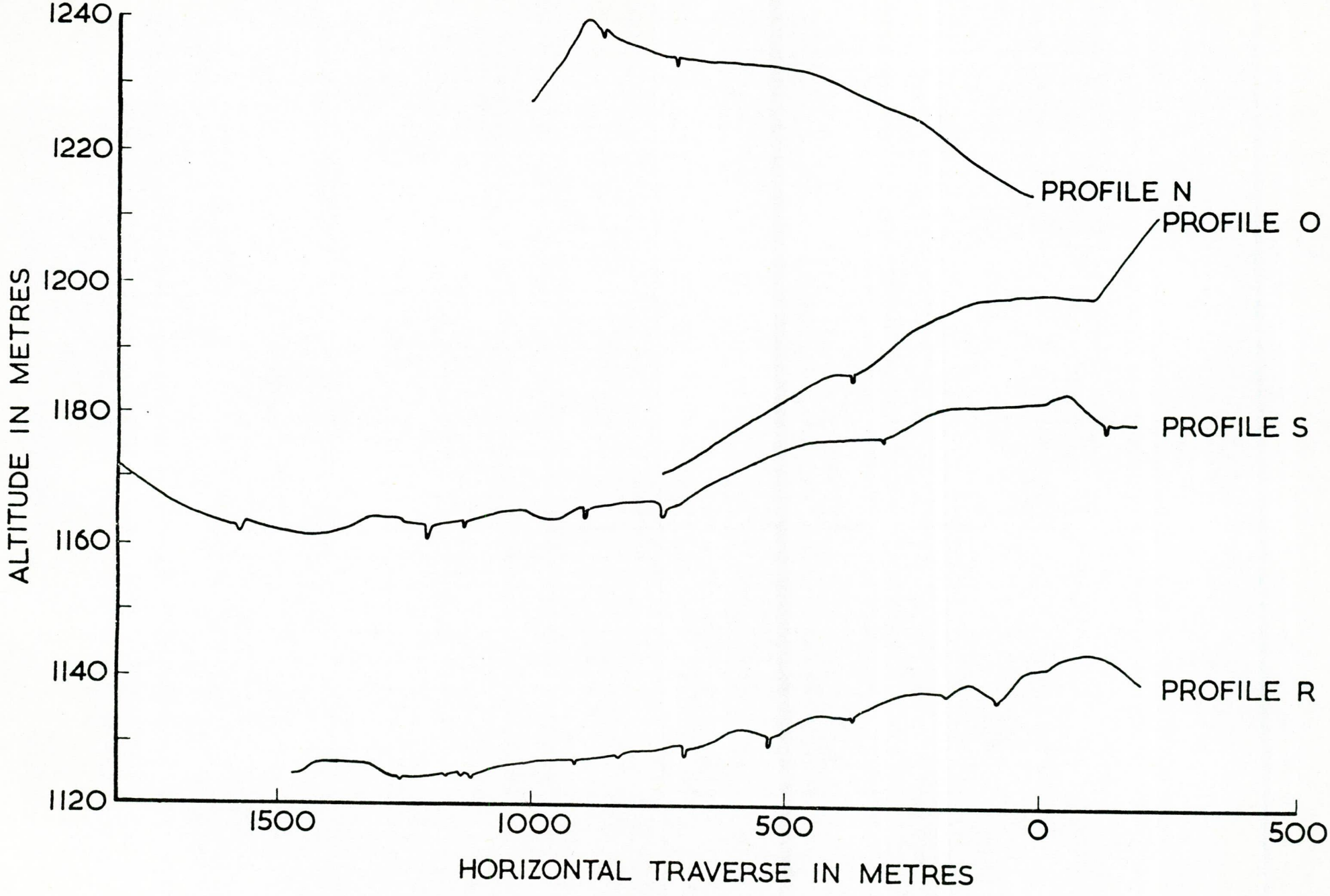


FIG. 3 TRANSVERSE PROFILES I

