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IGC ANTARCTIC GLACIOLOGICAL DATA
FIELD WORK 1959-60

Glaciology, Victoria Land Traverse, 1959-60

Report 968-1
Grant No. NSF-G8992

Alfred W. Stuart and Arnold J. Heine
Institute of Polar Studies

January 1961

PROJECT 968 Report No. 1

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2	34	though to be	thought to be
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Appendix I

Stratigraphic Data

Hardness

VH	Very Hard
H	Hard
M	Medium
S	Soft
VS	Very Soft
S-M	Soft to Medium

Grain Size

I	< 0.5 mm
II	0.5 - 1.0 mm
III	1.0 - 2.0 mm
IV	2.0 - 3.0 mm
V	> 3.0 mm

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Field Work 1959-60

GLACIOLOGY, VICTORIA LAND TRAVERSE, 1959-60

by

Alfred W. Stuart and Arnold J. Heine
Institute of Polar Studies

The Ohio State University
Research Foundation
Columbus 12, Ohio

Project 968, Report No. 1

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Abstract

The interpretation of 19 snow pits dug by the 1959-60 Victoria Land Traverse gives a mean annual accumulation of 16 cm of water equivalent for the area studied. Deposition is thought to occur in the form of sastrugi instead of in blanket form and this introduces a serious error in the interpretation. Approximate mean annual air temperatures ranged between -38.4°C and -47.4°C. A map of the traverse route shows contoured elevations and sastrugi observations. The highest elevation was 2591 meters. A compilation of accumulation stakes emplaced by this traverse is made available. The Rennick Glacier which empties into Rennick Bay and extends southward for about 300 kilometer was reconnoitered by the traverse party; a sketch map is included.

Accumulation stakes were measured on the Ross Ice Shelf, Skelton Glacier, and the Victoria Land Plateau near the coast of the Ross Sea. Annual values ranged from 23.5 cm to 1.7 cm of water equivalent; the higher accumulation is on the Ross Ice Shelf.

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GLACIOLOGY, VICTORIA LAND TRAVERSE, 1959-60

by

Alfred W. Stuart and Arnold J. Heine

INTRODUCTION

This is a report of the surficial glaciological work done by the personnel of the 1959-60 Victoria Land Traverse. The members of the party included three glaciologists, two seismologists, one surveyor, one psychologist, and one mechanic. Two of the glaciologists, Stuart and Heine, carried on the snow pit studies while the third, M. Lorius of France, did solar radiation and deuterium-isotope dating studies. His results will be published elsewhere. Mr. Heine was loaned to the traverse party by the New Zealand Antarctic Division. He was later granted leave of absence by the New Zealand Geological Survey to work at the Institute of Polar Studies, The Ohio State University, to assist in the preparation of this report.

The traverse left Scott Base on October 16, 1959 and covered 1520 miles in 118 days. The party was evacuated by air to NAF McMurdo on February 10, 1960, and the vehicles were cached for possible future use. The first 400 miles of the traverse route retraced the traverse of the previous year and no major work stations were made until leaving the old route. Fifteen movement and accumulation stations established by the previous traverse were reoccupied and remeasured. The movement stake results will be given in a later report. Once beyond the old route, 40 full work stations with three-meter pits were planned. However, as a result of delays caused by crevasses on the Skelton Glacier and by the very rough surface on the plateau, the schedule could not be met. In order to complete the planned route the stations were spaced about 50 miles apart and only 19 work stations were made.

The authors wish to thank the officers and men of Task Force 43 of the U.S. Navy without whose support this traverse would not have been possible. The authors also appreciate the criticisms and suggestions of their colleagues at the Institute of Polar Studies and Mr. A.P. Crary, Chief Scientist of the U.S. Antarctic Research Program.

OBSERVATIONS

At each work station a three-meter pit was dug in order to observe the snow stratigraphy. The stratigraphy was described and about 15

density measurements were taken per meter of depth. The principal face of the pit was photographed in transmitted light, and individual grains from selected layers were photographed in reflected light. Temperatures were measured with dial thermometers at 10-centimeter intervals for the first meter and every 25 centimeters thereafter. A ram sounding was made to a depth of three meters immediately behind the principal face of the pit.

In addition to the pit studies, the deep cores recovered by the seismologists in drilling their shot holes were measured and weighed for density determinations. At the bottom of these holes, usually 16 meters deep, a thermohm was placed and left overnight in order to measure the temperature at that depth which approximates the mean annual air temperature. The temperature values are given in Table 1. The size, form and orientation of the sastrugi were also observed and recorded. Between major work stations, rammsondes were taken to a depth of one meter at intervals of approximately six miles. Because of the extremely variable nature of the stratigraphy in Victoria Land, these rammsonde data are thought to be of limited value and are not reported here. The rammsonde data and the pit photographs are on file at the Institute of Polar Studies, The Ohio State University, 125 South Oval Drive, Columbus 10, Ohio

PIT STUDIES OF ACCUMULATION

Techniques

The observational techniques are essentially the same as those used by Wilson and Den Hartog on the 1958-59 Victoria Land Traverse (Ohio State University Research Foundation Report 825-2-Part II, July 1959 (pp. 2-4).

Definitions

In this report, the term "hoar" is used to designate layers in which the grains clearly exhibit the hexagonal crystal form. Where the layer has the same gross properties as one composed of hexagonal crystals but the crystal form is not clearly defined, the term "hoar-like" is used. The reason for the difference is not known, but both types are though to be sublimation products and are plotted as such on the stratigraphy sheets.

Thin layers of ice are referred to as "ice laminae" in this report and are identical to Den Hartog's "ice crust." Also, the term "crust" in this report is synonymous with Den Hartog's "white crust." These are

generally known as wind crusts. The ice laminae in Victoria Land were always less than 2 mm thick. Crusts were more variable and are classified as follows:

Thin - less than 5 mm thick

Medium - 5 mm to 1 cm thick

Thick - over 1 cm thick

The crusts and laminae were more or less level and continuous on all faces of the pit unless otherwise noted.

The photographs of the principal face of the pit came out well and were of material assistance in plotting up the stratigraphy and in analyzing the data.

Although both authors worked jointly on the reduction of data, the senior author analyzed the pit stratigraphy.

Analysis of Data

The interpretation of the firn stratigraphy in the Victoria Land Plateau is made difficult by the very irregular surface and by the excessive development of layers of sublimation crystals. The surface unevenness is due to the formation of closely spaced sastrugi, often over one meter high (Fig. 1). Sublimation products occur in layers up to 50 cm thick and as pockets and lenses, at all levels in the pits. Because of these difficulties the interpretations of these pits must be regarded as approximations only. The annual accumulation figures derived from these pits are given to the nearest 0.1 cm for convenience. Any pretense to such accuracy would be unrealistic. Table 2 is a compilation of these values. Mean values for each pit are given in Figures 2 and 3.

The analyses of these pits are based on ideas thoroughly discussed in works of Schytt (1958) and Benson (1959). The following procedures and assumptions were used in the derivation of annual layers from these pits:

(1) In the case of an ideal situation where a uniform, dense layer overlies a layer composed of sublimation crystals, the summer surface has been combined with the overlying firn up to the bottom of the next sublimation layer and used as one annual layer. In other words, the winter snow is combined with the sublimation layer below it in order to derive the accumulation for a single year. This is done because it has been observed in other places that the sublimation metamorphism does take place in the bottom of the winter snow.

(2) Where several sublimation layers are closely grouped (e.g., two within 10 cm) they are assumed to represent one summer and the summer surface is therefore placed at the bottom of the lower layer. It may well be that some of these do represent different summers but dual summer layering is more likely and is known to happen. The deuterium-isotope dating done by Lorius (personal communication) at B-61 indicates that this has happened twice within the upper 1.5 meters of the pit.

(3) In portions of five pits no interpretation could be made because of the excessive development of sublimation layers. An example of this is in Pit 504 where 5 sublimation layers occur between 74 and 122 cm and they make up 44 of the 48 cm in that span. It may be significant that this difficulty was confined to the area covered by the first half of the traverse route. Between Stations 502 and 527, portions of 5 of the 10 pits could not be interpreted for this reason whereas this problem was less serious in the 9 pits between B-61 and 559.

(4) The selection of annual layers, with a few exceptions, was not made in the field and this may be a source of error. This deficiency has been compensated partly by the use of the photographs of the pit wall. Their usefulness is shown by the fact that the stratigraphy between 121 and 200 cm in Pit 559 could be reconstructed from photographs after the description of the stratigraphy was lost.

The pit diagrams and stratigraphic data are given in Appendix I.

Discussion and Conclusions

The snow pits dug along the route of this traverse show an average annual accumulation of 16 cm water equivalent. Unfortunately, very few stake measurements are available for comparison. In 1959 the stakes near Station 72 (Plateau Depot) received accumulation at an annual rate of 10.8 cm of water equivalent and those at Station 84 received only 1.7 cm of water equivalent per year. However, neither of these localities is subject to Plateau conditions. Station 72 is on the edge of the mountainous region that flanks the Plateau and is very close to the névé of the Skelton Glacier. Station 84 is well inland but is in a 100-km-wide, wind-swept, north-south depression. The glazed surface and succession of closely spaced wind crusts in the stratigraphy attest to the windy conditions that prevail in this area.

The stake left by the French traverse at B-61 is in a representative location but it is only a single stake. Between 14 December 1958, and 23 December 1959, this stake records an accumulation of 9.1 cm of water equivalent. This is 5.5 cm less than the 8-year average derived from a nearby pit. One hundred miles to the north, at Charcot, the accumulation for two years (1957-59) was 14 cm of water equivalent per year (Lorius, 1960 a). Since the pit at B-61 showed only 6.5 cm for the most recent

annual layer, perhaps 1959 was a low accumulation year. The seven pits between Station 519 and Station 540 average only 8 cm of water equivalent for 1959. The results of deuterium-isotope dating done by Lorius (1960 b) support the higher figure derived from the pit at B-61. These results are compatible with those of the purely stratigraphic interpretation. The comparison of the results of the two methods is even better for the pits at Stations 507 and 516 (Lorius, personal communication).

A conceivable source of error in the stratigraphy is the possibility that the surface at a given point received no accumulation whatever during an accumulation year. Because the whole technique of stratigraphic interpretation is based on the assumption that there is some accumulation each year, lack of accumulation during one year at the point where the pit is dug would seriously affect the average. The possibility of this happening is suggested by the somewhat peculiar nature of the surface in Victoria Land. In many places there were areas where the surface was hard and polished, suggesting long exposure to wind action. Interrupting these glazed areas were large sastrugi, which were also hard, but were not polished or glazed. Furthermore, the glazed patches were often intersected by cracks several centimeters wide and at least 50 cm deep. (Figs. 4 and 5). Their pattern was irregular. Where the glazed surface was covered by a sastrugus, the crack continued under the sastrugus but the sastrugus itself was not cracked. The tracks of the previous year's traverse were visible in many places between Plateau Depot and Station 84. These tracks, at least ten months old, were on a hard, glazed surface and were covered in part by sastrugi.

This suggests that during a given accumulation period the entire net gain of snow assumes the form of sastrugi and the areas in between individual sastrugi remain bare. If these bare areas remained uncovered for as long as a year and then became buried, they would appear, in the stratigraphic column, as one summer surface, whereas in fact they represent two. Conversely, a sastrugus would contain a non-representative excess of snow for the area it covers. In other words, if one were to take the accumulation for a given area form a sastrugus the figure would be too high for that area while the value for the area adjacent to the sastrugus would be too low. The variability of four annual layers shown in Figure 4 suggests that some such process is at work. This variability is further suggested by the deviation of any single annual layer in any one of the nineteen pits from the accumulation mean of 16 cm of water equivalent. This approximate mean deviation of any single observation is ±6.3 cm.

It is possible to divide the traverse route into two parts for comparison: a southerly leg from Stations 502 through B-61, and a northerly leg from Stations 536 through 556. Station 559 is excluded here because it is not on the Plateau. Differences in elevation, accumulation, and temperature on each leg are given in the following table.

	Average Elevation (meters)	Mean Annual Accumulation	Mean Annual Air Temperature
Southerly leg:	2489	14 cm water	-46°C.
Northerly leg:	2285	18 cm water	-41°C.

It should be emphasized that the accumulation figures derived from these pits are only approximate. The interpretations given here are those which appear best to the senior author. Other possible interpretations would increase or decrease the final accumulation figures accordingly.

ACCUMULATION STAKES IN VICTORIA LAND

Measurement of Accumulation Stakes

The 1958-59 Victoria Land Traverse placed accumulation stakes at various points on the Ross Ice Shelf, Skelton Glacier, and the Victoria Land Plateau. All of these stations were reoccupied by the 1959-60 traverse. The accumulation figures are given in Table 3, and the stations are shown on Plate 1.

In addition to the above groups of stakes, a line of accumulation stakes was emplaced from a point near Station 88 to Scott Base. The stakes were spaced about one mile apart, but the readings were not continuous because some stakes were lost and part of the trail was through a crevassed region, parts of which were by-passed when the remeasurements were made. The results of these measurements are given in Figure 7. The three groupings are on the basis of elevations derived from altimetry readings. The location of these groups is shown in Figure 8.

The stakes which were remeasured twice show that 80% of the accumulation occurred during the first 60% of the 13-month period, that is, during the winter. In group II, eleven stakes were remeasured in September, while only four of these were remeasured in February. These four stakes gained 33% more accumulation between the two periods of remeasurement, so this amount has been added to the other seven in order to derive the annual accumulation. These adjusted amounts are used in Figure 7 for the annual accumulation in water equivalent for Group II.

Densities were not measured at the time of stake remeasurement. However, data from pits in this area show that the density of the top 0.5 meter averages 0.35 gm/cm^3, so this figure has been used to derive water equivalents. Densities for the other stations on the Ice Shelf and on the Skelton Glacier are also derived from previous pits. On the Plateau the density of the accumulation was measured at the time of remeasurement.

Accumulation Stakes Emplaced by the Victoria Land Traverse 1959-60

Many stake measurements will be needed before the annual accumulation in Victoria Land is known to any degree of accuracy. Realizing this, the glaciologists of this traverse put accumulation stakes at a number of strategic points in the hope that some of them will be remeasured within the next few years. Thus, the location of these stakes and other pertinent information is given.

Station 515 3 December 1959 74° 34.10'S, 144° 23.90'E

Six tall bamboo poles were placed in a line running west from the depot left at this station. All were notched at a height of two meters above the snow surface.

Station B-61 (531) 25 December 1959 71° 07.80'S, 139° 11.27'E

At this station eleven bamboo poles were emplaced and, in addition, two wires were laid out flush with the surface and secured to two pairs of poles. Each wire will indicate the accumulation above a horizontal line about 10 meters in length. The center of the L-shaped line of stakes is about 100 meters east of the red metal pole which marks the station site.

	Height above surface	Pole marked at
South line	3.04 meters	2.0 meters
	1.30	1.0
	3.15	2.0
	2.30	2.0
	1.55	1.0
Center stake	2.80	2.0
East line	1.47	1.0
	1.60	1.0
	2.95	2.0
	1.40	1.0
	3.24	2.0

A black wire was stretched between the center stake and the adjacent one on the southern line. A red wire was stretched between the center stake and the adjacent one on the eastern line.

Station 544 14 January 1960 72° 07.81'S, 148° 12.08'E

The Snocat and sled were abandoned here. Six short bamboo poles with flags were put on a southerly line from the Snocat. Their heights

above the snow surface are:

0.80 meters (nearest Snocat)
0.82 "
0.82 "
1.07 "
1.44 "
0.87 " (farthest from Snocat)

A note containing these heights was placed in a bottle and attached to the steering wheel of the vehicle.

Station 558 4 February 1960 72° 15'08"S, 160° 08'11"E

Four flags used in surveying were left here, but only two were marked for accumulation. Those two are each about one mile from the main station as marked by a 50-gallon gasoline drum. One pole has an azimuth of 155° 17' from the drum and is marked at one meter. The other has an azimuth of 336° 21' from the drum and is cut at two meters. The above azimuths are clockwise from south.

558 to 559

Small flags were left on the trail between these stations and measured for recording accumulation.

Station	Statute miles from 558	Course heading to next station	Height of pole above snow surface
558A	6.1	122° true (North=0)	132 cm
558B	11.5	122	76
558C	16.9	122	61
558D	21.7	122	--
558E	27.6	122	73
558F	32.7	185	57
558G	38.5	152	74
559	42.7	---	--

Station 559 6 February 1960 72° 37'48"S, 161° 32'08"E

At this, the final station, 24 bamboo poles were emplaced. Only the total length of each pole was measured. The corner of this L-shaped line is near the cached Snocats. One leg contains 18 poles and runs northeast, the other, six poles and runs northwest.

Height of top of pole above snow surface in centimeters:

NE line		NW line	
332	Next to center	99	Next to center
85		93	
123		139	
76		101	
141		172	
79		155	
93			
87			
105			
75			
93			
175			
84			
81			
106			
101			
104			
329			

PHYSICAL FEATURES OF VICTORIA LAND

The physical features of Victoria Land are plotted on Plate 1. This map is based on the one prepared by the American Geographical Society for the National Academy of Sciences as revised in December 1959.

All elevations and positions (other than on traverse route) are from the American Geographical Society map. Sastrugi information for the 1958-59 Victoria Land traverse is taken from data on file at the Institute of Polar Studies. Other data are from published sources as noted.

The crevasses shown near the apex of the traverse route were seen between 141° and 142°E at about 71° 40'S by a Navy resupply flight on December 24, 1959. The crevasses were described as "rifts" several hundred feet wide with sheer walls, had a southerly orientation, and disappeared somewhere between the discovery point and the trail of the traverse. This information was received by the traverse party via a radio message from NAF McMurdo on December 26, 1959. Therefore, the traverse by-passed this area and the crevasses were not seen by members of the party. Since these crevasses probably indicate near-surface rock masses, it is interesting to note that Bage and his party (Mawson, 1942) encountered crevasses up to 40 feet wide, at about 68° 50'S, 144° 00'E, which extended from that point southwest at least to the horizon. Such an orientation puts them in line with the ones seen near 71° 40'S.

The map shows several irregularities in the ice cap topography which appear to be related to the accumulation. One is the depression between Station 72 (Plateau Depot) and Station 84. The elevations of both Victoria Land traverse and of the British Trans-Antarctic Expedition indicate that south of the two stations this depression is in the form of a trough which is oriented north-south. Elevations to the north do not confirm this shape but they are not considered reliable enough to be conclusive.

Thirty-three stakes left at Station 84 by the previous traverse recorded accumulation at an annual rate of only 1.7 cm of water. A 50-cm pit dug near one of these stakes indicated a sequence consisting of depth hoar or other low density snow alternating with thin to thick wind crusts. The thickest layer is only 9 cm. These facts imply that this area is swept by frequent dry winds, probably originating from the south because the regional elevations increase in that direction, and the sastrugi show a surface wind direction slightly west of south.

The spot elevations immediately north of the traverse track between Station 72 and 84 indicate that the depression ends near here and the surface rises as it approaches the eastern mountains. In this case the precipitation would be expected to increase in this higher area because the dry winds are cooled as they ascend this slope and their water-carrying capacity is reduced accordingly. Vickers (1958) does report relatively high accumulation values (17 and 15 cm of water/year) from his two pits in this possibly higher area.