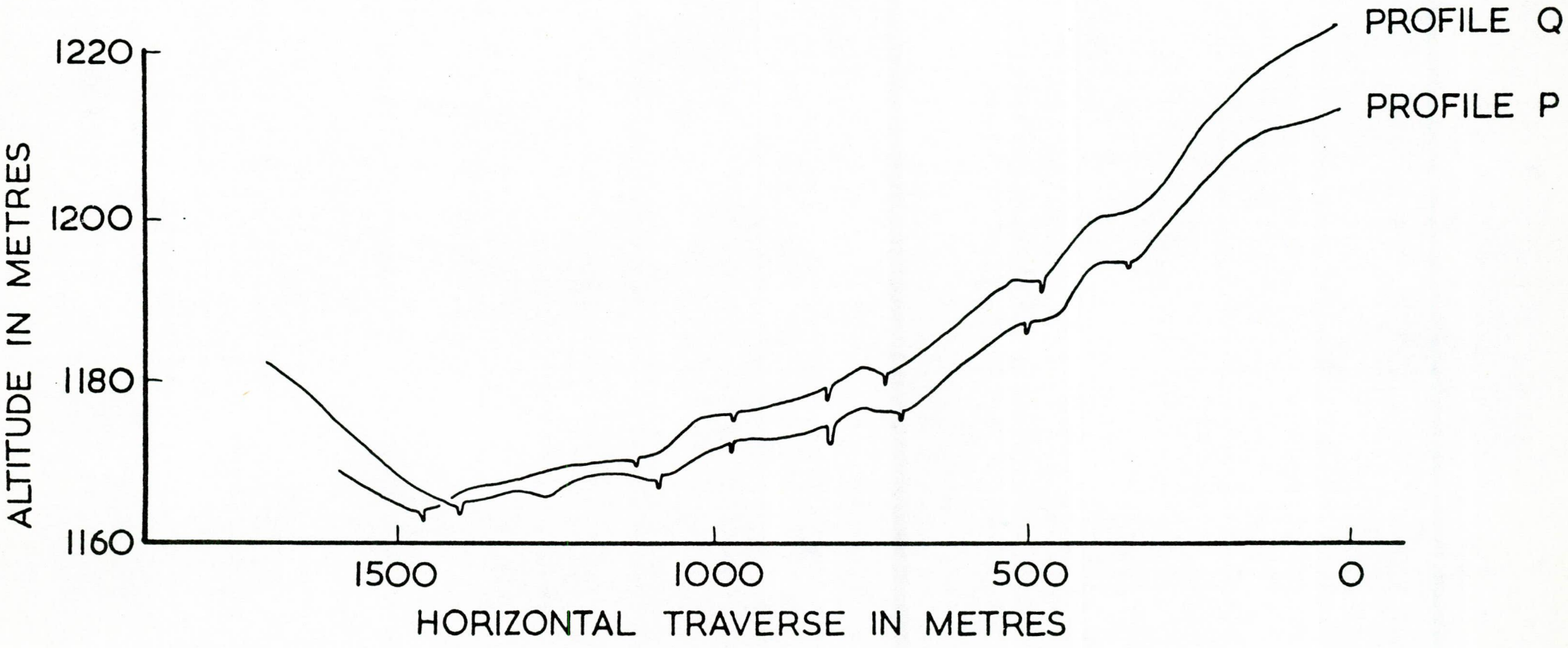


FIG. 4 TRANSVERSE PROFILES II