The second topographic feature is a large indentation in the north coast east of Dumont d'Urville (66° 40'S, 140° 01'E). The axis of this depression is slightly east of south. The elevations which are in the center of this depression were measured by Bage in 1912 with a hypsometer. The elevations derived from this instrument appear to have been used without correction for variations in barometric pressure so their accuracy could be no better than ±50 meters and possibly less. However, the contours drawn using Bage's elevations and those from the French traverse of 1958-59 parallel the contours drawn between those same French elevations and the elevations of the 1959-60 Victoria Land traverse which were corrected for changes in barometric pressure and temperature. Therefore, while the exact size and direction of this feature is undetermined, there can be little doubt that it exists in approximately the size and form as shown. The map indicates that the 1959-60 traverse crossed the southern tip of this feature, and, indeed, in this very area the members of the party noticed that they had descended into an obvious depression of some size. To the east from this point the surface appears flat, and, as the elevations show, the surface rises very slowly to the mountainous area at 160° E.

Coincident with this depression was a dramatic change in the nature of the snow surface. As the traverse proceeded east from this point the surface changed within a few miles from rough to relatively good for

travelling. For the previous 700 miles the traverse had been plagued by high, hard, and closely spaced sastrugi. This rough surface quickly gave way to a surface composed of small, still hard, but more scattered sastrugi. The more significant difference in the two surface types is that in the rough areas the major sastrugi system was very dominant and only occasional small minor systems were noted. In contrast, the smoother surface was composed of sastrugi of several axes and the major system was not overwhelmingly dominant. The surface from the point of change until the end of the traverse was of this smoother type.

The pits indicate that the accumulation in the area of the smoother surface is only about ten percent higher than in the area of rough surface, so this is discounted as an explanation of the difference in the surfaces. A more likely explanation lies in the relative constancy of the surface wind direction. When the wind is from a more or less constant direction a sastrugus can grow slowly, as all accumulation subsequent to its initial formation will be an addition to it. On the other hand, in areas of smaller sastrugi, the wind direction is shifting, thereby building new forms with different orientations than the original ones.

The large, closely-spaced sastrugi, characteristic of the rough surface, not only show a preferred orientation but they also are located on the northeastern slope of the large dome in East Antarctica. The smaller, less concentrated sastrugi, characteristic of the smooth surface, however, have more random axes and are on a 150-200 km-wide bench in the plateau surface. This bench slopes very gently but in opposition to the slope of the dome. The winds which blow off this dome may well lose much of their force and preferred orientation as they spread out over this broad, nearly flat step and then flow into the mountainuous areas west of 160° E.

The sastrugi directions along the route of the 1958-59 Victoria Land traverse were measured with a magnetic compass (directions were corrected for declination).

RECONNAISSANCE OF RENNICK BAY AREA

While the Victoria Land Traverse was near 140° E, a U.S. Navy plane made a resupply flight to it on December 24, 1959; its course was a line from Hallett Station (72° 18'S, 170° 18'E) to the traverse. This flight discovered that the Admiralty Range extends as far west as 160° E. Therefore, in preparation for the traverse's entrance into the region, on February 2, 1960 a Navy aircraft of Squadron VX-6 flew a reconnaissance of part of the area in a successful attempt to locate a point from which the traverse party could be evacuated by air. The area chosen was in a large valley whose surface was several thousand feet below that of the plateau from which the traverse was descending. This valley was so large

that an attempt to determine its extent was made immediately. Unfortunately, visibility to the North of the traverse, then at 72° 15'S, 160° 08'E, was poor, so the aircraft was forced to turn back. On February 7 the traverse party descended into the valley and reached the pick-up point at 72° 37'S, 161° 32'E. On February 10 the plane returned and evacuated the traverse. Before returning to NAF McMurdo, the R4D-8 aircraft, piloted by Lt. Cmdr. Dale and Lt. (jg) Weeks, flew north to about 161° E and 70° S, the approximate position of Rennick Bay. During the course of the flight, oblique aerial photographs were taken at regular intervals from both sides of the plane. The position, elevation, and altitude of the plane at the time of each exposure was noted. During the flight the author observed the terrain from the cockpit. For the sake of convenience the glacier described is called the Rennick Glacier, although this is not an approved place name. Figure 9 is a map of the area.

Near the pick-up point, the mountains to the west consist of small block-shaped nunataks and a few, larger flat-topped mountains. To the east and southeast, the exposed rock masses are in the form of large mountains and long, flat ridges. A striking feature of these eastern mountains are several very thick, dark, horizontal bands which can be followed by the eye from one nunatak to the next. That this rock is more resistant to mechanical wheathering than the rock above and below it is exhibited in a number of places where it forms a flat cap on otherwise sharp pinnacles. Farther north this banding is not apparent, and the mountains are almost completely snow-covered. North of about 72° S, the eastern mountains form long chains, extending to the coast. Similar mountains flank the western side of the glacier, north of about 71° 30'S.

The glacier extends from the pick-up point north to the seaward edge of Rennick Bay, a distance of about 150 nautical miles. The glacier extends another 10-30 miles south of the end point of the traverse, so its total length is 160-180 nautical miles in a north-south direction. The maximum elevation of the glacier surface would not be much over 1,700 meters, while that of the plateau to the west is at least 2,000 meters.

The Rennick Glacier consists of an upper and lower component. The upper component is flat and relatively free from crevasses. Ice streams or valley glaciers feed directly from the plateau into it. The demarcation between the two components is at a group of nunataks about halfway down its length. These nunataks divide the glacier into two streams which rejoin beyond them. At the nunataks there is a steep scarp, the surface elevation dropping from 1,700 meters to near sea-level within a few miles. Northward from this scarp, the ice appears to be in the form of an ice shelf, judging by its flatness and low elevation. Northward of the small island at 70° 25'S, evidence of a past breakout of this ice can be seen. Numerous small icebergs are frozen in, and at one point the calving can be reconstructed like a jig-saw puzzle because the broken pieces moved only a short distance before the water refroze. Open sea water was not seen, but the aircraft radar seemed to indicate its existence about 20 miles north of the small island mentioned above.

A source of nourishment for the Rennick Glacier is not hard to imagine. Not only is it directly connected to the main ice cap to the west, but also large valley glaciers empty into it from the eastern mountains. When the traverse party was in the area, the surface was covered by about 20 cm of soft snow, in dramatic contrast to the hard sastrugi that covered the surface of the plateau. This suggests that the accumulation on the Rennick Glacier is considerably higher than on the plateau, and this accumulation is probably a large portion of the nourishment of the glacier. The pit at Station 559, the evacuation point, indicates an average annual accumulation of 16 cm of water. Areas of blue ice were seen only close to nunataks.

In conclusion, it should be emphasized that this reconnaissance report, and especially the accompanying map (Figure 9) are based on only two necessarily brief flights and oblique photos for which little control is available. The intention is to describe in the most general terms possible a first order feature previously uncharted.

CORE DENSITIES

The cores from the seismological shot holes were trimmed, measured and weighed. When the total length of untrimmed core pieces did not agree with the known shot-hole depth, a proportionate correction was added to the length of each untrimmed core piece.

Core diameters were not measured. Reduction of data from the 58/59 Victoria Land Traverse has shown (Crary, unpublished memorandum) that although small variations were measured in core diameters the following average diameters could be assumed:

0 - 10 meters	7.45 cm
10 - 15 "	7.50 cm
15 - 20 "	7.55 cm

Densities were calculated by the following method:

$$\text{density} = \frac{\text{weight x K}}{\text{length}}$$

$$\text{in which K} = \frac{\text{density x length}}{\text{weight}}$$

K = 0.2292 when core diameter is 7.45 cm
K = 0.2264 when core diameter is 7.50 cm
K = 0.2236 when core diameter is 7.55 cm

These values of K were derived by first determining the densities in the usual manner (density = $\frac{\text{weight}}{\text{volume}}$) for a few pieces. Calculations based on each method gives identical results.

Difficulty in trimming core sections accurately and variations inherent in the type of balance used limit the accuracy of the density figures to 0.01 gm/cm^3.

The core densities are tabulated in Appendix II. Mean density values are given in Table 5.

Table 1. Mean annual air temperatures

The following temperatures were measured at depths greater than ten meters and therefore are very close to the mean annual air temperature at each location. The thermohm was left in the drill hole at least three hours and usually over-night.

Station	Depth (meters)	Temperature °C
510	12	-47.2
512	16	-47.4
521	10	-46.5
524	14	-44.0
527	17	-44.2
540	16	-42.3
544	16	-41.5
548	16	-41.0
550	16	-40.9
553	16	-39.6
556	16	-38.4
559	13	-30.6

Table 2. Accumulation from snow pits

Station	Date of Annual Layer	Depth (cm)	Thickness (cm)	Density (g/cm^3)	Water Equivalent	Average Water Equivalent
502	1959	0-45	45	.399	17.6	13.9
	1958	45-73	28	.364	10.2	
504	1959	0.40.5	40.5	.401	16.2	16.2
507	1959	0-11	11	.401	4.4	7.1
	1958	11-31	20	.395	7.9	
	1957	31-53	22	.403	8.9	
510	1959	0-15	15	.394	5.9	13.2
	1958	15-58.5	43.5	.405	17.6	
		91-136	45	.432	19.4	
		174-218	44	.384	16.9	
		218-254	36	.393	14.1	
		254-280	26	.401	10.4	
		280-300	20	.396	7.9	
512	1959	0-20	20	.354	7.1	10.1
	1958	20-36	16	.390	6.2	
	1957	36-79	43	.397	17.1	
516	1959	0-59	59	.403	23.8	20.5
	1958	59-109	50	.451	22.6	
	1957	109-187	78	.377	29.4	
	1956	187-240	53	.438	23.2	
	1955	240-270	30	.388	11.6	
	1954	270-300+	30+	.409	12.3	
519	1959	0-22	22	.398	8.8	14.8
	1958	22-43	21	.394	8.3	
	1957	43-107	64	.406	26.0	
	1956	107-152	45	.387	17.4	
	1955	152-187	35	.446	15.6	
	1954	187-209	22	.397	8.7	
	1953	209-253	44	.420	18.5	
	1952	253-290	37	.414	15.3	
521	1959	0-18	18	.354	6.4	11.7
	1958	18-43	25	.387	9.7	
	1957	43-72	29	.415	12.0	
	1956	72-91	19	.389	7.4	
	1955	91-122	31	.393	12.3	
	1954	122-175	53	.387	20.5	
	1953	175-191	16	.404	6.5	
	1952	191-237	46	.423	19.5	
	1951	237-267	30	.377	11.3	

524	1959	0-30	30	.390	11.7	17.1
	1958	30-78	48	.377	18.1	
	1957	78-93	15	.436	6.5	
	1956	93-128	35	.393	13.8	
	1955	128-186	58	.407	23.6	
	1954	186-252	66	.435	28.7	
527	1959	0-30	30	.423	12.7	14.6
	1958	30-45	15	.399	6.0	
	1957	45-135	90	.410	36.9	
	1956	135-171	36	.448	16.1	
	1955	171-189	18	.453	8.2	
	1954	189-238	49	.435	21.3	
	1953	238-269	31	.417	12.9	
	1952	269-286	17	.418	7.1	
	1951	286-311	25	.422	10.6	
B-61 (531)	1959	0-16	16	401	6.4	14.8
	1958	16-53	37	364	13.5	
	1957	53-83	30	366	11.0	
	1956	83-103	20	382	7.6	
	1955	103-149	46	420	19.3	
	1954	149-207	58	403	23.4	
	1953	207-244	37	451	16.7	
	1952	244-292	48	428	20.5	
536	1959	0-22	22	.389	8.6	17.8
	1958	22-39	17	.419	7.1	
	1957	39-79	40	.404	16.2	
	1956	79-134	55	.415	22.8	
	1955	134-181	47	.413	19.4	
	1954	181-263	82	.398	32.6	
540	1959	0-19	19	.403	7.7	20.7
	1958	19-79	60	.395	23.7	
	1957	79-106	27	.461	12.5	
	1956	106-172	66	.440	29.0	
	1955	172-234	62	.435	27.0	
	1954	234-288	54	.446	24.1	
544	1959	0-42	42	.430	18.1	18.3
	1958	42-56	14	.456	6.4	
	1957	56-103	47	.394	18.5	
	1956	103-163	60	.408	24.5	
	1955	163-185	22	.423	9.3	
	1954	185-222	37	.436	16.1	
	1953	222-305	83	.428	35.5	

548	1959	0-34	34	.435	14.8	19.3
	1958	34-60	26	.386	10.0	
	1957	60-76	16	.405	6.5	
	1956	76-144	68	.412	28.0	
	1955	144-210	66	.395	26.1	
	1954	210-255	45	.434	19.5	
	1953	255-325	70	.454	31.8	
550	1959	0-18	18	.419	7.5	19.3
	1958	18-101	83	.394	32.7	
	1957	101-141	40	.416	16.6	
	1956	141-202	61	.409	24.9	
	1955	202-240	38	.384	14.6	
	1954	240-288	48	.404	19.4	
553	1959	0-31	31	.393	12.2	17.8
	1958	31-68	37	.366	13.5	
	1957	68-94	26	.374	9.7	
	1956	94-136	42	.373	15.7	
	1955	136-184	48	.379	18.2	
	1954	184-261	77	.420	32.3	
	1953	261-315	54	.428	23.1	
556	1959	0-47	47	.401	18.8	15.1
	1958	47-98	51	.371	18.9	
	1957	98-139	41	.399	16.4	
	1956	139-162	23	.396	9.1	
	1955	162-187	25	.358	9.0	
	1954	187-205	18	.413	7.4	
	1953	205-240	35	.430	15.1	
	1952	240-300	60	.430	25.8	
559	1959	0-20	20	.353	7.1	16.3
	1958	20-43	23	.399	9.2	
	1957	43-94	51	.438	22.3	
	1956	94-135	41	.417	17.1	
	1955	135-192	57	.450	25.6	

Probable error of the arithmetical mean for a single observation = ±5.3 cm

Mean Accumulation Values (cm water)

Stations 502 - 531 (B61) = 14.3
Stations 536 - 559 = 18.0

Total = 16.0

Table 3. Snow accumulation measured by stakes by 1959-60 Victoria Land Traverse

Station	Period of Accumulation	Accumulation (snow)	No. of Stakes	Density (g/cm^3)	Water (cm)	Yearly Rate (cm water)
86 (R)	27/1/57-17/10/59	30.1	12	.42	12.6	17.6
57 (R)	25/1/59-20/10/59	37.0	3	.38		19.2
59 (R)	24/1/59/-24/10/59	50.0	14	.35	17.5	23.5
61 (S)	several	-	15	.40	-	7.7
66 (S)	26/11/58-3/11/59	41.5	2	.35	14.5	15.5
72 (V)	17/12/58-10/11/59	28.7	22	.338	9.7	10.8
84 (V)	14/1/59-12/11/59	5.0	33	.275	1.4	1.7
B-61 (V)	14/12/58-23/12/59	24.0	1	.381	9.1	9.0

(R) on Ross Ice Shelf

(S) on Skelton Glacier

(V) on Victoria Land Plateau

For location of stations, see Plate 1.

Table 4. Sastrugi Measurements

The field observations were made by C. Lorius. The wind directions are given in degrees true ± 5 degrees. All sastrugi recorded are linear. [+]Pockmarked sastrugi, [++]Undercut sastrugi.

Station Number		502	504	507	510	512	515	519	521	524	527	531	536	540	544	548	550	553
Major Wind Axis		220	240	235	210	210	200	170	180	180	185	175	190	170	170	180	155	135
Dimensions of largest sastrugi in area	(length,m)	1-5	4	5	3	3	5	3	7	10	6	4	5	4	4	5	4	8
	(width,m)	.4-2		1	.5	.8	1	.7	1.5	2.5	.7	.7	.8	1.5	1	1.5	1.5	2
	(height,m)	.40	.25	.40	.30	.30	.35	.30	.40	.90	.60	.25	.40	.60	.50	.25	.15	.25
Number of forms per 10m x 10m		4	4	8	4		9	5	8	13	3	5	6	11	8	7	4	4
Average distance between center of forms, (m)		3	4	2	5	5	3	3	1	1	5	3	3	3	1.5	7	4	3
Density of sastrugi (gms/cm^3)		.458	.384	.42	.344	.338	.308	.410	.364	.368	.344	.456	.404	.424		.440	.428	.360
Minor Wind Axis				215			260				220		165	155	140	145	140	170
Dimensions of largest sastrugi of this axis	(length,m)			4			3				2		3	2	3	4	3	2
	(width,m)			.5			.7				.2		.5	1	.8	.8	.8	1
Minor Wind Axis																120	125	195
Dimensions of largest sastrugi of this axis	(length,m)															2	2	1
	(width,m)															.4		.5

Table 5. Mean firn densities

Station No.	3-10 m	10-15 m
512	.44	.51
519	.48	.52
521	.48	.54
524	.50	.55
527	.47	.53
531	.49	.55
536	.49	.55
540	.49	.56
544	.48	.53
548	.48	.54
550	.49	.56
553	.48	.54
556	.50	.58