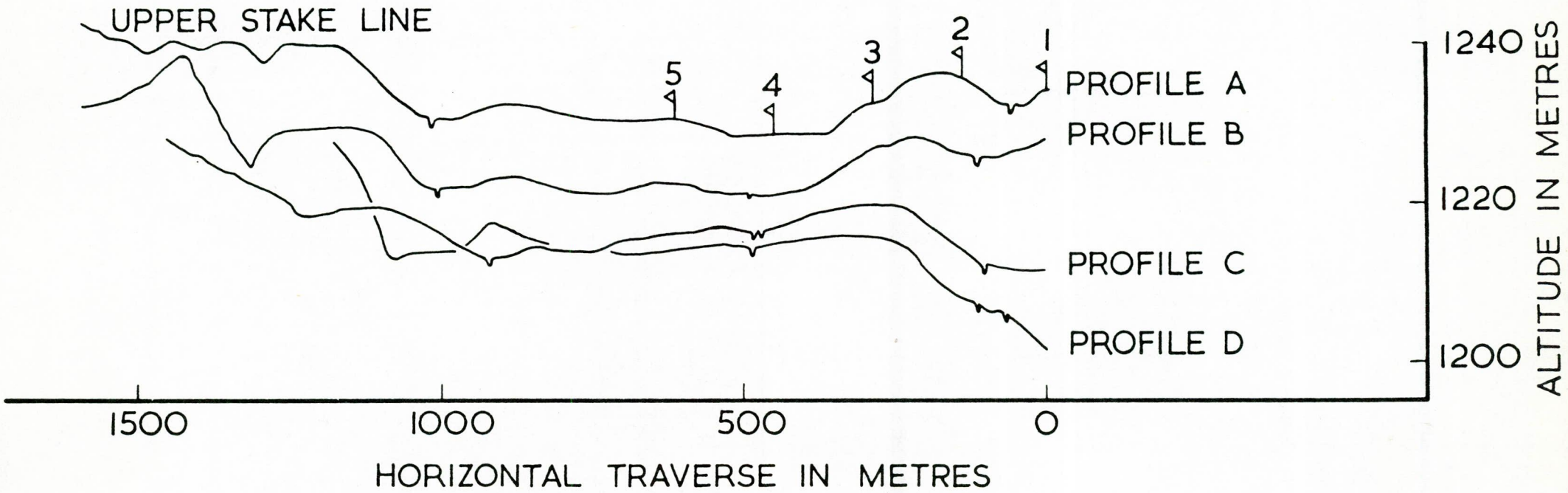


FIG. 5 TRANSVERSE PROFILES OF UPPER ROSLIN GLACIER

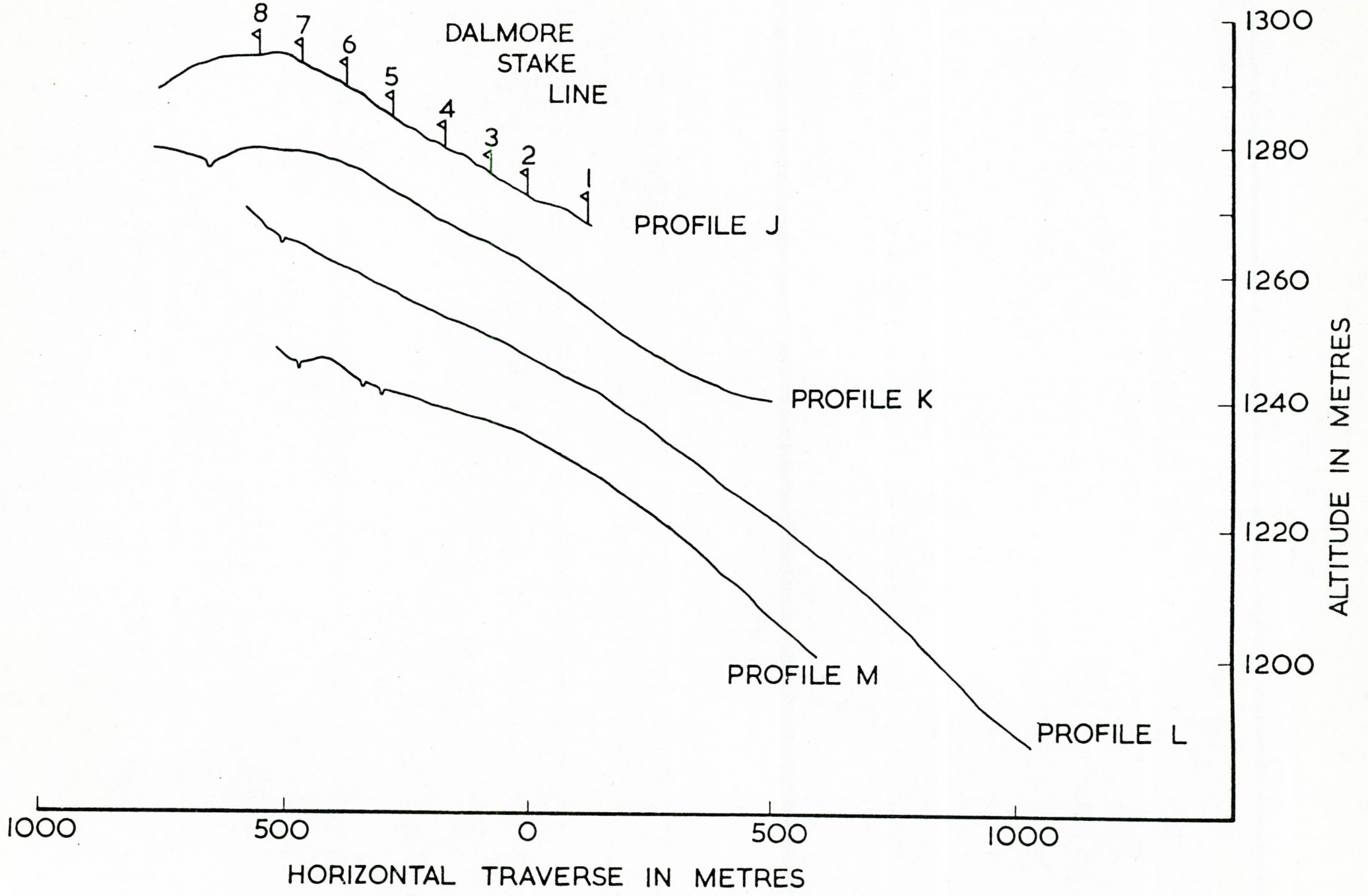