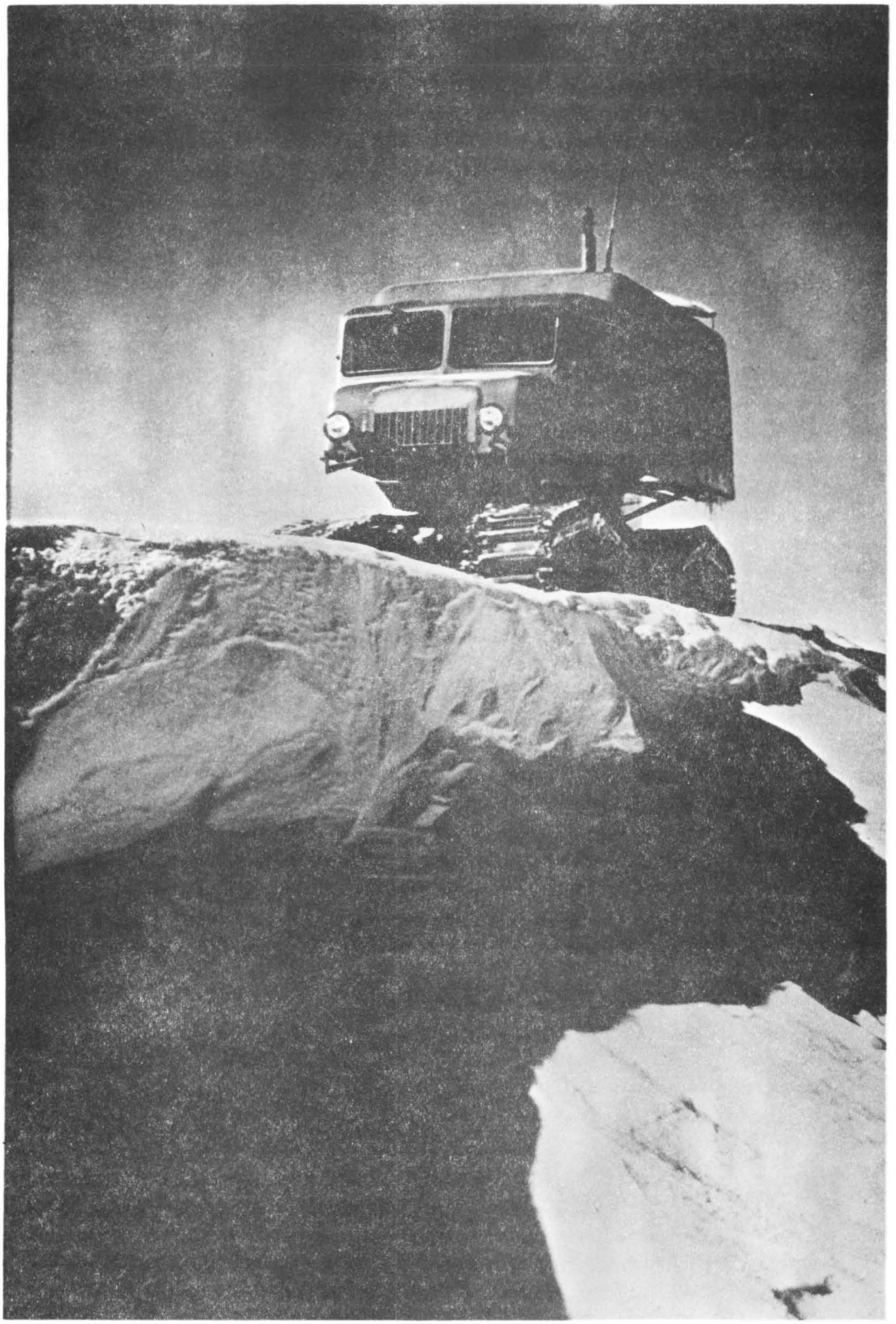
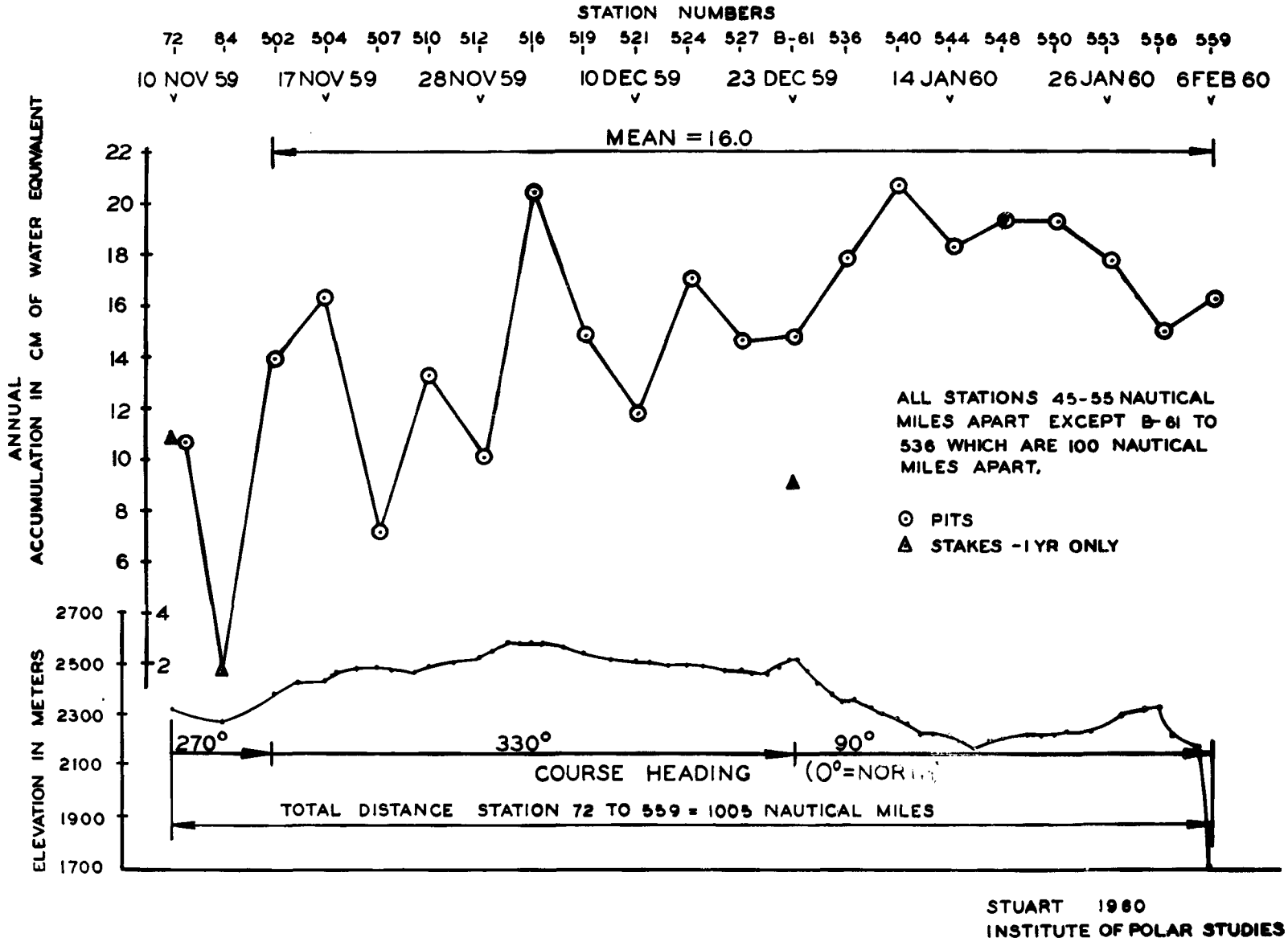
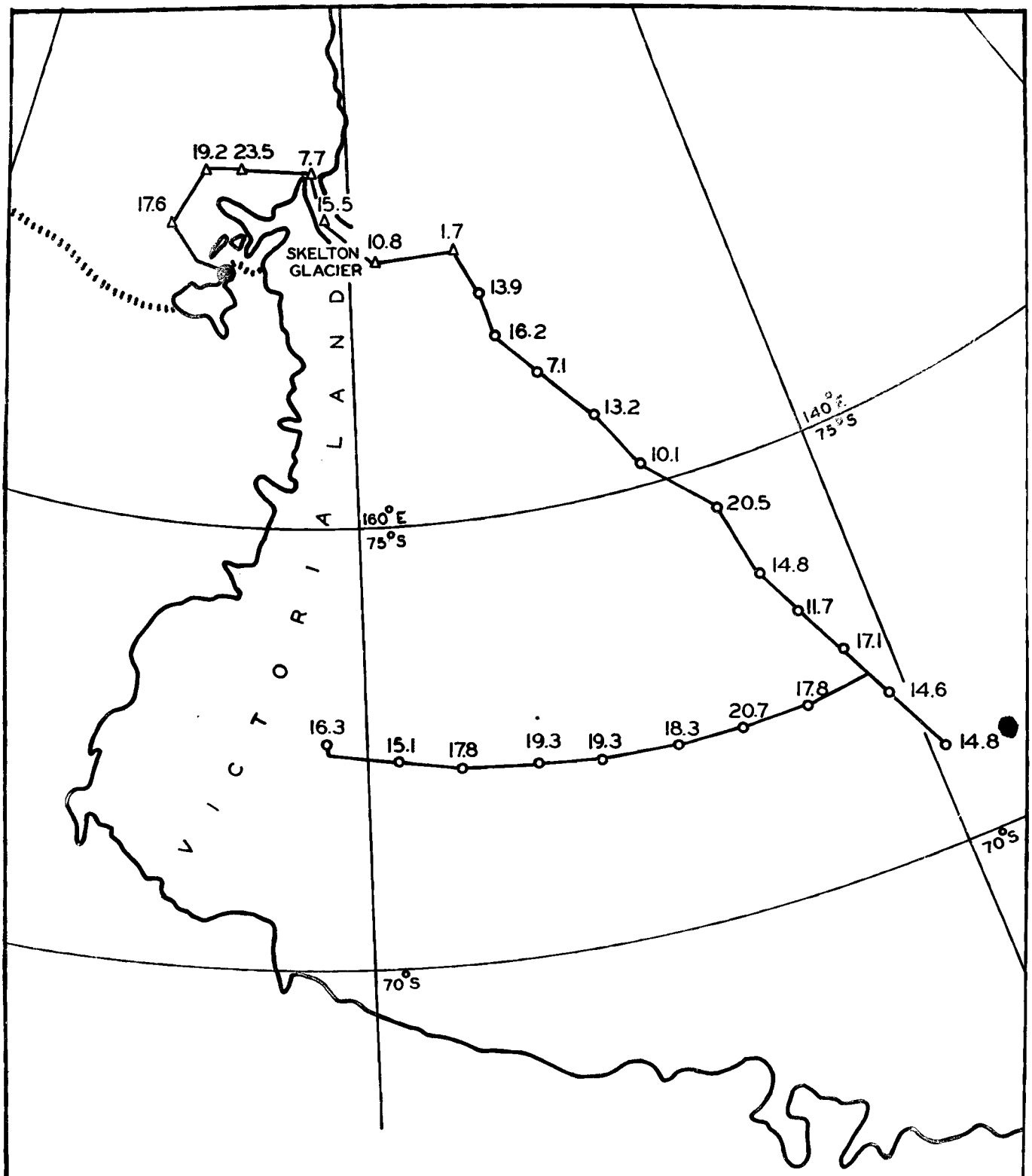


Figure 1. Linear sastrugus near Station 527. Maximum relief about one meter.

FIGURE 2

ANNUAL ACCUMULATION IN CENTIMETERS OF WATER
ALONG ROUTE OF 1959-60 VICTORIA LAND TRAVERSE





ACCUMULATION VALUES
1959-60 VICTORIA LAND TRAVERSE
ANNUAL ACCUMULATION (CM OF WATER)
A.W. STUART 1960
INSTITUTE OF POLAR STUDIES
THE OHIO STATE UNIVERSITY

O PITS
Δ STAKES

FIGURE 3

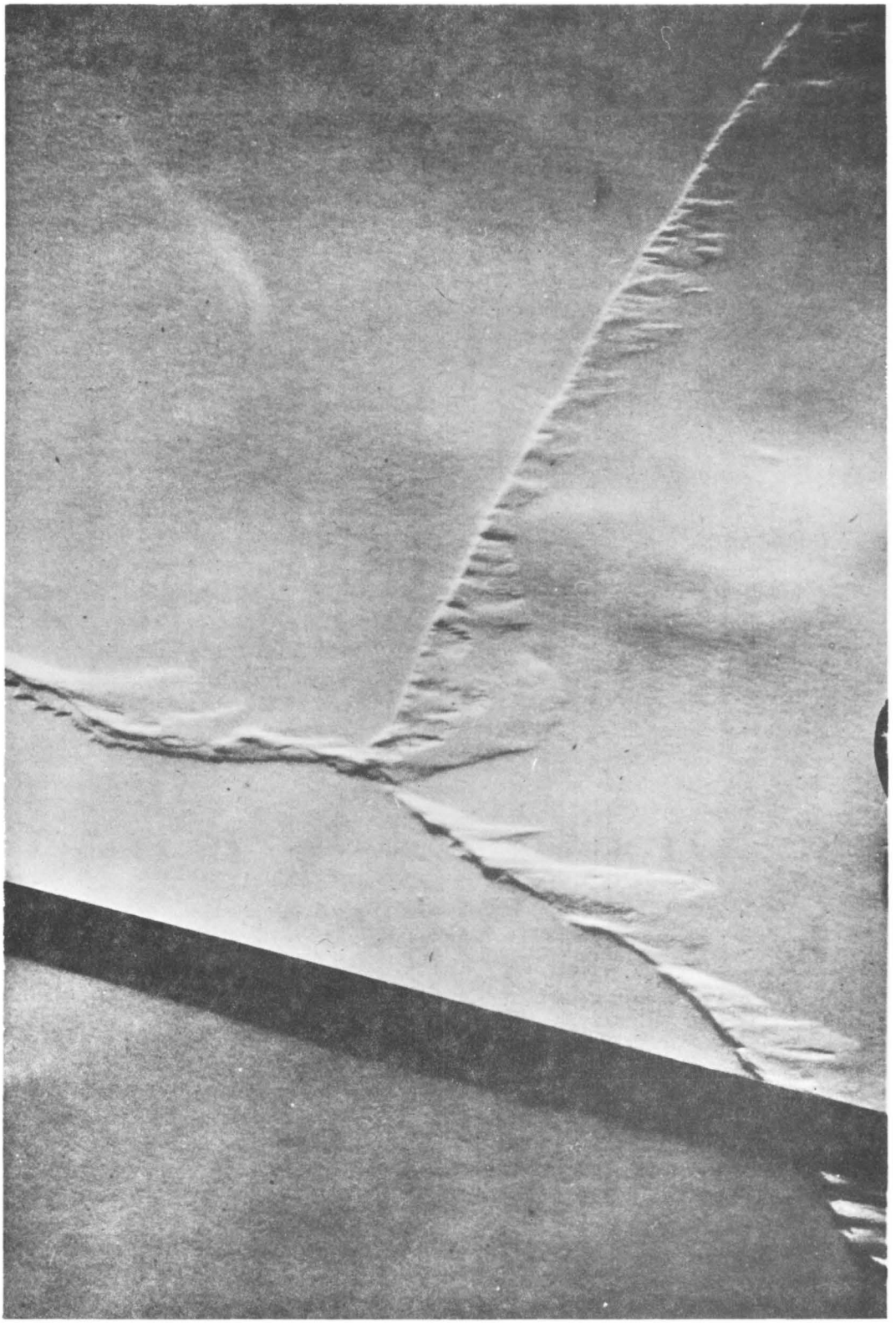


Figure 4. Vertical photograph of crack in hard, glazed surface. Rod about 60 cm long.

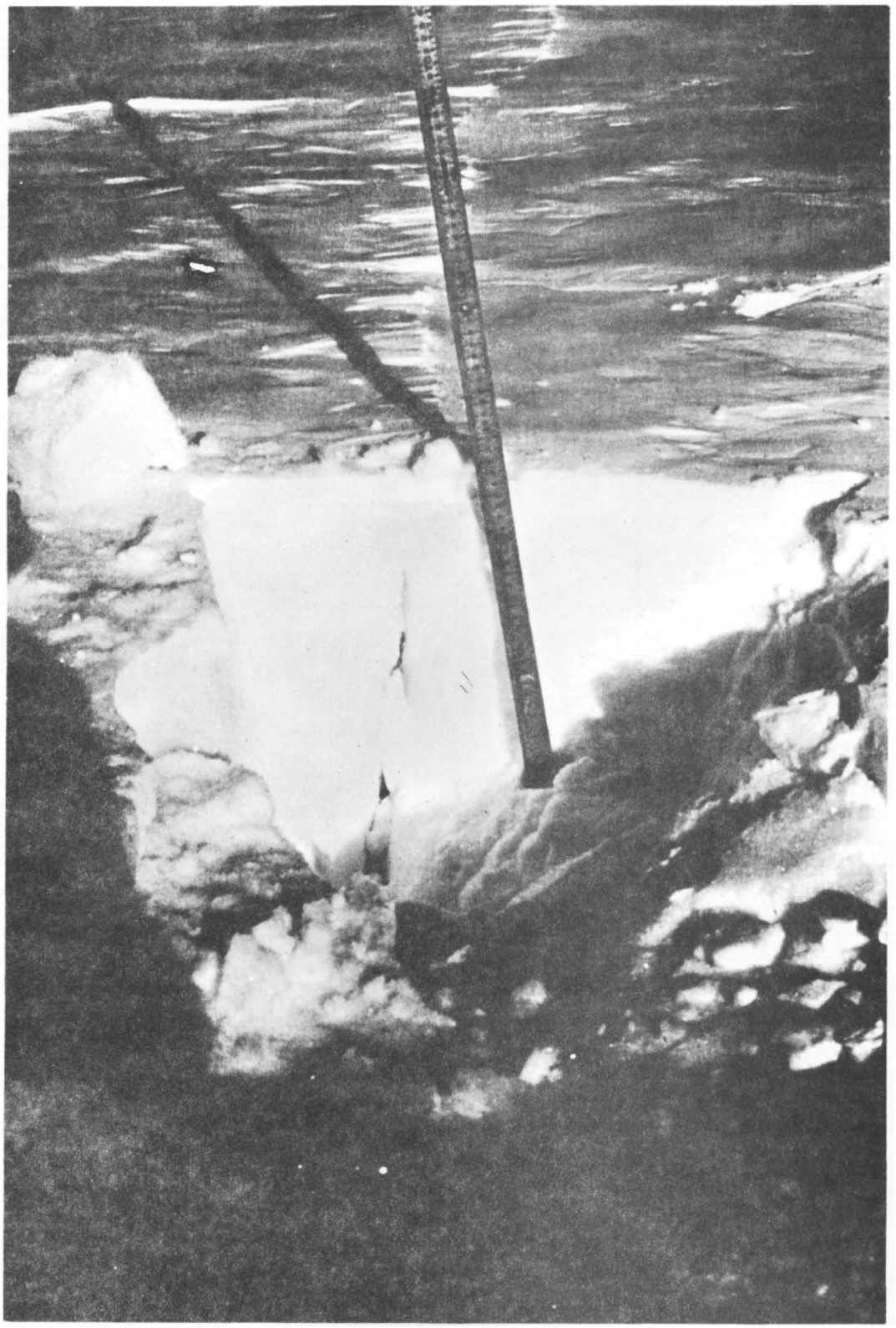


Figure 5. Cross section through cracked surface. Note that crack widens with depth. Portion of meter stick shown about 75 cm long.

FIGURE 6

COMPARISON OF THICKNESS OF FOUR ANNUAL LAYERS FROM VICTORIA LAND

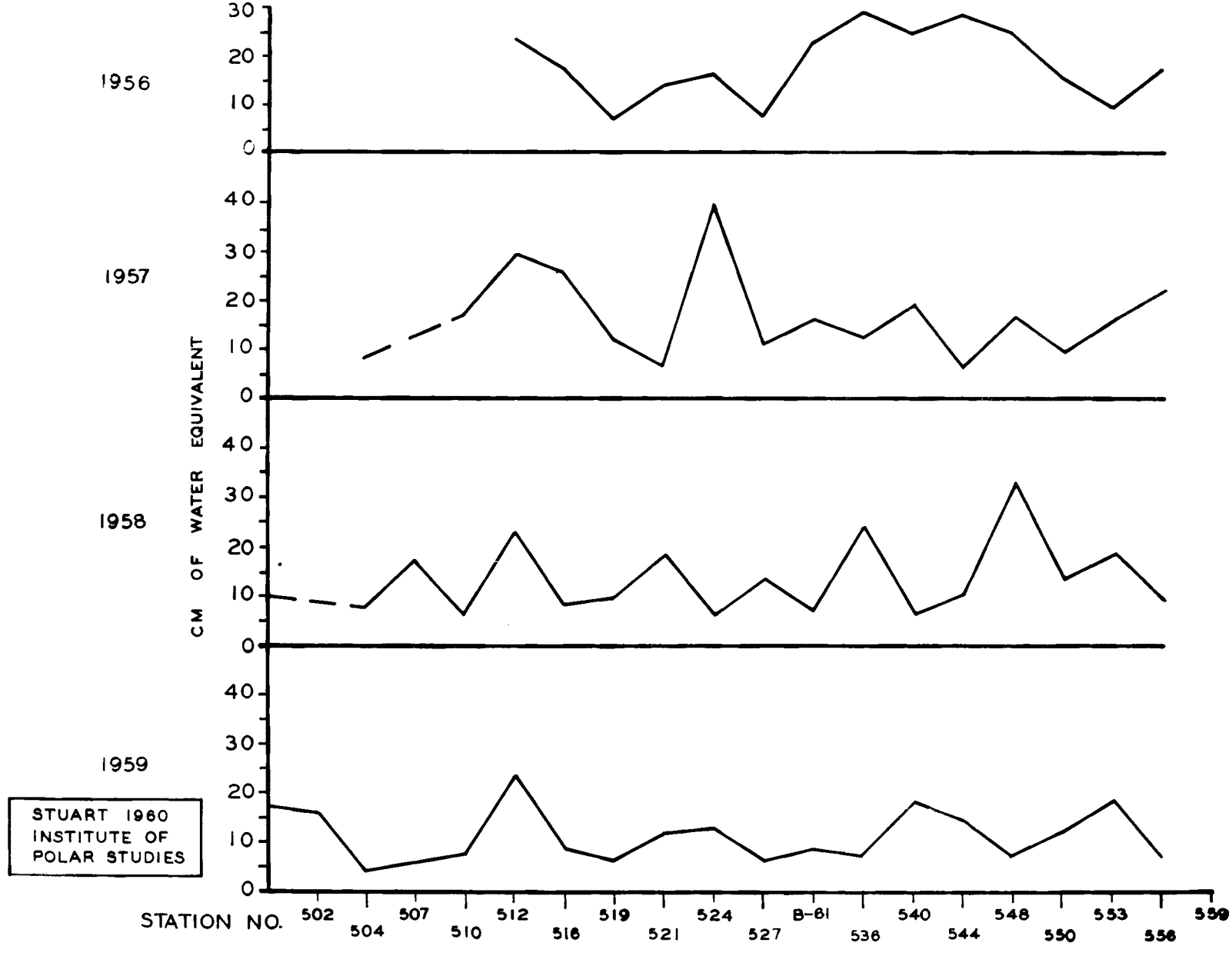
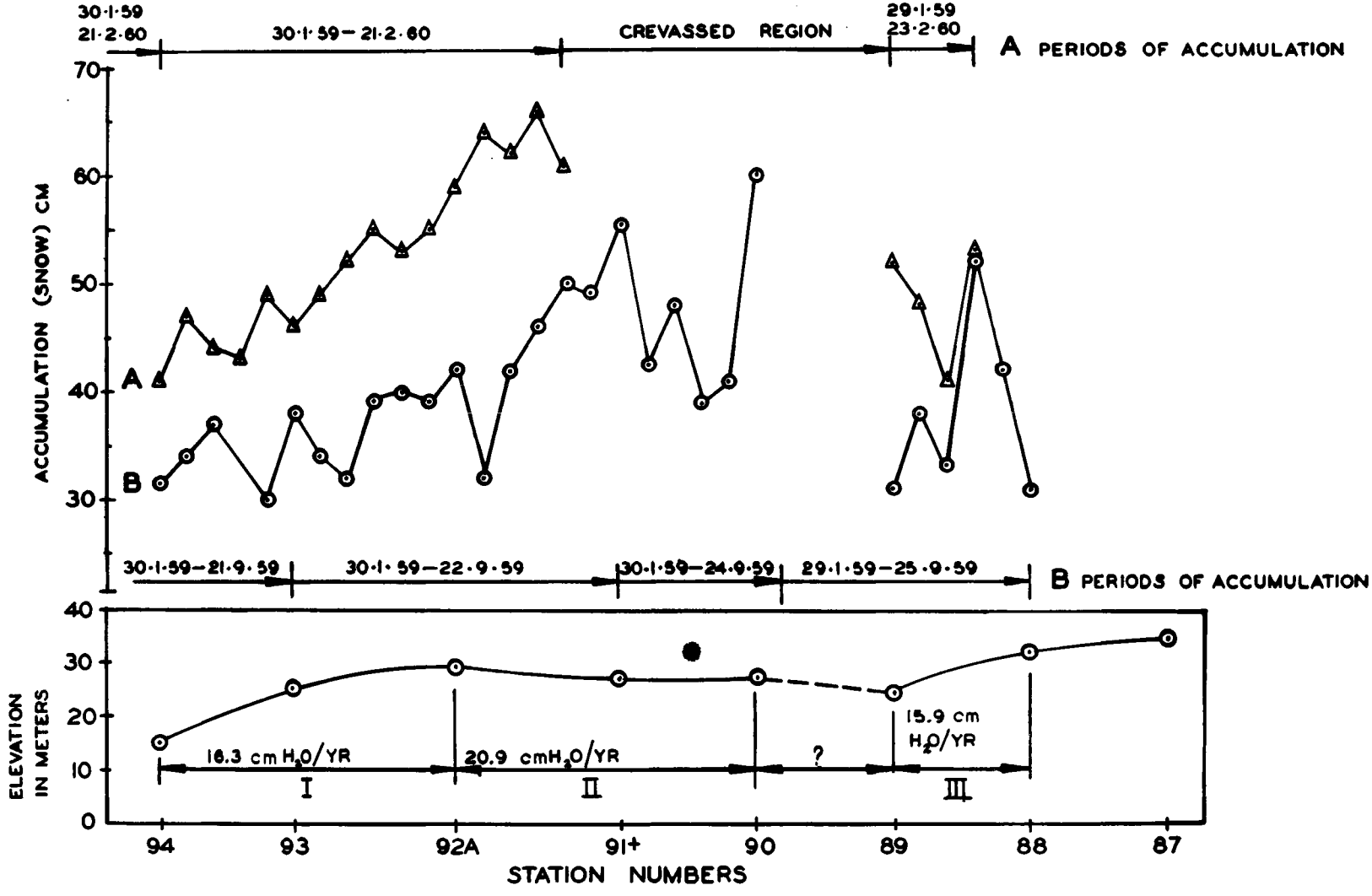


FIGURE 7

STAKE MEASUREMENT OF ACCUMULATION ALONG THE TRAIL TO L.A.S.



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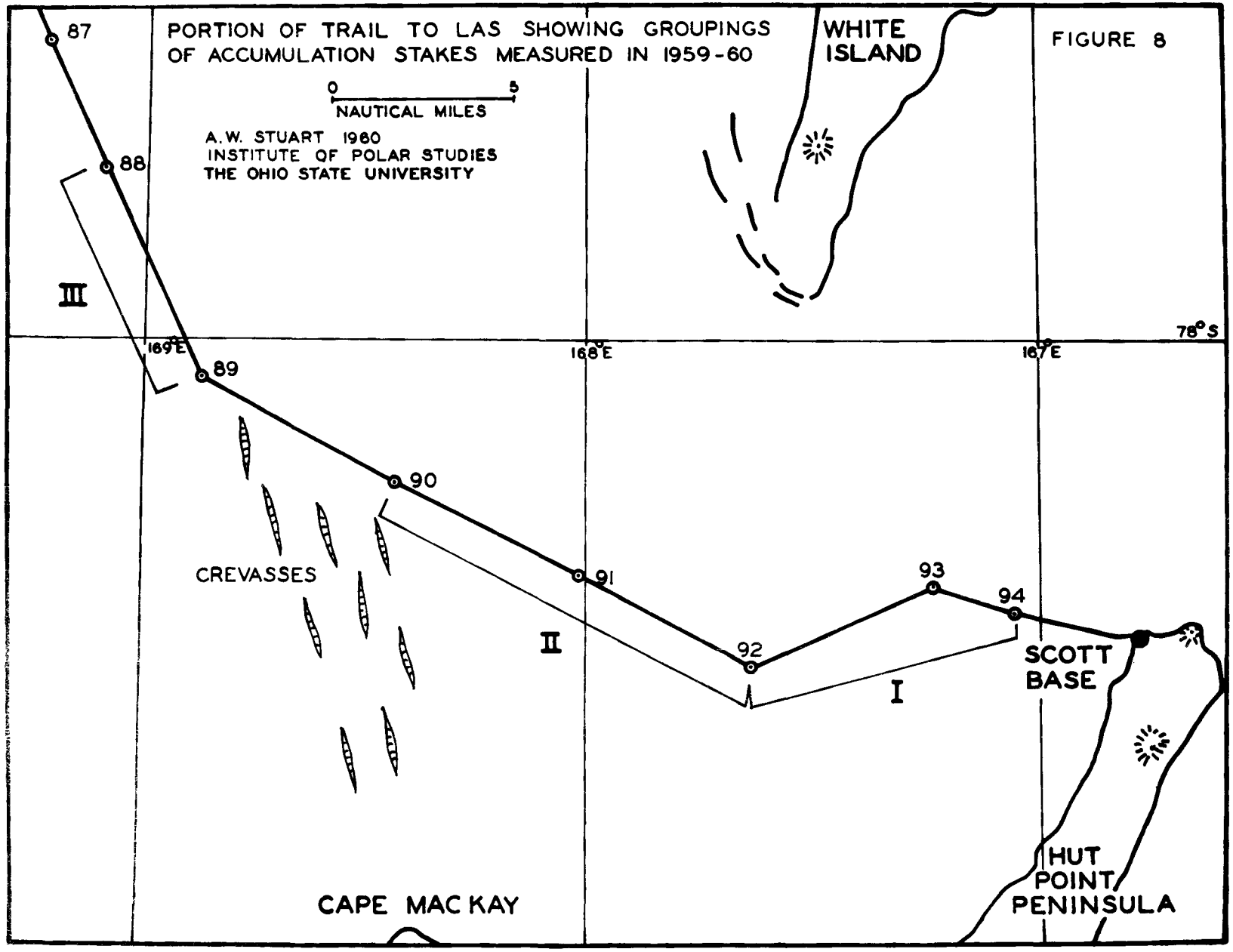
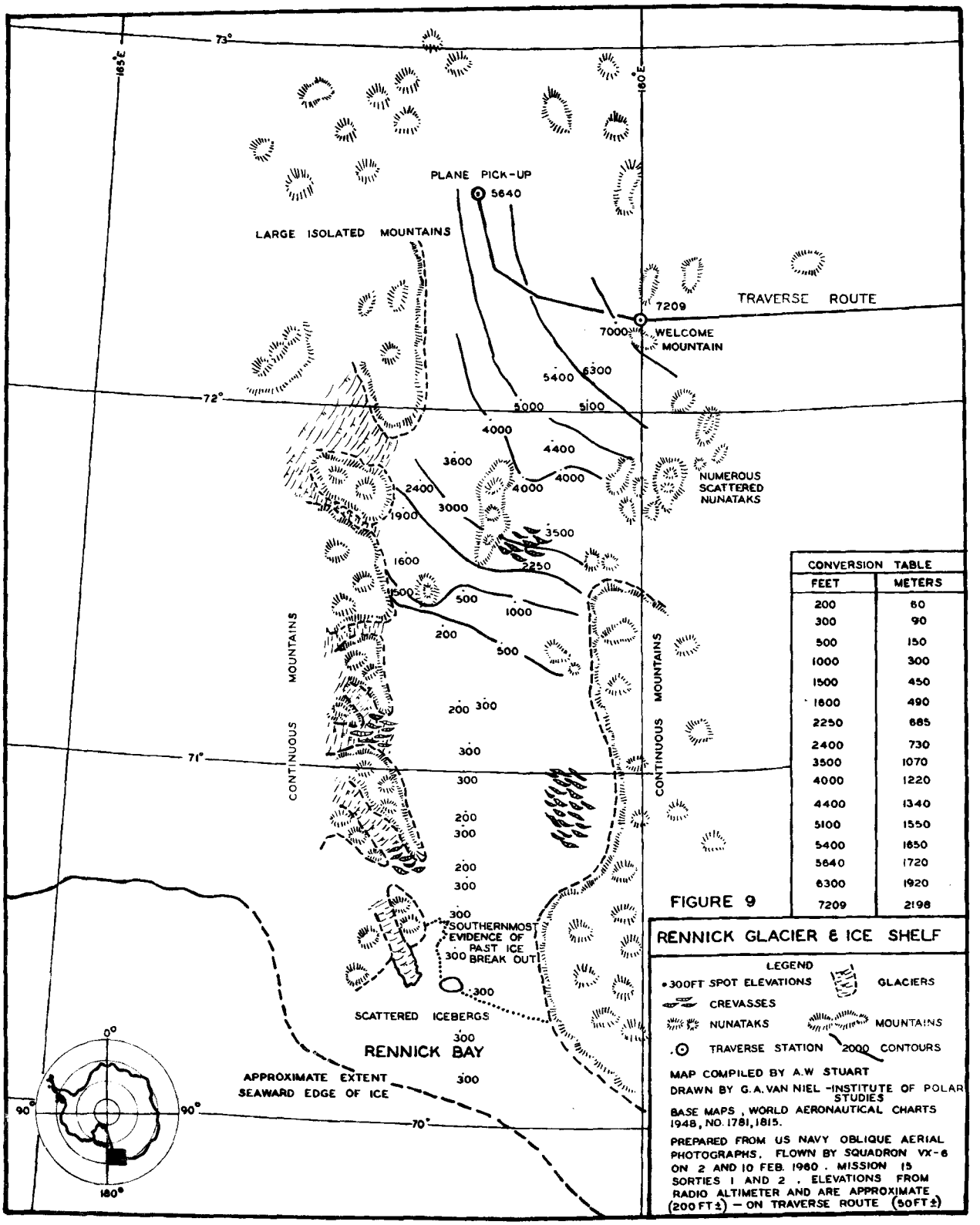
INSTITUTE OF POLAR STUDIES


PORTION OF TRAIL TO LAS SHOWING GROUPINGS OF ACCUMULATION STAKES MEASURED IN 1959-60
FIGURE 8
0
5
NAUTICAL MILES
A.W. STUART 1960
INSTITUTE OF POLAR STUDIES
THE OHIO STATE UNIVERSITY
WHITE ISLAND
87
88
89
90
91
92
93
94
III
II
I
169°E
168°E
167°E
78°S
CREVASSES
SCOTT BASE
HUT POINT PENINSULA
CAPE MAC KAY



CONVERSION TABLE	
FEET	METERS
200	60
300	90
500	150
1000	300
1500	450
1600	490
2250	685
2400	730
3500	1070
4000	1220
4400	1340
5100	1550
5400	1650
5640	1720
6300	1920
7209	2198

FIGURE 9

RENNICK GLACIER & ICE SHELF

LEGEND

- •300FT SPOT ELEVATIONS
- GLACIERS
- CREVASSES
- NUNATAKS
- MOUNTAINS
- TRAVERSE STATION
- 2000 CONTOURS

MAP COMPILED BY A.W STUART

DRAWN BY G.A. VAN NIEL - INSTITUTE OF POLAR STUDIES

BASE MAPS, WORLD AERONAUTICAL CHARTS 1948, NO. 1781, 1815.

PREPARED FROM US NAVY OBLIQUE AERIAL PHOTOGRAPHS. FLOWN BY SQUADRON VX-6 ON 2 AND 10 FEB. 1960. MISSION 15 SORTIES 1 AND 2. ELEVATIONS FROM RADIO ALTIMETER AND ARE APPROXIMATE (200 FT ±) — ON TRAVERSE ROUTE (50 FT ±)

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APPENDIX I

STRATIGRAPHIC DATA

AND

PIT DIAGRAMS

North Victoria Land Traverse
Station: 72.2
Date: 10 November 1959
Observers: Stuart, Heine

Hardness Symbols:

S	Soft
M	Medium
H	Hard
VH	Very Hard

Second accum. pole west of 72; about 0.6 nautical miles. Showed 38 cm of snow since 17/12/58.

Stratigraphic Data

Depth (cm)	Hardness	Grain Size	Remarks
0-13	S	I	New snow; bottom varies between 8 and 13 cm
13			Thin crust
13-17	S	I	
17-34	S	I	Numerous cross-cutting sastrugi
34-38	VS	I,II,III	Summer surface
38-42	M	I,II	Thin crust at 41
42-57	S-M	I,II	Thin crust at 46
57-59	H	I	
59-100	S-M	I	

Thin crusts at 60, 64.5, 67, 79, 88, and 91

Depth (cm)	Density g/cm^3
2.5	.310
7.0	.348
12.0	.360
18.0	.360
21.0	.360
26.0	.338
32.0	.320
37.0	.310
44.0	.342
50.0	.418
55.0	.420
61.0	.360
67.5	.342
73.5	.372
79.0	.404
	Avg. .358

North Victoria Land Traverse
Station: 500 (84)
Date: 12 November 1959
Observers: Stuart, Heine

Stratigraphic Data

Depth (cm)	Hardness	Grain Size	Remarks
0 -3.5	S	I	Loose
3.5-8.5	M-H	I	
8.5-9.0	VS	I	Summer surface
9.0			Thin crust
9.0-12	S	I	Hoar-like
12.0-14.5	H	I	
14.5			Thin crust
14.5-23	S	I	Hoar-like
23			Thin crust
23-29	S	F	Hoar-like
29			Thin crust
29-38	S	F	Hoar-like
38-40			Thick crust, 1-4 cm thick
40-47	S	L	Hoar

Depth (cm)	Density g/cm^3
3	.262
7	.288
12	.352
15	.344
22	.332
26	.308
32	.294
38	.368

Avg. .318

North Victoria Land Traverse
Station: 502
Date: 15 November 1959
Observers: Stuart, Heine

Stratigraphic Data

Depth (cm)	Hardness	Grain Size	Remarks
0-8	S	I	New snow
8			Thin crust
8-29	S-M	I	
29-42	M	I	Faint internal banding
42			Thin crust
42-50	S	I,II	Very soft, irregular but continuous layer at
50-58	H	I	
58-64	VS	III	Hoar-like
64			Medium crust
64-73	S	III	Hoar-like, bottom very uneven
73-86	S-M	III	
86-87	S	I	
87-106	M	II,III	
106-107	S	II,III	
107-114	H	I	
114-130	M	II,III	
130			Thin crust
130-135	M	II,III	
135-147	S-M	III,IV	
147			Thin crust
147-148	S-M	III,IV	
148-159	H	I,II,III	
159			Thin crust
159-175	S-M	III,IV	
175-195	VH	I	
195-197	S	II,III	
197-201	S	IV	Hoar-like, uneven layer
201-206	M	III,IV	
206			Thin, uneven crust
206-212	S	IV	Hoar-like
212-238	H	I,II	
238-248	VH	I	
248-252	S	III,IV	Hoar-like
252-260	M	II,III	
260-262	S	III,IV	Hoar-like
262-265	S-M	II,III	
265-273	VH	I	
273-282	S-M	II,III	
282-287	M	II,III	
287-300	H	II,III	

North Victoria Land Traverse
Station: 502
Observations: Stuart, Heine

Depth (cm)	Density g/cm^3	Depth (cm)	Density g/cm^3
3	.430	114	.428
7	.416	119	.388
11	.380	125	.370
16	.392	131	.418
23	.380	137	.398
26	.406	144	.390
31	.406	150	.438
36	.422	157	.416
42	.362	166	.412
48	.438	184	.506
54	.356	203	.378
60	.336	211	.420
66	.346	217	.460
72	.344	227	.432
77	.364	242	.476
82	.388	252	.430
87	.402	264	.410
94	.406	274	.402
100	.416	280	.414
108	.472	291	.410

Avg. .406

North Victoria Land Traverse
Station: 504
Date: 17 November 1959
Observers: Stuart, Heine