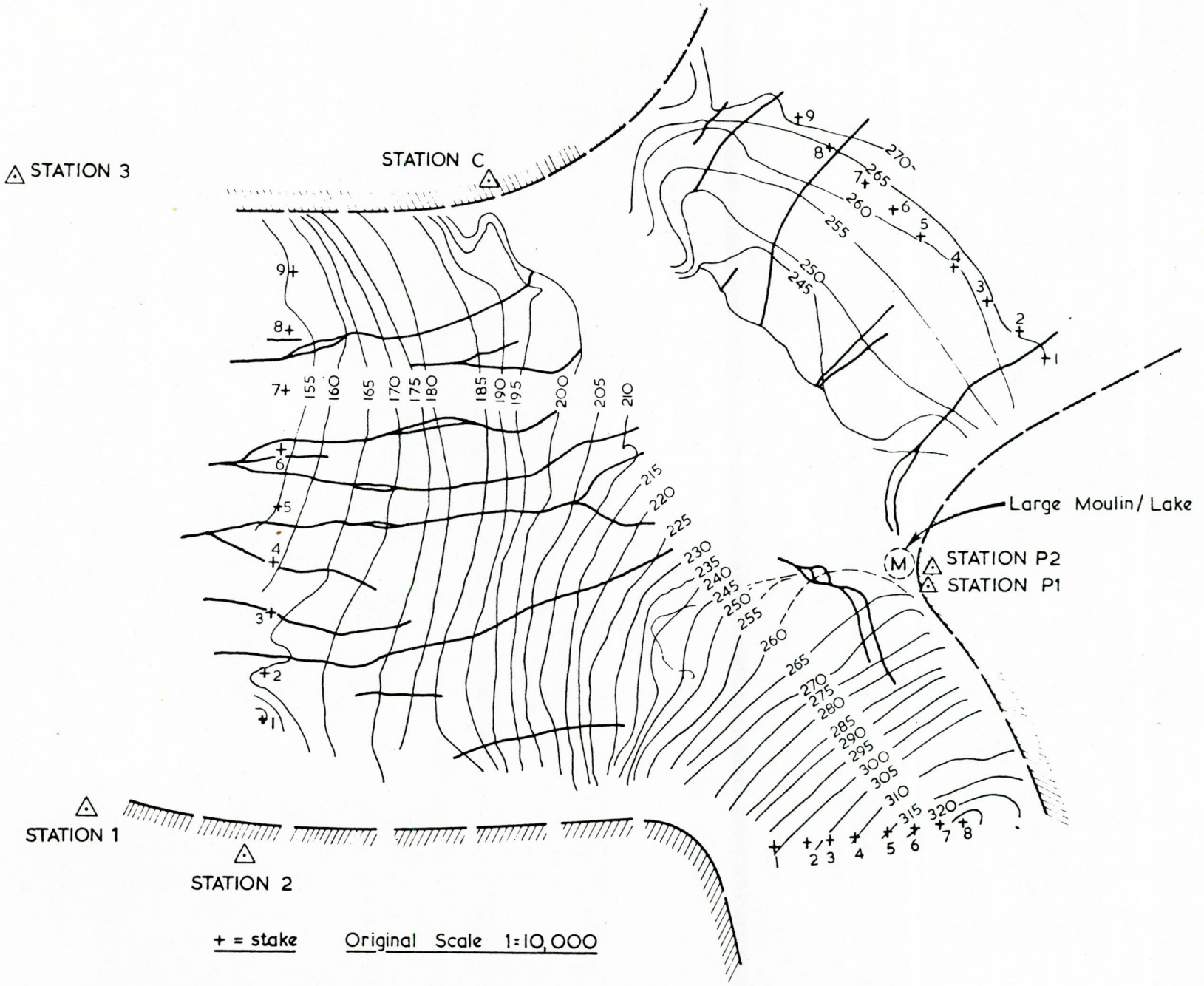
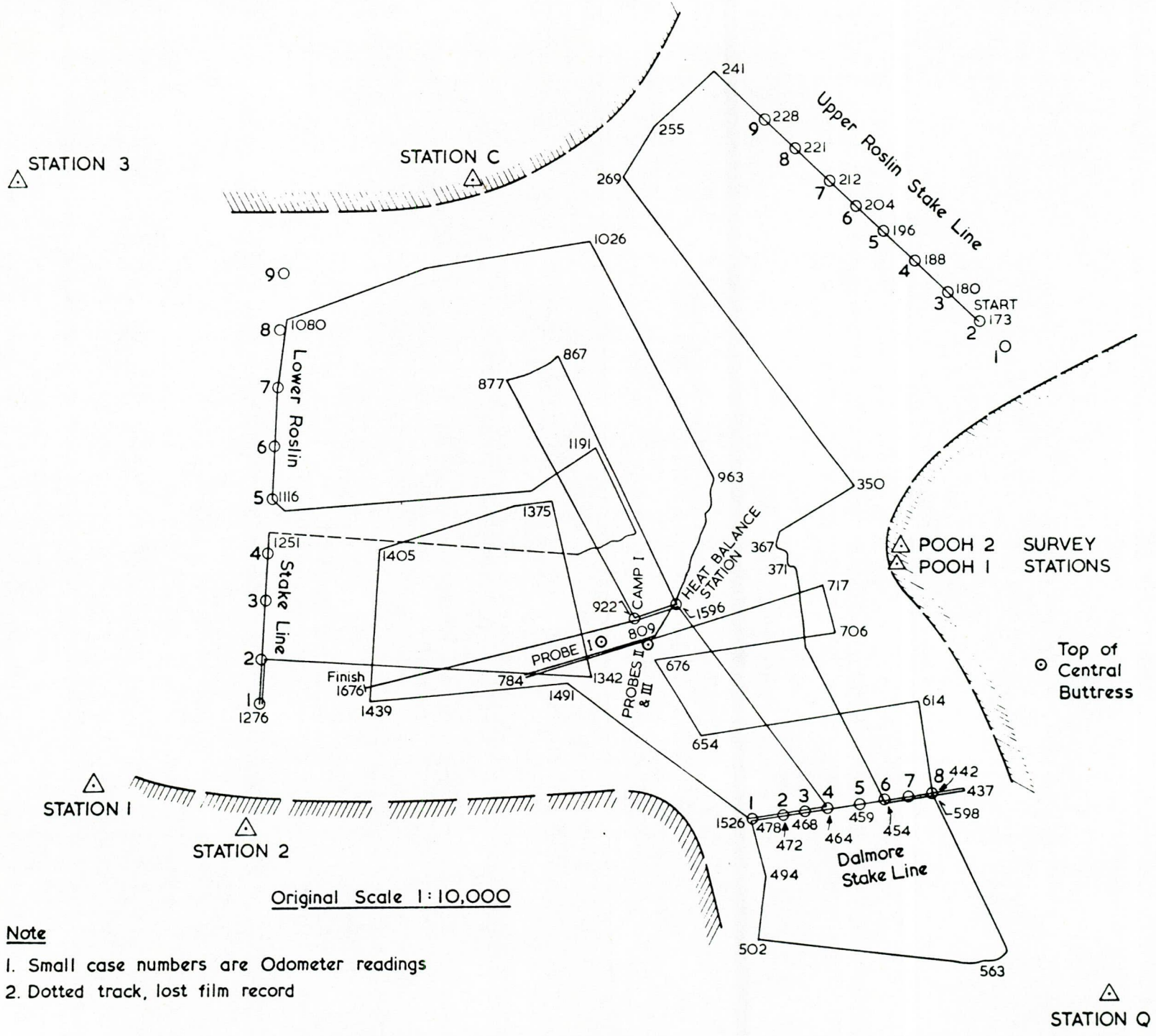