Stratigraphic Data

Depth (cm)	Hardness	Grain Size	
0-17	H	I	Contains hoar-like material in wedge 0-5cm thick and 50cm long.
17-25	S	II,III	
22-25	S-M	II,III	Thin crusts at 23 and 25
25-40.5	VS-M	III,IV,V	Some well developed hoar crystals up to 4mm
40.5			Thin crust
40.5-72.5	M-H	II,III	
72.5			Thin crust
72.5-74.	H	I	
74-75.5	S	V	Hoar up to 4mm
75.5			Thin, uneven crust
75.5-77.5	M	II,III	
77.5			Thin crust
77.5-84.5	M-S	II,III,IV,V	Layer grades from medium grained and dense at top to soft hoar at bottom
84.5			Uneven but continuous crust
84.5-86	M	II,III	Contains small pocket of hoar
86-104.5	S	V	Hoar with crystals up to 5mm
104.5-112	M	III	Hoar-like
112-122	S	V	Hoar to 5mm
122-181	M	II,III	1cm to thick pockets of hoar at 139 and 142: 3cm pocket at 148
181-191	S	V	Hoar-like
191			Thin crust
191-192	H	I	
192-193	S	V	Hoar to 5mm
193-198	M	II,III	
198-	S	V	Hoar to 4mm

Depth (cm)	Density g/cm^3	Depth (cm)	Density g/cm^3	Depth (cm)	Density g/cm^3
9	.450	67	.458	140	.384
20	.360	90	.370	154	.402
28	.366	104	.462	170	.466
36	.360	119	.346	186	.372
49	.430	131	.424	195	.428

Avg. .401

North Victoria Land Traverse
Station: 507
Date: 22 November 1959
Observers: Stuart, Heine

Stratigraphic Data

Depth (cm)	Hardness	Grain Size	Remarks
0-8	M	I,II	
8-11	S	II,III	
11-27	M	I,II	
27-31	S-M	I,II,III	Zone of alternating crusts and hoar
31-48	M	II,III	
48-53	S	V	Hoar to 4mm
53-77	H	I,II	
77-87	S	V	Hoar to 4mm; layer only 3cm thick in some places
87-94	M	III,IV	
94-112	S	IV,V	Hoar to 5mm at top; rest hoar-like
112-117	M	I,II,III	
117-124	S	V	Hoar to 4mm
124-127	M	I,II,III	
127-132.5	S	IV	Hoar-like
132.5-136	VS	V	Hoar to 5mm
136-145	M	I,II,III	
145-148	S	II,III	
148-157	S-M	I,II,III	
157-158	S	IV	Hoar-like
158-160	M	I	
160-169	S	V	Hoar to 4mm
169-173	S-M	I,II,III	
173			Thin crust
173-183	S-M	I-IV	Partially hoar-like
183-190	VH	I,II,III	
190-209	S-M	V	Hoar to 5mm
209			Thin crust
209-215	M	II,III	
215			Irregular crust
215-238	M	III,IV	Hoar-like
238-249	S	V	Hoar to 6mm
249-254	M-H	II,III,IV	
254-268	S	IV	Hoar-like
268-289	M	II,III,IV	
300+	VH	I	

North Victoria Land Traverse
Station: 507
Observers: Stuart, Heine

Depth (cm)	Density g/cm^3	Depth (cm)	Density g/cm^3
4	.422	137	.438
8	.380	144	.398
14	.412	151	.426
19	.416	158	.370
25	.408	163	.330
31	.346	171	.368
37	.422	179	.372
43	.426	193	.386
49	.362	199	.380
55	.490	207	.376
64	.480	213	.432
70	.456	218	.398
77	.402	225	.422
83	.412	230	.452
89	.420	238	.352
95	.420	243	.356
102	.344	251	.428
105	.366	256	.362
112	.388	266	.414
117	.416	272	.414
123	.408	278	.426
131	.348	282	.430

Avg. .402

North Victoria Land Traverse
Station: 510
Date: 25 November 1959
Observers: Stuart, Heine

Stratigraphic Data

Depth (cm)	Hardness	Grain Size	Remarks
0-11	S	I	
11-			Thin uneven crust
11-12	M	I	Variable thickness
12-15	S	III,IV	Thin crust at 14
15			Thin crust, uneven but continuous
15-46	M	I,II,III	Uniform, continuous layer
46			Thin crust
46-47	M	I,II,III	
47-56	S	II,III	
56			Medium crust
56-58.5	S	IV	Hoar-like
58.5-64	H	I	
64-69	S	IV	Hoar-like
69-80	H	I,II,III	
80-91	S	IV	Hoar-like
91-117	M-H	I,II,III	
117-123	M	III,IV	
123-133	M-H	I,II,III	
133-136	S-M	IV	Layer of variable thickness
136			Thin crust
136-146	S-M	III,IV	
146-161	VS	V	Hoar to 5mm
161-168	M	II,III	Uneven layer
168-174	S	IV	Hoar-like
174-177	S-M	I,II,III	Uneven layer
177-192	S-M	III,IV	
192			Thin crust
192-198	M	I,II,III	
198-218	S	III,IV	
218			Thin to thick crust
218-227	M	II,III	Contains pocket of coarser material in center
227			Medium crust
227-236	M	I,II,III	
236-254	S-M	III,IV	Hoar-like
254-276	M-H	I,II,III	Contains several crusts and pockets of hoar
276-280	S	V	Hoar to 4mm
280-297	M	IV	
297-300+	S	V	Hoar to 4mm

North Victoria Land Traverse
Station: 510
Observers: Stuart, Heine

Depth (cm)	Density g/cm^3	Depth (cm)	Density g/cm^3
4	.450	153	.390
11	.356	160	.410
15	.376	166	.418
24	.400	171	.366
30	.408	177	.400
36	.414	183	.352
42	.426	189	.418
49	.410	195	.380
56	.374	205	.380
64	.406	207	.378
71	.480	212	.378
79	.484	220	.404
85	.406	225	.408
92	.404	232	.408
98	.440	237	.376
107	.464	244	.390
111	.462	252	.374
115	.414	257	.410
120	.448	266	.404
129	.440	271	.404
135	.384	279	.386
141	.388	284	.400
147	.358	291	.416
		305	.372

Avg. .405

North Victoria Land Traverse
Station: 512
Date: 27 November 1959
Observers: Stuart, Heine

Stratigraphic Data

Depth (cm)	Hardness	Grain Size	Remarks
0-6	S	I	
6-9	S	I,II,III	
9			Medium crust
9-11	M	I,II,III	Discontinuous
11-20	S	III,IV	Hoar to 3mm
20-26	M	II,III	
26-36	S	III,IV	Hoar-like; uneven and discontinuous
36-44	S-M	I,II,III	Contains discontinuous, uneven body of hard, fine snow
44			Thin crust
44-59	S	I,II,III	Bottom contact uneven
59-63	H	I	Discontinuous; not in photo
63			Thin, uneven crust
63-73	S	II,III	
73-77	M-H	I,II,III	
77-79	S	IV,V	Hoar to 4mm
79-80	H	I,II,III	Very uneven; 6cm thick in photo
80-98	S	III,IV	Hoar-like
98-106	M	I,II,III	
106-107	S	III,IV,V	Hoar to 4mm
107-114	M	I,II,III	
114-116	VS	V	Hoar to 5mm; bottom uneven
116			Medium crust, uneven
116-129	S	V	Hoar to 4mm; layer 5 to 15cm thick with indulating bottom
129-142	H	I	
142-156	S	III,IV,V	Hoar to 4mm
156			Thin crust; uneven
156-157	S	V	Well developed hoar to 5mm
157-167	M	III,IV	
167-172	H	I	Discontinuous; ends in middle of photo
172-190	S	III,IV	Hoar-like
190			Thin crust

Stratigraphic Data (Cont'd)

Depth (cm)	Hardness	Grain Size	Remarks
190-195	M	I,II,III	
195-200	S	III,IV,V	Hoar to 5mm
200-210	M	III,IV	
210-243	M	III,IV	
243			Thin crust
243-253	M-H	I,II,III	
253-287	M	III,IV	
287			Thin crust
287-305	S	V	Hoar to 5mm
305+	H	F	

Depth (cm)	Density g/cm^3	Depth (cm)	Density g/cm^3
5	.330	152	.390
9	.396	157	.378
14	.336	162	.464
20	.400	167	.464
25	.412	173	.346
30	.430	178	.348
36	.318	185	.364
43	.350	188	.388
48	.366	196	.350
54	.418	198	.338
61	.452	204	.372
67	.404	210	.380
72	.390	214	.356
79	.396	219	.380
85	.352	228	.394
92	.384	234	.402
97	.414	241	.402
103	.406	245	.422
109	.376	251	.414
115	.324	257	.420
122	.388	262	.428
128	.384	268	.434
135	.406	271	.384
141	.454	278	.412
146	.382	285	.404
		291	.358

Avg. .389

North Victoria Land Traverse
Station: 516
Date: 4 December 1959
Observers: Stuart, Heine

Stratigraphic Data

Depth (cm)	Hardness	Grain Size	Remarks
0-11	S	I	New snow
11			Thin crust
11-20	M	I	
20-28	M-H	I	
28-46	M	I	
46			Thin crust
46-55	S-M	I	Thin crust at 52
55-59	S	I,II,III	Hoar to 2 mm; layer of variable thickness
59-107	M-H	I	Uniform, dense layer
107-109	S	V	Hoar to 4 mm
109-129.5	S-M	I,II, III	
129.5			Thin crust
129.5-143	S-M	I,II,III	
143-150	M	I,II,III	
150			Medium, uneven crust
150-159	S-M	II,III	
159-171	S-M	III,IV	
171-187	S	V	Hoar to 5 mm; bottom of layer uneven
187-205	H	I	Contains undulating, 1 cm thick hoar layer that varies in depth between 188 and 210
205-212	M	II,III	Irregular layer
212-220	H	I,II,III	
220			Thin crust, uneven
220-226	S-M	III,IV,V	Hoar to 4 mm
226-230	VH	I,II,III	Very irregular layer
230-240	S	V	Hoar to 5 mm. Very irregular body surrounded on both sides by very hard, dense snow
240-253	VH	I,II,III	
253-270	S	V	Hoar to 5 mm. Bottom of layer undulating
270-300	VH	I	
300+	S	V	Hoar to 5 mm.

North Victoria Land Traverse
Station: 516
Observers: Stuart, Heine

Depth (cm)	Density g/cm^3	Depth (cm)	Density g/cm^3
3	.426	138	.383
7	.428	145	.414
13	.412	149	.398
18	.388	158	.390
24	.404	162	.356
29	.386	169	.380
34	.398	173	.310
40	.450	181	.312
45	.410	189	.384
52	.360	197	.452
57	.374	201	.474
63	.416	206	.414
67	.450	212	.428
75	.448	217	.488
79	.460	222	.364
87	.456	229	.508
92	.454	235	.434
98	.462	246	.442
106	.460	253	.378
112	.396	258	.354
119	.388	263	.380
123	.412	272	.396
130	.378	277	.422

Avg. .410

North Victoria Land Traverse
Station: 519
Date: 7 December 1959
Observers: Stuart, Heine

Stratigraphic Data

Depth (cm)	Hardness	Grain Size	Remarks
0-3	S	I	New snow
3-16	M	I	
16-22	S-M	I	
22			Uneven, medium crust. Combines at one point with crust at 24.
22-24	M	I	
24			Medium crust
24-30	M	I	
30-31	S	I,II,III	Discontinuous low density pocket
31-40	M	I	
40			Uneven, medium crust
40-43	S	IV,V	Hoar to 3mm
43-74	M	I	
74			Multiple, thin, uneven crusts
74-95.5	S	III,IV,V	Hoar to 4mm
95.5			Thin crust
95.5-104	M	II,III	
104-107	S	IV,V	Hoar to 4mm; discontinuous pocket
107			Thin, uneven crust
107-119	M	I,II,III	Bottom uneven
119			Thin, uneven crust
119-124.5	M	I,II,III	Sloping contact with snow above and below
124.5-149	M	I	
149-152	M	III,IV	Hoar-like
152-158	M-H	I,II,III	
158			Thin crust
158-177	VH	I	
177-179	M	II,III	
179-187	S	V	Hoar to 5mm
187-205	M	I,II,III	
205-209	M	IV,V	Hoar to 4mm
209-226	M-H	I,II,III	Thick high density layers alternating with thin low density layers
226-236	M	I,II,III	

Stratigraphic Data (Cont'd)

Depth (cm)	Hardness	Grain Size	Remarks
236-241	S	III,IV	
241-			Thin crust
241-248	M-H	I	Contains small, discontinuous pocket of hoar
248-253	S-M	III,IV,V	Hoar to 4mm
253-259	M	I,II,III	
259-273	H	I	
273-274	S-M	I,II,III	
274-283	M	I,II,III	
283-290	S	V	Hoar to 5mm
290-297	H	I,II,III	
297-300+	S	I-IV	

Depth (cm)	Density g/cm^3	Depth (cm)	Density g/cm^3
2	.388	139	.434
8	.406	144	.416
13	.420	151	.418
18	.378	157	.442
24	.394	164	.456
29	.390	168	.442
35	.410	174	.424
40	.384	179	.560
46	.424	180	.402
52	.420	186	.396
58	.420	192	.392
63	.422	200	.400
69	.432	208	.398
75	.404	214	.406
81	.376	223	.480
88	.374	230	.428
93	.396	237	.406
97	.396	243	.420
104	.408	252	.380
109	.354	261	.430
114	.322	268	.448
119	.344	274	.396
126	.412	282	.380
132	.394	295	.430
	Avg. .404		

North Victoria Land Traverse
Station: 521
Date: 10 December 1959
Observers: Stuart, Heine

Stratigraphic Data

Depth (cm)	Hardness	Grain Size	Remarks
0-5	S	I	New snow
5-8	M	I	
8-13	S-M	I	
13-14			Thick crust; 2cm in places
14-18	S	II,III	
18-30	M	I,II,III	
30			Uneven crust
30-32	H	I	
32-43	S	V	Hoar to 4mm; uneven layer
43-54	M-VH	I	Hardest at top; becoming more poorly cemented towards bottom; top contact variable
54-65	M	I,II,III	
65			Thin, uneven crust
65-72	S-M	V	Hoar to 5mm; layer uneven
72-84	M	I,II,III	
84-91	S	II,III,IV	
91-98	M	I	
98-104	S-M	I,II,III	
104-108	M-H	I	
108-117	M	I	
117-120	M-H	I	
120-122	S	II,III	Layer up to 10cm thick in places; intertongues with layer below
122-139	M	I	Thin crust at 135
139-144	S	II,III	
144-147	M-H	I,II,III	
147-152	S	III,IV,V	Hoar to 4mm
152-157	M	I,II,III	
157-163	S	III,IV,V	Hoar to 6mm
163-167	M	I	
167-169	S	V	Hoar to 5mm; layer of variable thickness
169-173	M-H	I	
173-175	S-M	III,IV,V	Hoar to 5mm
175-189	M-H	I,II,III	
189-191	S-M	III,IV	Hoar to 3mm
191-203	M	II,III,IV	

Stratigraphic Data (Cont'd)

Depth (cm)	Hardness	Grain Size	Remarks
203-221	M-H	I,II,III	
221-223	S-M	II,III	
223-233	S-M	I,II,III	
233-234			Thick to thin crust
234-237	M	IV,V	Hoar to 4mm
237-251	M-H	II,III,IV	
251-267	S-M	II,III,IV	
267-281	M-H	I,II,III	
281			Thin crust
300+	M-H	I,II,III	

Depth (cm)	Density g/cm^3	Depth (cm)	Density g/cm^3
5	.406	148	.382
10	.352	157	.330
15	.304	165	.340
21	.408	172	.424
26	.406	181	.408
32	.398	189	.400
39	.338	199	.400
44	.454	204	.454
51	.458	205	.400
57	.404	211	.456
63	.416	217	.456
68	.342	223	.420
75	.400	227	.398
82	.392	233	.398
90	.376	237	.410
95	.382	243	.382
104	.386	249	.354
111	.376	254	.356
115	.396	262	.384
121	.424	269	.398
127	.422	277	.412
134	.402	285	.442
141	.410	290	.424
		296	.436

Avg. .398

North Victoria Land Traverse
Station: 524
Date: 14-15 December 1959
Observers: Stuart, Heine

Stratigraphic Data

Depth (cm)	Hardness	Grain Size	Remarks
0-13	S-M	I	New snow
13-			Thin, uneven crust
13-25	M	I	
25-30	S	I	Both contacts uneven
30-45	M-H	I	Cross-bedded; old sastrugi
45-53	S	I,II,III	
53-56	M-H	I	Layer of variable thickness
56-78	S	III,IV	Hoar-like; bottom uneven
78-90	VH	I	
90-93	S-M	III,IV	Hoar-like; layer very uneven
93-111	H	I	
111-119	S-M	II,III	
119-128	S	III,IV	Hoar-like
128-157	M-H	I	
157-164	M-H	I,II,III	
164-178	VH	I	Both contacts uneven
178-186	M	I,II,III	
186-231	VH	I	
231-244	S-M	III,IV	Hoar-like
244-			Thin, uneven crust
244-50	H	I	
250-252	M	III,IV,V	Hoar to 4mm; uneven layer
252-276	M	II,III	
276-300+	H	I	

North Victoria Land Traverse
Station: 524
Observers: Stuart, Heine

Depth (cm)	Density g/cm^3	Depth (cm)	Density g/cm^3
4	.410	122	.408
10	.426	127	.376
16	.404	134	.422
23	.348	139	.418
27	.362	145	.398
34	.414	152	.438
39	.426	159	.418
48	.338	177	.392
53	.418	183	.360
58	.324	194	.464
64	.356	214	.466
70	.338	235	.420
77	.404	239	.432
83	.432	247	.472
90	.440	252	.358
98	.386	259	.398
110	.382	266	.414
117	.412	273	.458
		285	.466

Avg. .403

North Victoria Land Traverse
Station: 527
Date: 19 December 1959
Observers: Stuart, Heine

Stratigraphic Data

Depth (cm)	Hardness	Grain Size	Remarks
0-26	S-M	I	
26-30	S	I	Hoar-like
30-40	M	I	
40-45	S-M	I	Hoar-like
45-			Thin, uneven crust
45-78	M	I,II,III	
78-			Thin, uneven crust
78-103	M-H	I,II,III	Contains much small sastrugi
103-			Thin, uneven crust
103-118	S	III,IV	Hoar to 3mm. This is a bulge in an otherwise level and continuous layer.
118-130	M	I,II,III	
130-135	S	III,IV,V	Hoar to 4mm; sloping layer. On another face this layer is connected to the one at 103-118.
135-			Medium, very uneven crust
135-169	M-H	I,II,III	Much sastrugi
169-171	M	II,III,IV	Hoar-like
171-187	H	I	
187-189	S	IV	Hoar-like; layer of variable thickness.
189-216	M	II,III	
216-227	H	I,II,III	
227-238	S-M	II,III,IV	
238-255	H	I,II,III	
255-256	S-M	IV	Hoar-like
256-			Medium, uneven crust
256-269	S	IV	Hoar-like
269-281	M	I,II,III	
281-286	S	IV	Hoar-like
286-308	M-H	I,II,III	
308-311	S-M	II,III,IV	Hoar-like
311+	M-H	I	

North Victoria Land Traverse
Station: 527
Observers: Stuart, Heine

Depth (cm)	Density g/cm^3	Depth (cm)	Density g/cm^3
3	.422	137	.470
7	.416	143	.470
14	.392	149	.414
20	.396	158	.434
25	.488	165	.450
32	.402	171	.448
36	.434	177	.456
42	.362	185	.450
47	.418	195	.436
55	.394	204	.426
59	.388	211	.460
66	.376	222	.464
72	.410	233	.388
78	.440	243	.460
83	.424	252	.450
89	.436	259	.342
94	.434	270	.406
102	.430	279	.430
109	.412	289	.406
116	.384	300	.436
124	.400	305	.436
130	.388	310	.410

Avg. .422

North Victoria Land Traverse
Station: 531 (B-61)
Date: 24 December 1959
Observers: Stuart, Heine

Stratigraphic Data

Depth (cm)	Hardness	Grain Size	Remarks
0-13	S-M	I	
13-16	S	I	Irregular layer
16			Thin, uneven, discontinuous crust
16-35.5	M-H	I	
35.5			Thin ice laminae; not level
35.5-37	H	I	
37-52	S	I	
52-53	VS	I	Very irregular layer; 5cm thick in center of photo
53-60	M	I	
60-70	M-H	I	Cross bedded; sastrugi
70			Thin, uneven ice laminae
70-78	M	I	
78-87	S	II,III	Hoar-like
87			Thin, uneven crust
87-97	M-H	I,II,III	
97			Thin, sloping crust
97-103	S-M	II,III	Hoar-like
103-112	M	I,II,III	
112-124	M-H	I	
124-126	VH	I	Discontinuous wedge
126			Thin, uneven crust
126-129	S-M	II,III,IV	Hoar-like
129-139	H	I	
139			Thin, uneven crust
139-149	M	II,III,IV	
149-172	M	I,II,III	
172-182	M-H	I	
182-192	S	II,III,IV	Hoar-like; uneven layer
192-195	H	I	Discontinuous; parallels above layer
195-207	S-M	II,III,IV	Hoar-like
207-244	M-H	I,II,III	
244			Thin crust
244-264	M	I,II,III	Some hoar development at top of layer
264-285	M-H	I	Lens of very hard snow bottom
285-292	S-M	II,III,IV	Hoar-like
300+	M-H	I,II,III	

North Victoria Land Traverse
Station: 531 (B-61)
Observers: Stuart, Heine

Depth (cm)	Density g/cm^3	Depth (cm)	Density g/cm^3
6	.418	129	.460
12	.412	136	.402
16	.372	144	.370
22	.396	149	.386
28	.436	156	.418
35	.430	160	.426
40	.294	167	.424
45	.314	175	.420
50	.314	183	.338
56	.342	188	.388
60	.392	196	.388
66	.400	203	.424
72	.398	207	.450
79	.316	217	.444
82	.348	226	.464
88	.392	238	.448
94	.402	248	.420
98	.382	258	.454
105	.352	275	.458
113	.424	289	.382
121	.480	300	.438
	Avg. .400		

North Victoria Land Traverse
Station: 531 (B-61)
Date: 24 December 1959
Observers Lorius

Face No. 1 of pit by accumulation stake. Latter indicated 23cm of snow accumulated in previous 12 months.

Stratigraphic Data

Depth (cm)	Hardness	Grain Size (mm)	Remarks
0-7	S	0.3-0.1	
7			Thin crust
7-16	M-H	0.1-0.4	
16-25	S	0.3-0.7	
25			Thin crust
25-48	M-H	0.2-0.5	
48			Thin crust
48-51	S	0.5-1.0	
51			Very thin crust
51-67	S	0.7-1.5	
67			Thin crust
67-76	H	0.3-0.7	
76-81	M-H	0.5-0.9	
81-86	S-M	0.6-1.0	
86-106	H	0.3-0.5	
106			Thin crust
106-113	S	0.8-1.5	

Face No. 2

0-8	S-M		New snow
8			Thin crust
8-30	M-H	0.4-0.5	
30			Thin crust
30-35	M-S	0.4-0.8	
35			Thin crust
35-42	M-H	0.3-0.5	
42-62	M-S	0.5-1.0	
62-97	M-H	0.4-0.7	
97			Thin crust
97+	S	0.7-1.0	

North Victoria Land Traverse
Station: 531 (B-61)
Observers: Lorius

Depth (cm)	Density g/cm^3	Depth (cm)	Density g/cm^3
Face No. 1		Face No. 2	
4	.446	4	.418
12	.378	12	.426
21	.318	18	.430
29	.422	23	.424
35	.416	32	.392
42	.416	40	.410
52	.342	45	.378
59	.306	54	.362
71	.408	58	.390
77	.440	65	.412
82	.432	76	.448
90	.458	88	.442
100	.418	100	.346
110	.338		
Avg. .396		Avg. 406	

North Victoria Land Traverse
Station: 536
Date: 4 January 1960
Observers: Stuart, Heine

Stratigraphic Data

Depth (cm)	Hardness	Grain Size	Remarks
0-17	M	I	
17-22	S	I	
22-33	M-H	I	Top irregular
33			Thin, uneven crust
33-36	M	I	
36-39	S-M	I	
39-50	M	I	
50-57	M	I	
57			Thin ice laminae
57-61	M	I	
61-66	H	I	
66-73	S	IV	Hoar-like
73			Medium, uneven crust
73-79	S	IV	Hoar-like
79-88	M	II,III,IV	
88-111	M-H	I,II,III	
111			Thin, uneven crust
111-121	H	I,II,III	Uneven layer
121-134	S	III,IV	Hoar-like
134-143	M	II,III	
143-167	H	I,II,III	
167-181	S	IV	Hoar-like
181-182			Thick crust
182-214	M-H	I,II,III	
214-235	H-VH	I	
235-237	S-M	II,III	
237-242	M	II,III	
242			Medium, uneven crust
242-246	S	III,IV	Hoar-like
246-248	VH	I	
248-263	S-M	V	Hoar to 4mm
263-278	M-H	I,II,III	
278-289	H	I	
289-300+	M-H	I,II,III	

North Victoria Land Traverse
Station: 536
Observers: Stuart, Heine

Depth (cm)	Density g/cm^3	Depth (cm)	Density g/cm^3
3	.442	121	.412
9	.412	126	.340
14	.388	131	.350
18	.316	138	.378
24	.428	144	.446
30	.430	149	.458
36	.398	158	.482
41	.438	169	.356
46	.414	178	.356
52	.422	187	.394
58	.424	198	.424
65	.436	205	.434
70	.350	212	.412
76	.344	220	.460
82	.444	238	.416
90	.440	245	.392
96	.410	253	.282
101	.414	266	.370
108	.456	274	.422
115	.464	283	.458
		297	.454

Avg. .409

North Victoria Land Traverse
Station: 540
Date: 9 January 1960
Observers: Stuart, Heine

Stratigraphic Data

Depth (cm)	Hardness	Grain Size	Remarks
0-6	S	I	New snow
6-12	M-H	I	
12-19	S	II,III	Hoar-like
19-25	S-M	I,II,III	
25-			Medium crust
25-32	M-H	I,II,III	
32-			Thin crust
32-40	H	I	
40-54	H	I,II,III	
54-			Medium, uneven crust
54-64	S-M	III,IV,V	Hoar-like. Contains a pocket of hoar with grains to 5mm
64-67	H	I	
67-79	S-M	V	Hoar to 5mm
79-92	VH	I	
92-106	S-M	III,IV,V	Hoar to 5mm
106-122	M	I,II,III	
122-151	M-H	I,II,III	
151-159	S	II,III	
159-162	H	I	
162-172	S-M	II,III,IV	Hoar-like
172-			Thin crust
172-188	M	II,III	
188-			Medium crust
188-199	H	II,III,IV	
199-			Medium crust
199-228	M-H	II,III	
228-231	H	II,III	
231-234	S	III,IV,V	Hoar to 4mm. Pinches out; not in density tube.
234-282	VH	I,II,III	
282-288	S-M	IV	Hoar-like
288-320+	VH	I	

North Victoria Land Traverse
Station: 540
Observers: Stuart, Heine

Depth (cm)	Density g/cm^3	Depth (cm)	Density g/cm^3
3	.422	116	.448
6	.440	121	.440
13	.424	129	.454
17	.324	135	.414
22	.388	143	.446
28	.420	149	.458
33	.422	156	.406
39	.442	166	.432
44	.426	173	.436
50	.438	180	.422
56	.360	188	.448
62	.392	195	.420
68	.374	205	.472
74	.348	210	.414
79	.332	220	.418
86	.484	226	.424
93	.462	231	.460
97	.438	249	.480
103	.460	285	.412
109	.464	292	.442

Firn below this depth too hard for tubes;
tube at 249 representative for layer 234-282.

Avg. .425

North Victoria Land Traverse
Station: 544
Date: 13 January 1960
Observers: Stuart, Heine

Stratigraphic Data

Depth (cm)	Hardness	Grain Size	Remarks
0-3	S	I	New snow
3-11	M	I	
11-26	S-M	I	
26-37	M	I	
37-42	S-M	I,II,III	Hoar-like
42-53	VH	I	
53-56	S-M	II,III,IV	Hoar-like
56-61	M-H	I,II,III	
61-			Thin ice laminae
61-76	VH	I	
76-103	S	IV	Hoar-like
103-112	M	I,II,III	
112-114	S	II,III,IV	Hoar-like
114-125	H	I	
125-159	S-M	IV	Hoar-like
159-162	M	I,II,III	
162-163	S	IV	Hoar-like
163-172	M	I,II,III	
172-177	S-M	II,III,IV	
177-185	S	IV	Hoar-like
185-203	M-H	II,II,IV	
203-			Medium crust
203-211	M-H	II,III,IV	
211-222	S	IV	Hoar-like
222-285	M	II,III	
285-289	S-M	II,III,IV	
289-305	S	V	Hoar to 6mm

North Victoria Land Traverse
Station: 544
Observers: Stuart, Heine

Depth (cm)	Density g/cm^3	Depth (cm)	Density g/cm^3
5	.438	132	.408
10	.460	138	.392
17	.428	145	.400
22	.440	151	.410
28	.416	158	.394
33	.462	164	.434
38	.366	169	.442
44	.490	174	.446
51	.422	181	.372
68	.510	190	.432
73	.492	197	.458
80	.352	203	.484
85	.390	211	.388
92	.336	215	.420
97	.284	223	.428
107	.424	230	.446
111	.410	251	.418
117	.450	270	.478
124	.384	282	.418
		294	.378

Avg. .420

North Victoria Land Traverse
Station: 548
Date: 18 January 1960
Observers: Stuart, Heine

Stratigraphic Data

Depth (cm)	Hardness	Grain Size	Remarks
0-19	M	I	
19-			Thin crust
19-34	S-M	I	
34-45	M	I	
45-54	M	I	
54-60	S	I,II,III	Hoar-like
60-75	H	I	
75-			Thin crust
75-76	S	I,II,III	Hoar-like
76-77	H	I	
77-123	M-H	I	
123-127	H	I	
127-131	M	I	
131-			Thin ice laminae
131-139	M	I,II,III	
139-			Medium crust. Surrounded by discontinuous pocket of hoar
139-142	S-M	I,II,III	
142-144	S	V	Hoar to 5mm in discontinuous, sloping pocket
144-147	S-M	I-IV	
147-			Thin, uneven crust
147-169	M-H	I,II,III	
169-193	M	II,III	
193-			Medium crust
193-198	M-H	II,III	
198-210	S-M	II,III	Hoar-like
210-222	VH	I	
222-236	H	I	
236-240	M	I,II,III	
240-			Thin crust
240-244	M-H	I,II,III	
244-255	S-M	II,III,IV	Hoar-like; bottom uneven
255-275	H-VH	I,II	
275-280	M	I,II,III	
280-320	H-VH	I	
320-325	S	IV	Hoar-like

North Victoria Land Traverse
Station: 548
Observers: Stuart, Heine

Depth (cm)	Density g/cm^3	Depth (cm)	Density g/cm^3
4	.454	161	.402
9	.468	165	.392
14	.464	171	.416
19	.424	177	.378
25	.408	181	.360
30	.394	188	.388
37	.426	194	.428
		200	.366
42	.390	205	.352
48	.406		
53	.322	216	.520
61	.428	223	.464
65	.416	235	.450
72	.370	244	.366
80	.368	253	.370
		258	.450
87	.376	265	.470
93	.372	271	.496
97	.398	281	.456
106	.422	290	.446
113	.432	317	.408
119	.436		
124	.484		
129	.412		
136	.414		
142	.418		
148	.436		
153	.432		

Avg. .416

North Victoria Land Traverse
Station: 550
Date: 22 January 1960
Observers: Stuart, Heine

Stratigraphic Data

Depth (cm)	Hardness	Grain Size	Remarks
0-2	S	I	New snow
2-4	S	I	
4			Thin, uneven crust
4-5	S	I	
5			Thin, uneven crust. Several pockets of hoar between this crust and the one above
5-18	M	I	
18-43	S	I,II,III	
43-53	S-M	I	
53-81	M-H	I	
81-84	VS	IV	Hoar-like
84-95	M	I,II,III	
95-101	S-M	I-IV	Hoar-like
101-128	M	II,III	Thin crust at 113
128-141	S	III,IV	Hoar-like
141-154	M-H	I,II,III	
154			Thin crust
154-165	M	I	
165			Thin crust
165-186	M	I,II,III	
186			Thin crust
186-189	M	II,III	
189-192	S	III,IV	Hoar-like
192-196	S-M	II,III	
196-202	S	III,IV	Hoar-like
202-213	M-H	I,II,III	
213-221	S	II,III	
221-225	H	I	
225			Medium crust
225-226	S	III,IV	Hoar-like
226-236	H	I,II,III	
236-240	S	IV	Hoar-like
240-253	M	I,II,III	
253-284	H-VH	I	
284-288	S	IV	Hoar-like
288-297	M-H	II,III	
297-300+	H	I	

North Victoria Land Traverse
Station: 550
Observers: Stuart, Heine

Depth (cm)	Density g/cm^3	Depth (cm)	Density g/cm^3
4	.414	204	.374
10	.436	209	.396
15	.408	215	.364
21	.344	221	.436
26	.360	226	.372
33	.378	231	.402
39	.374	236	.346
45	.402	243	.362
52	.418		
59	.442	250	.418
66	.444	259	.470
72	.432	273	.412
78	.382	285	.360
84	.364		
91	.404		
94	.380		
102	.402		
108	.426		
114	.428		
120	.424		
126	.432		
133	.376		
140	.422		
147	.436		
157	.412		
164	.398		
171	.434		
178	.424		
185	.424		
192	.378		
198	.364		

Avg. .402

North Victoria Land Traverse
Station: 553
Date: 27 January 1960
Observers: Stuart, Heine

Stratigraphic Data

Depth (cm)	Hardness	Grain Size	
0-9	S	I	
9-12	M	I	
12-			Thin crust
12-14	M	I	
14-			Thin, uneven crust
14-19	S	I	
19-			Thin crust
19-31	S	I,II,III	
31-			Thin crust
31-38	S-M	I	
38-43	M-H	I	
43-56	S-M	[illegible]	
56-68	S	II,III,IV	Hoar-like
68-81	M-H	I,II,III	
81-87	S	II,III	
87-94	S	II,III,IV	Hoar-like
94-98	H	I	
98-			Medium crust
98-102	M	I,II,III	
102-104	S	II,III	
104-			Medium crust
104-115	M	II,III	
115-			Medium crust
115-124	S	IV	Hoar-like
124-131	M-H	I,II,III	Bottom uneven
131-136	S	IV	Hoar-like
136-137	M	I,II,III	
137-162	M	I,II,III	
162-164	H	I	
164-173	S	IV	Hoar-like
173-			Medium crust
173-184	S	II,III,IV	Hoar-like
184-196	S-M	II,III,IV	
196-209	VH	I	
209-224	M	II,III	
224-227	VH	I	
227-229	S	II,III,IV	Hoar-like
229-237	M	II,III	
237-243	S	II,III,IV	Hoar-like

Depth (cm)	Hardness	Grain Size	Remarks
243-248	M	II,III,IV	
248-			Thin, uneven crust
248-257	S-M	II,III	
257-261	S	II,III,IV	Hoar-like. Undulating layer
261-280	M	I,II,III	
280-292	M-H	II,III	
292-305	H	II,III	
305-315	M	II,III,IV	Hoar-like

Depth (cm)	Density g/cm^3	Depth (cm)	Density g/cm^3
4	.422	159	.424
11	.392	163	.432
15	.408	171	.324
21	.364	177	.362
26	.380	184	.368
32	.382	190	.396
37	.390	212	.444
44	.354	218	.444
49	.394	225	.444
55	.362	232	.468
62	.316	239	.382
68	.376	245	.418
72	.414	252	.386
79	.392	259	.394
86	.352		
91	.338	265	.426
98	.410	271	.428
102	.358	277	.424
107	.424	283	.462
113	.376	288	.420
119	.296	294	.420
124	.372	305	.416
130	.374		
136	.386		
142	.338		
150	.398		

Avg. .393

Layer 196-209 too hard for snow tubes

North Victoria Land Traverse
Station: 556
Date: 31 January 1960
Observers: Stuart, Heine

Stratigraphic Data

Depth (cm)	Hardness	Grain Size	Remarks
0-8	M-H	I	
8-21	S	I	
21			Thin crust
21-30	S-M	I	
30			Medium, uneven crust
30-32	S-M	I	
32			Thin, uneven crust. On another face this crust joins the crusts at 30 and 36
32-36	S	I	Hoar-like. Continuous layer
36			Thin, uneven crust
36-41	M	I	
41-46	S	I,II,III	
46-47	VS	I,II,III	Hoar-like
47-66	S	I	
66			Thin crust
66-75	S-M	I	
75			Thin crust
75-83	S-M	I,II,III	
83			Thin, uneven crust
83-86	S-M	I	
86-91	S-M	I	
91-98	VS	III,IV,V	Hoar to 4mm at top, rest hoar-like
98-121	M	I,II,III	
121-127	S	I,II,III	
127-135	M-H	I,II,III	
135-139	S	II,III,IV	Hoar-like
139-149	H	I	
149-162	VS	IV	Hoar-like
162-178	S-M	IV	
178-187	M-H	I,II,III	
187-194	S-M	II,III,IV	Hoar-like at top of layer
194-203	M-H	II,III	
203-205	S	IV	Hoar-like. Irregular but continuous
205-229	M-H	II,III	Pocket of hoar at 215
229			Thin crust
229-297	M-H	II,III	Large, irregular pocket of hoar at 240. Discontinuous on two other faces
297-300	S-M	II,III,IV	Hoar-like

North Victoria Land Traverse
Station: 556
Observers: Stuart, Heine

Depth (cm)	Density g/cm^3	Depth (cm)	Density g/cm^3
4	.476	169	.360
10	.376	177	.390
14	.392	184	.324
20	.400	191	.404
25	.402	198	.408
31	.378	204	.428
35	.414	210	.424
42	.366	216	.432
48	.386	222	.456
56	.352	226	.454
62	.404	235	.462
68	.374	244	.350
77	.356	255	.458
85	.388	271	.450
92	.372	288	.404
97	.334	302	.408
103	.416		
109	.420		
117	.436		
122	.364		
130	.402		
136	.354		
143	.446		
149	.378		
154	.338		
161	.424		

Avg. .399

North Victoria Land Traverse
Station: 559
Date: 6 February 1960
Observers: Stuart, Heine