FIG. 6 TRANSVERSE PROFILES OF DALMORE GLACIER



Note. Zero height datum fixed at 200m below station 1

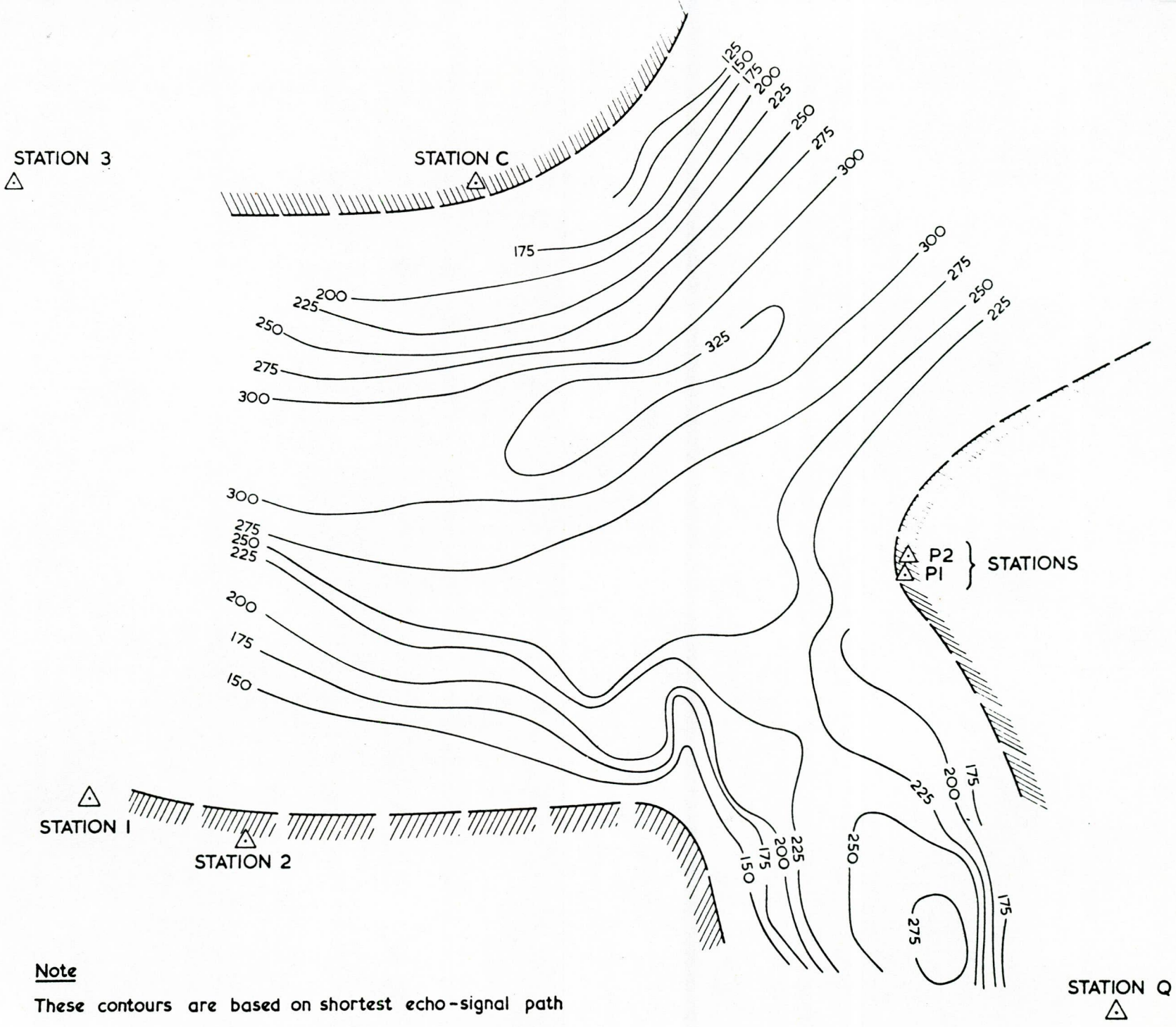
FIG. 7 GLACIER SURFACE CONTOURS AND MELT STREAMS



Note

1. Small case numbers are Odometer readings
2. Dotted track, lost film record