Stratigraphic Data

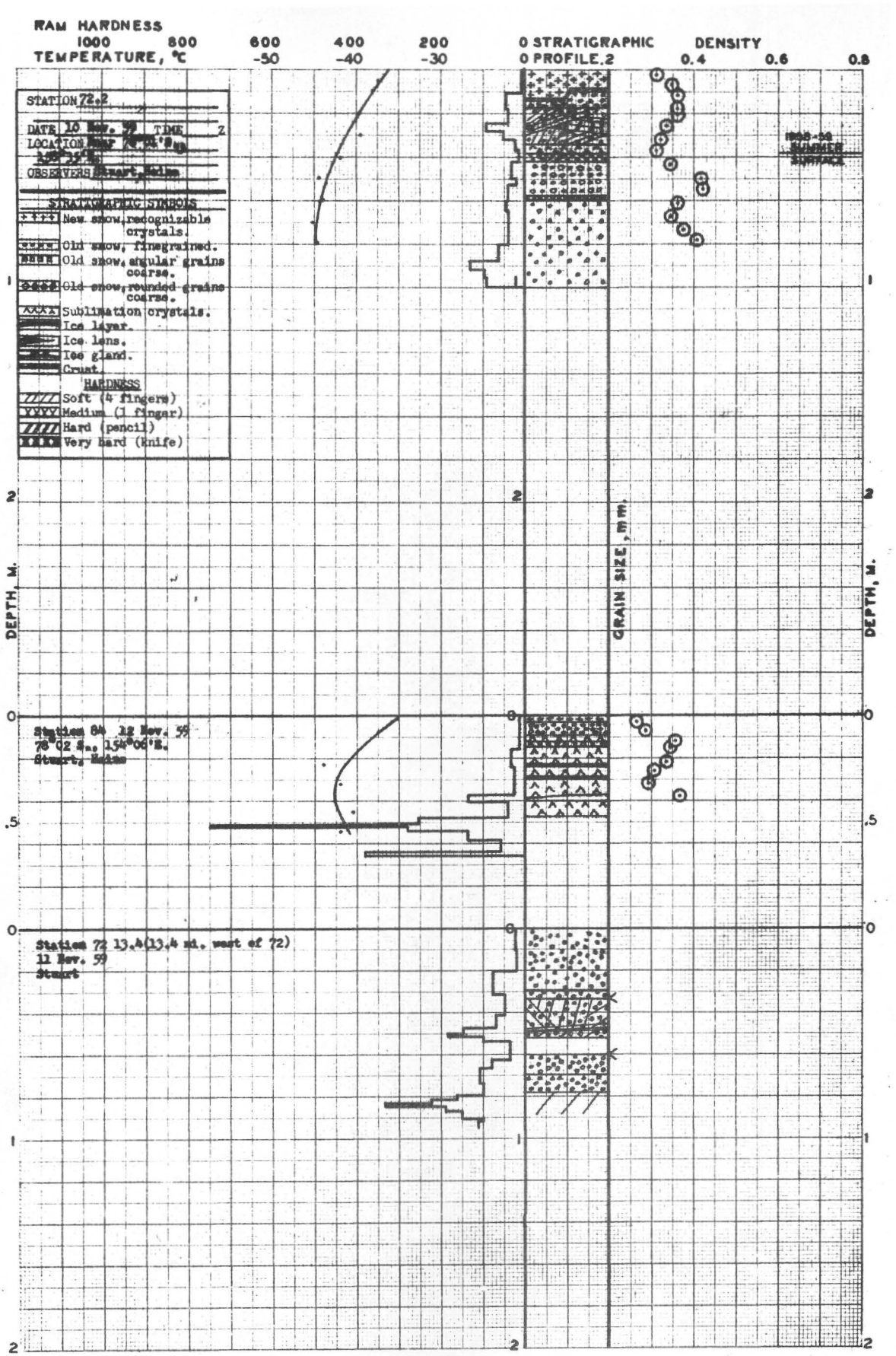
Depth (cm)	Hardness	Grain Size	Remarks
0-11	S	I	New snow
11-14	H	I	Partly replaced by layer below
14-20	S	I,II,III	Hoar-like
20-			Medium multiple ice laminae
20-35	S	I,II,III	
35-			Thin, uneven crust. Pocket of hoar above the crust
35-40	S-M	I,II,III	
40-			Thin crust
40-43	S	II,III,IV	Hoar-like
43-50	M	I,II,III	
50-58	S-M	I,II,III	
58-			Thin ice laminae
58-64	M-H	I,II,III	
64-			Medium, multiple ice laminae
64-75	M-H	I,II,III	
75-77	S	V	Hoar to 6mm in discontinuous layer
77-			Thin, uneven multiple ice laminae
77-87	S-M	I-V	Layer of hoar intertonguing with fine, hard snow
87-94	S	V	Hoar to 6mm
94-			Thin ice laminae
94-97	H	I	Uneven layer
97-116	M	II,III	
116-			Thin crust
116-121	S-M	II,III,IV	

Data for stratigraphy from this point to bottom at 200 cm was lost but partial reconstruction was possible through the use of the photographs of the pit face.

North Victoria Land Traverse
Station: 559
Observers: Stuart, Heine

Depth (cm)	Density g/cm^3	Depth (cm)	Density g/cm^3
6	.332	110	.436
11	.396	117	.392
15	.332	123	.412
21	.380	129	.428
27	.398	136	.354
33	.442	144	.438
41	.378	152	.430
45	.458	158	.470
52	.414	165	.466
60	.440	172	.448
67	.504	178	.448
75	.458		
82	.464		
89	.328		
95	.460		
103	.438		

Avg. .420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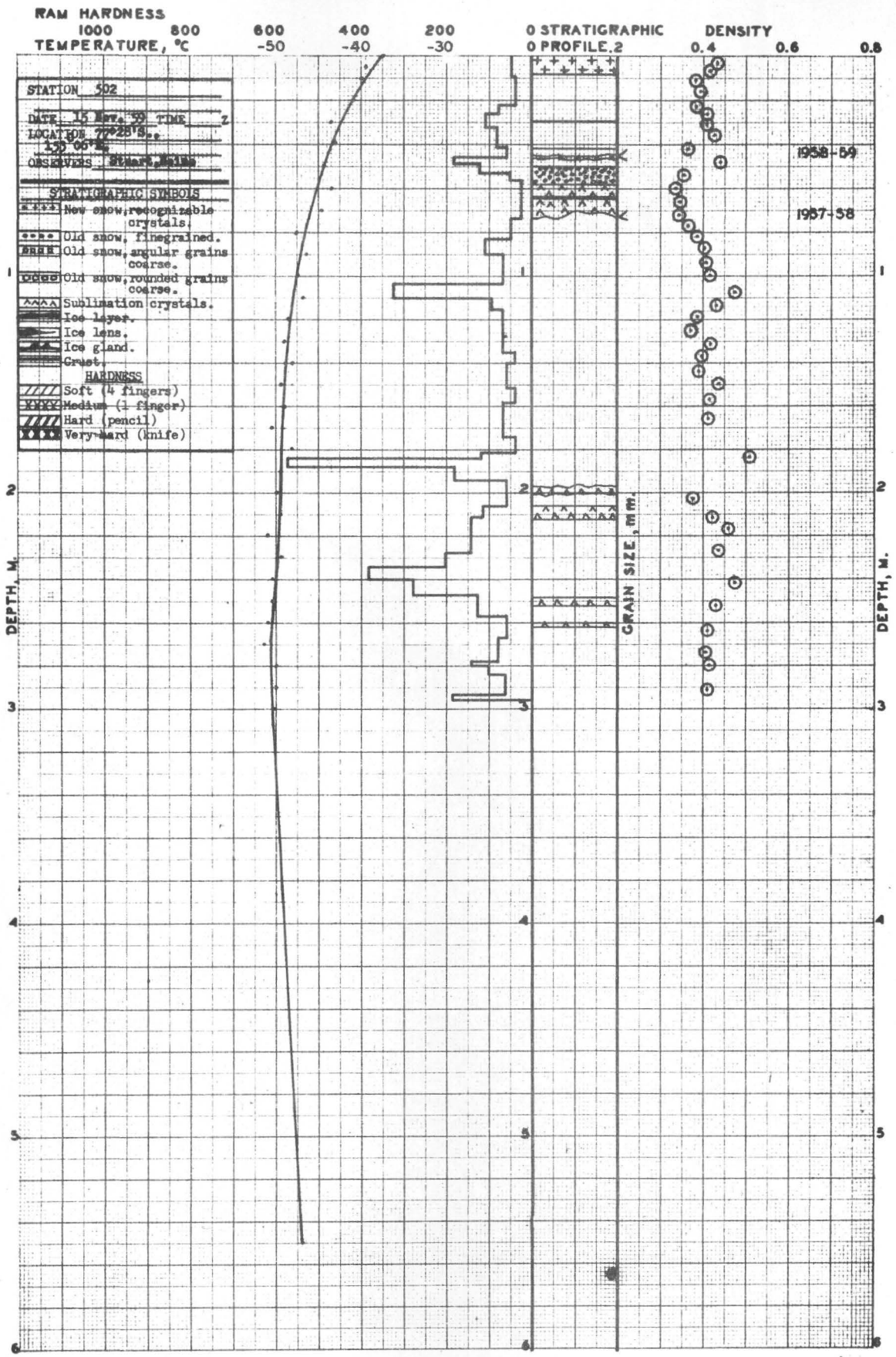
1000 800 600 400 200
TEMPERATURE, °C -50 -40 -30
0 STRATIGRAPHIC
0 PROFILE, 2
DENSITY
0.4 0.6 0.8
STATION 72.2
DATE 10 Nov. 59 TIME Z
LOCATION NEAR 71°24'N, 156°35'W.
OBSERVERS Stuart, Maine
STRATIGRAPHIC SYMBOLS
New snow, recognizable crystals.
Old snow, finegrained.
Old snow, angular grains coarse.
Old snow, rounded grains coarse.
Sublimation crystals.
Ice layer.
Ice lens.
Ice gland.
Crust.
HARDNESS
Soft (4 fingers)
Medium (1 fingar)
Hard (pencil)
Very hard (knife)
DEPTH, M.
GRAIN SIZE, mm.
Station 84 12 Nov. 59
70°02 N., 154°06'E.
Stuart, Maine
Station 72 13.4(13.4 mi. west of 72)
11 Nov. 59
Stuart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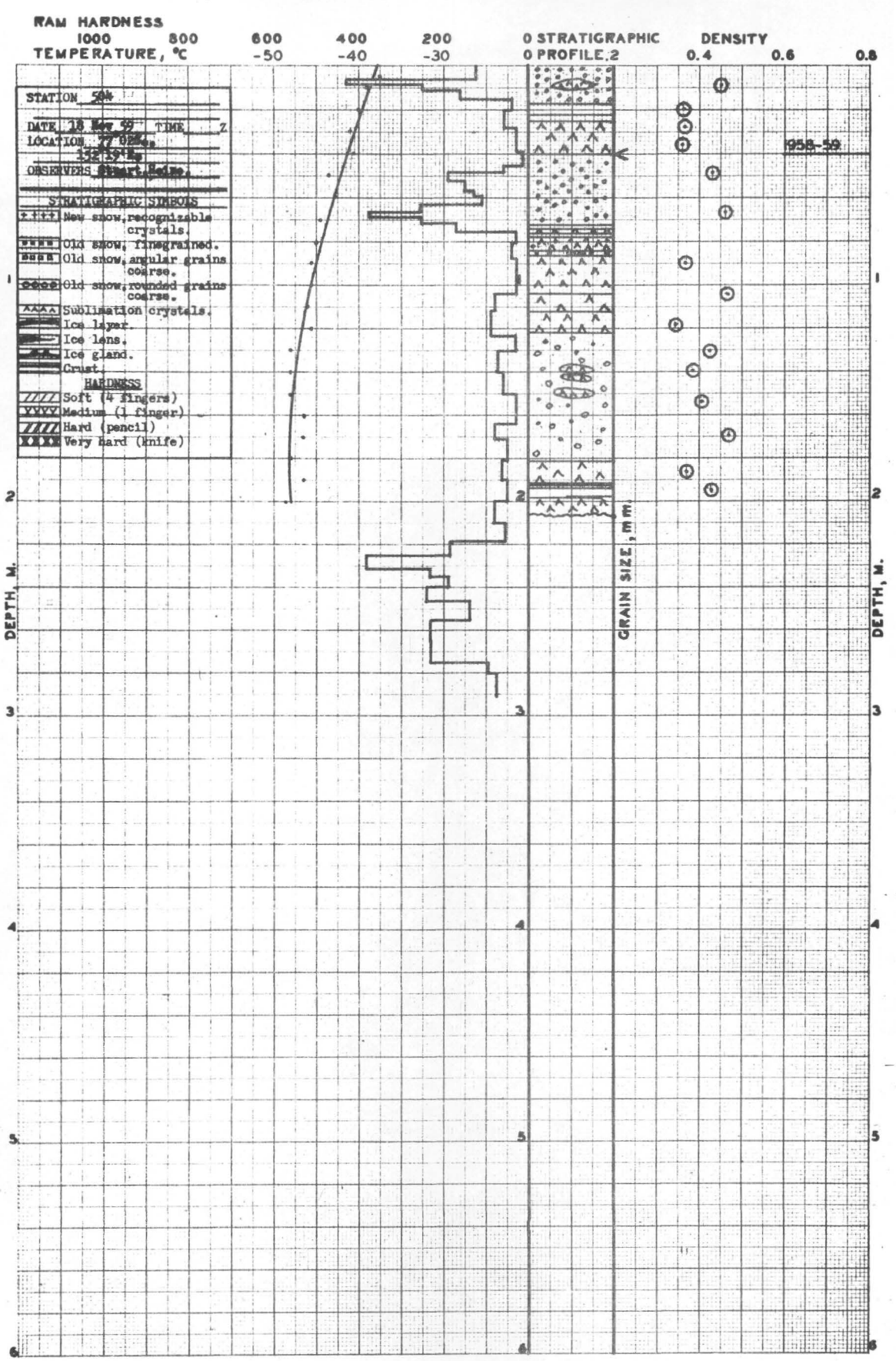
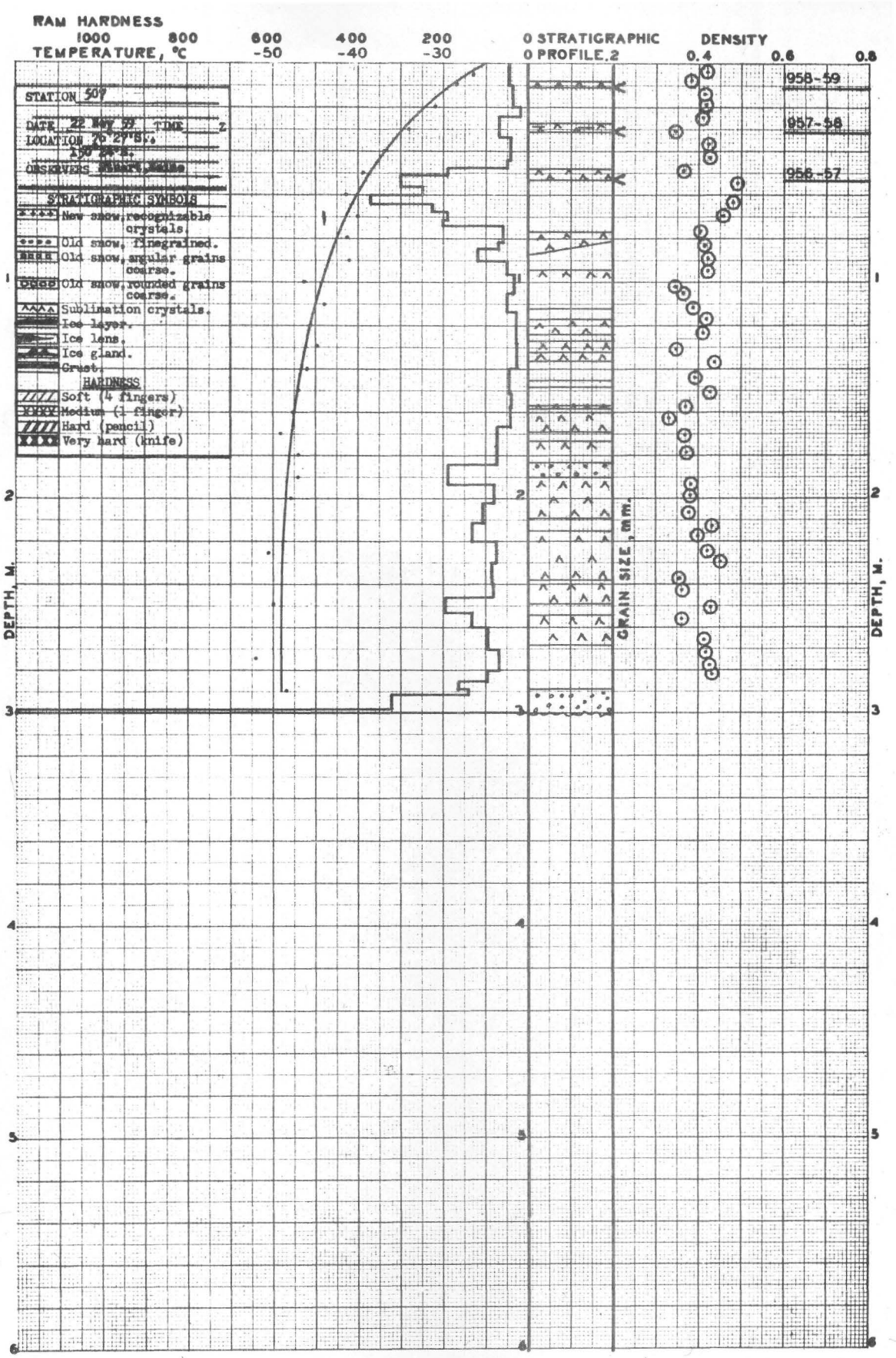
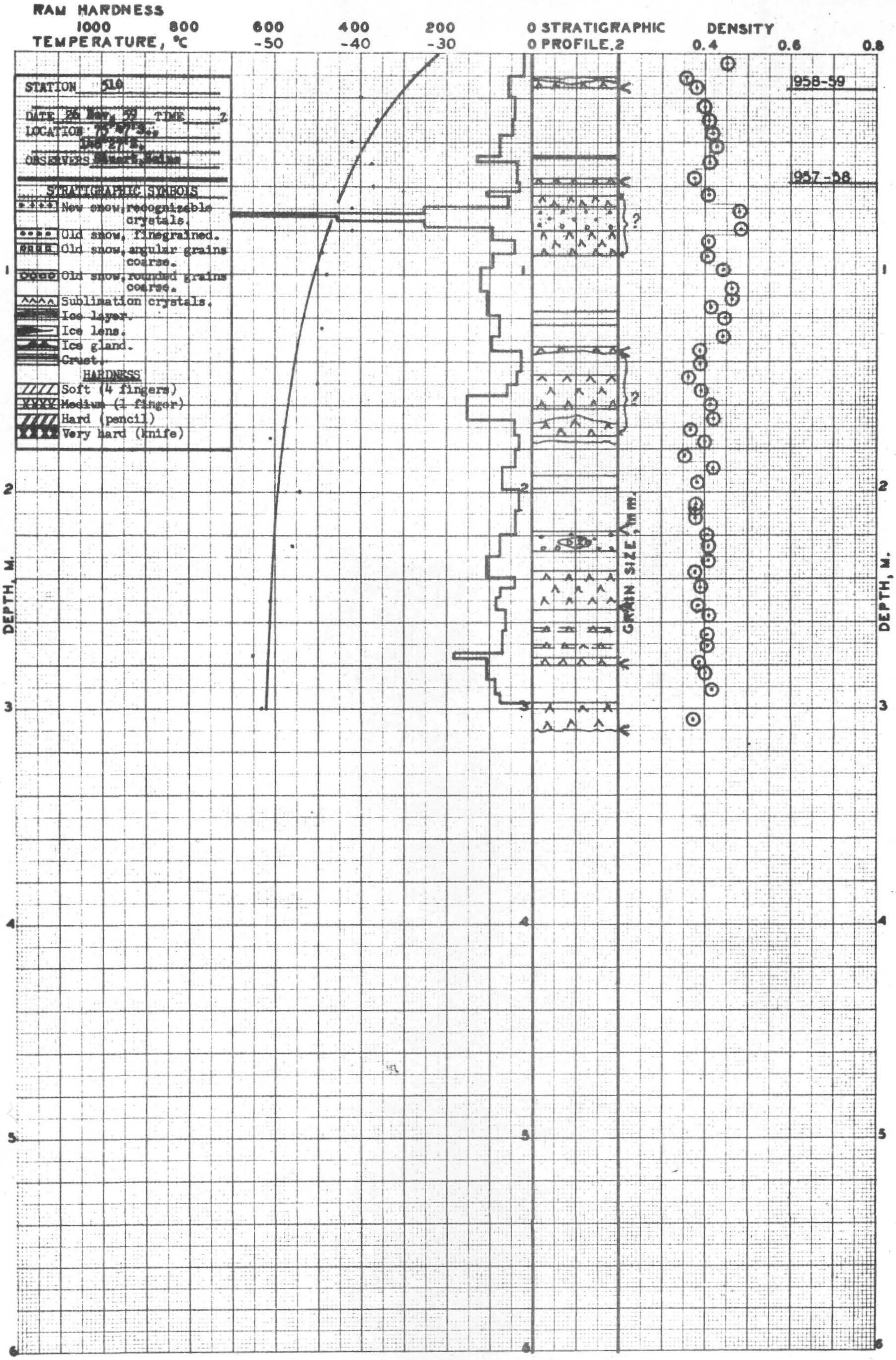
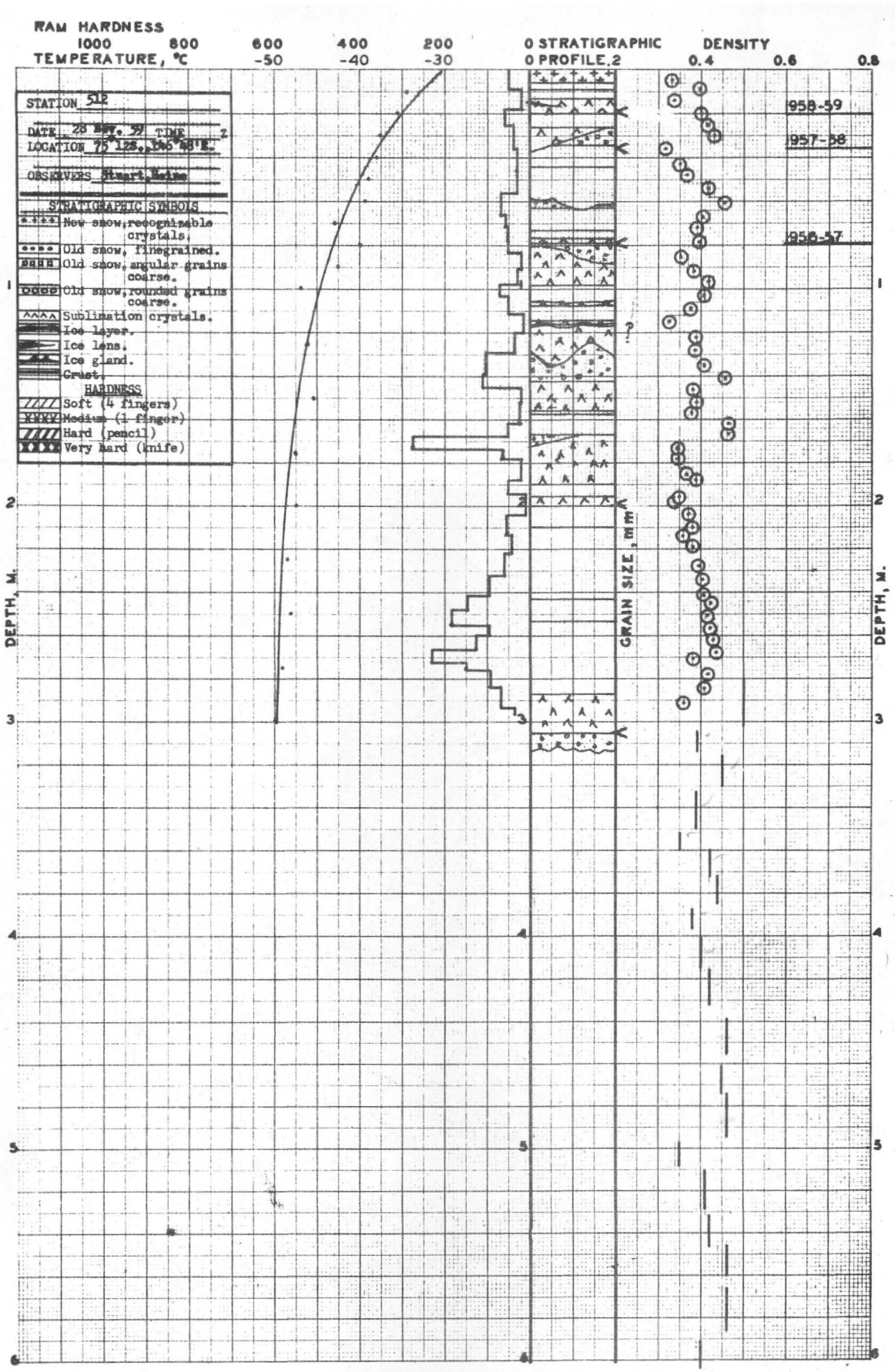
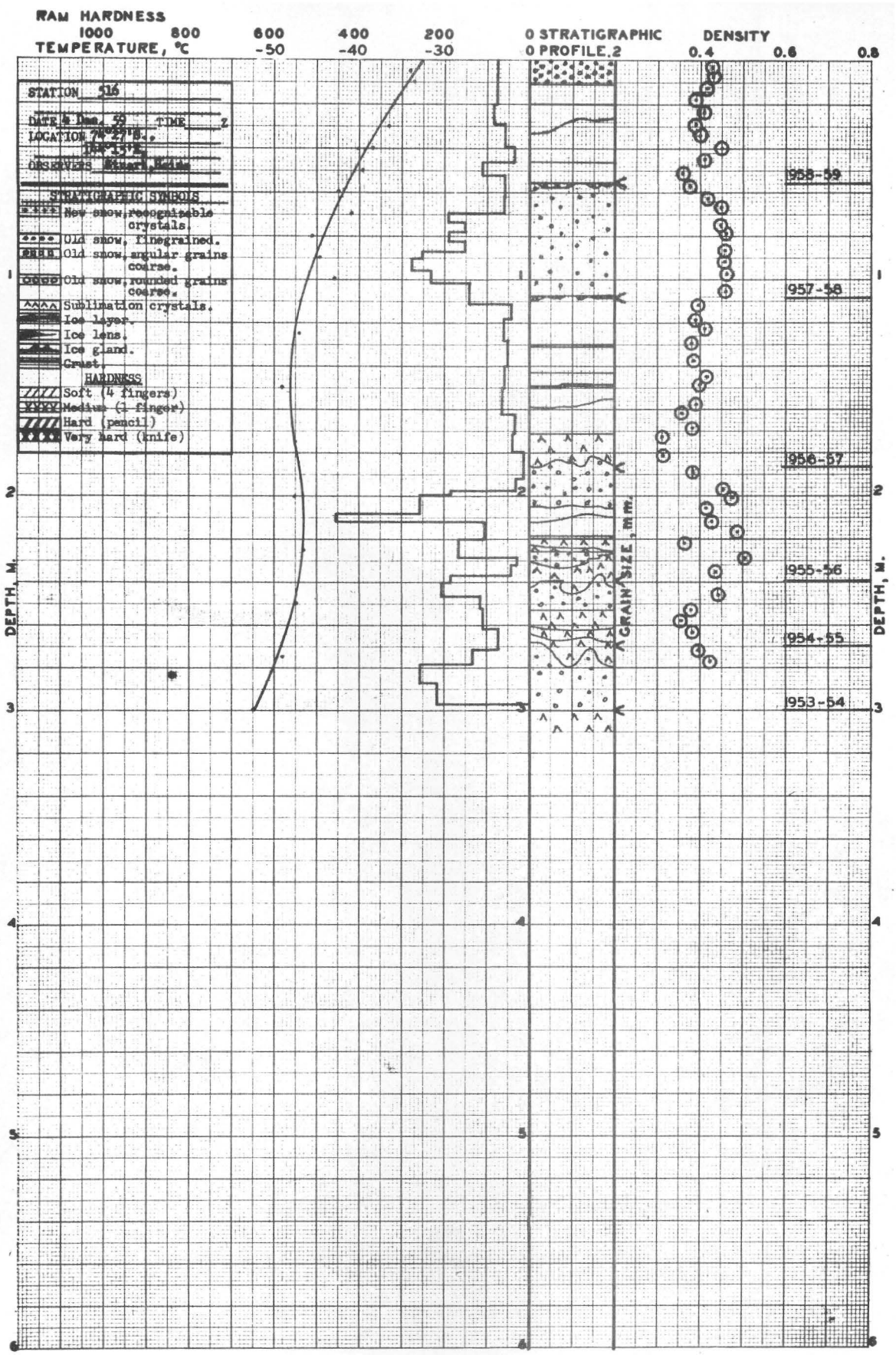
1000 800 600 400 200
TEMPERATURE, °C -50 -40 -30
0 STRATIGRAPHIC
0 PROFILE.2
DENSITY
0.4 0.6 0.8
STATION 502
DATE 15 Nov. '59 TIME Z
LOCATION 77°28'S., 120 06'E
OBSERVERS Stuart, Mains
STRATIGRAPHIC SYMBOLS
New snow, recognizable crystals.
Old snow, finegrained.
Old snow, angular grains coarse.
Old snow, rounded grains coarse.
Sublimation crystals.
Ice layer.
Ice lens.
Ice gland.
Crust.
HARDNESS
Soft (4 fingers)
Medium (1 finger)
Hard (pencil)
Very hard (knife)
1958-59
1957-58
GRAIN SIZE, mm
DEPTH, M.
DEPTH, M.
1
2
3
4
5
6