FIG. 8 RADIO ECHO SOUNDING SLEDGE ROUTES - AUGUST 1972



Note

These contours are based on shortest echo-signal path

FIG. 9 25m ICE DEPTH CONTOURS: UPPER ROSLIN GLACIER

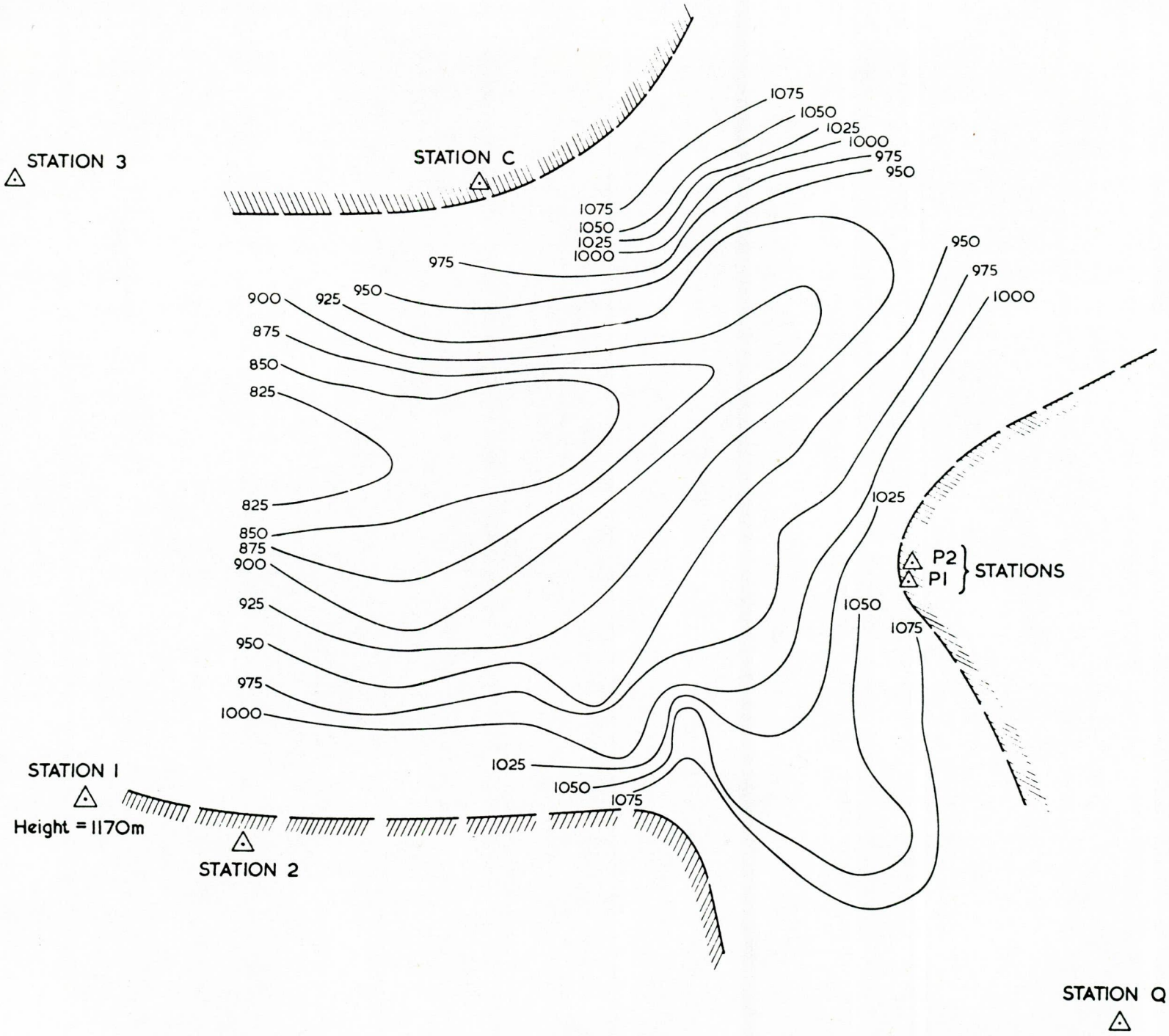


FIG. 10 25m ALTITUDE CONTOURS OF GLACIER BASE : UPPER ROSLIN GLACIER