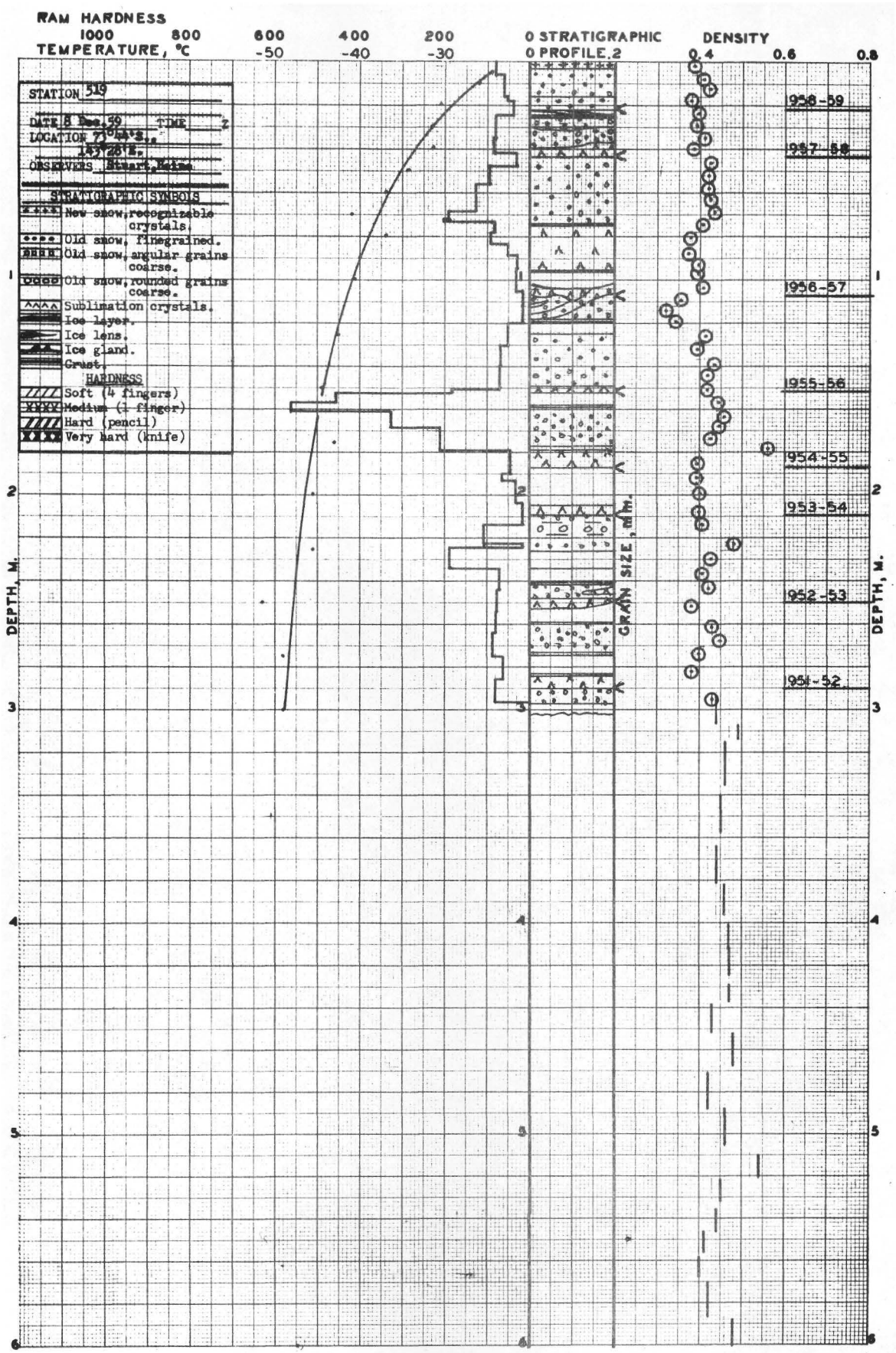

RAM HARDNESS
1000
800
600
400
200
0 STRATIGRAPHIC
DENSITY
TEMPERATURE, °C
-50
-40
-30
0 PROFILE, 2
0.4
0.6
0.8
STATION 504
DATE 18 Mar 59 TIME Z
LOCATION 77°02'N
132°19'E
OBSERVERS Stuart, Heine,
STRATIGRAPHIC SYMBOLS
New snow, recognizable crystals.
Old snow, finegrained.
Old snow, angular grains coarse.
Old snow, rounded grains coarse.
Sublimation crystals.
Ice layer.
Ice lens.
Ice gland.
Crust.
HARDNESS
Soft (4 fingers)
Medium (1 finger)
Hard (pencil)
Very hard (knife)
1958-59
DEPTH, M.
GRAIN SIZE, mm.
DEPTH, M.

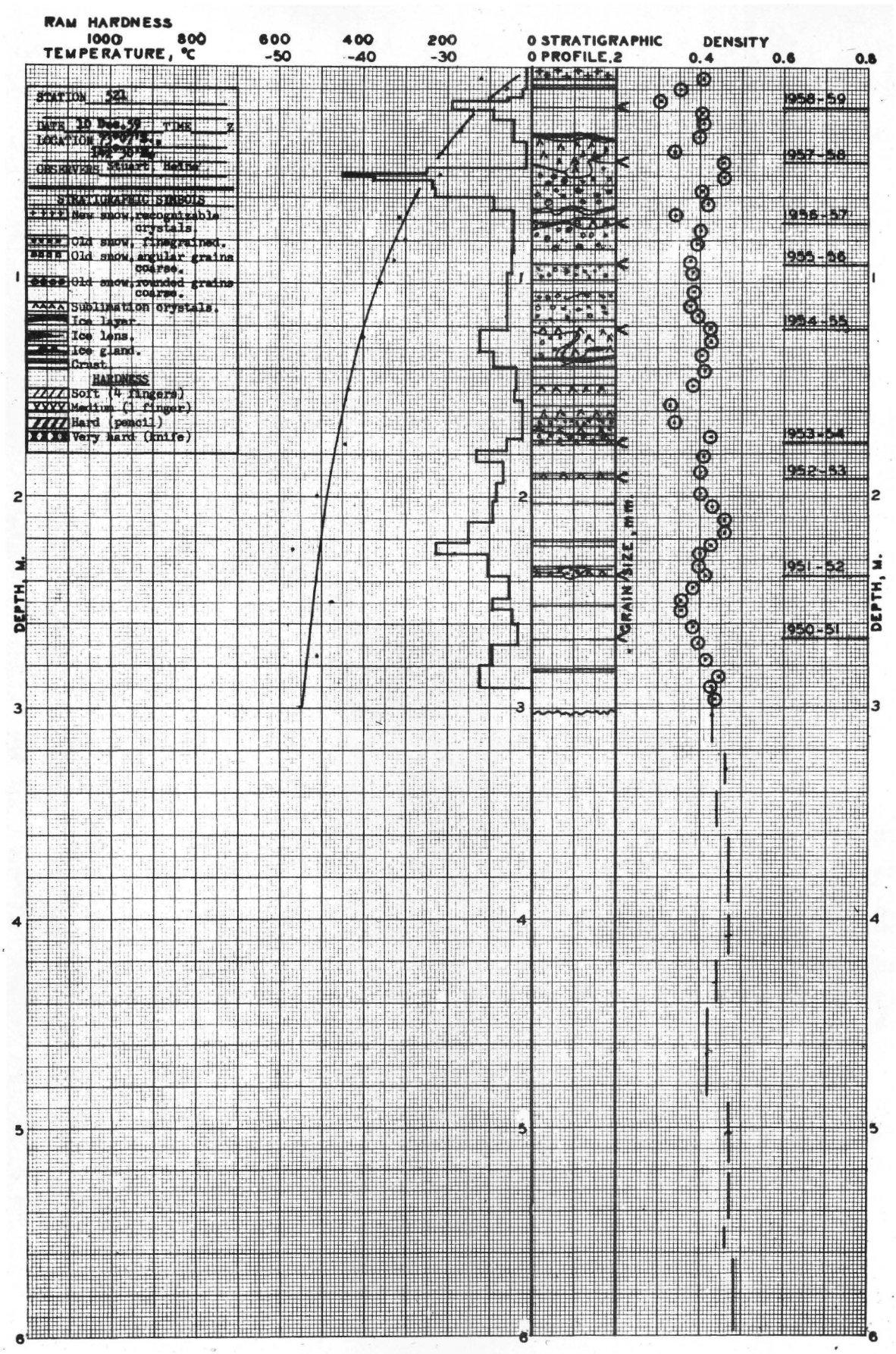

RAM HARDNESS
1000 800
TEMPERATURE, °C
600 400 200
-50 -40 -30
0 STRATIGRAPHIC
0 PROFILE, 2
DENSITY
0.4 0.6 0.8
STATION 507
DATE 22 MAY 59 TIME Z
LOCATION 70 27'S.,
OBSERVERS
STRATIGRAPHIC SYMBOLS
New snow, recognizable crystals
Old snow, finegrained.
Old snow, angular grains coarse.
Old snow, rounded grains coarse.
Sublimation crystals.
Ice layer.
Ice lens.
Ice gland.
Crust.
HARDNESS
Soft (4 fingers)
Medium (1 finger)
Hard (pencil)
Very hard (knife)
958-59
957-58
956-57
DEPTH, M.
GRAIN SIZE, mm.
1
2
3
4
5
6

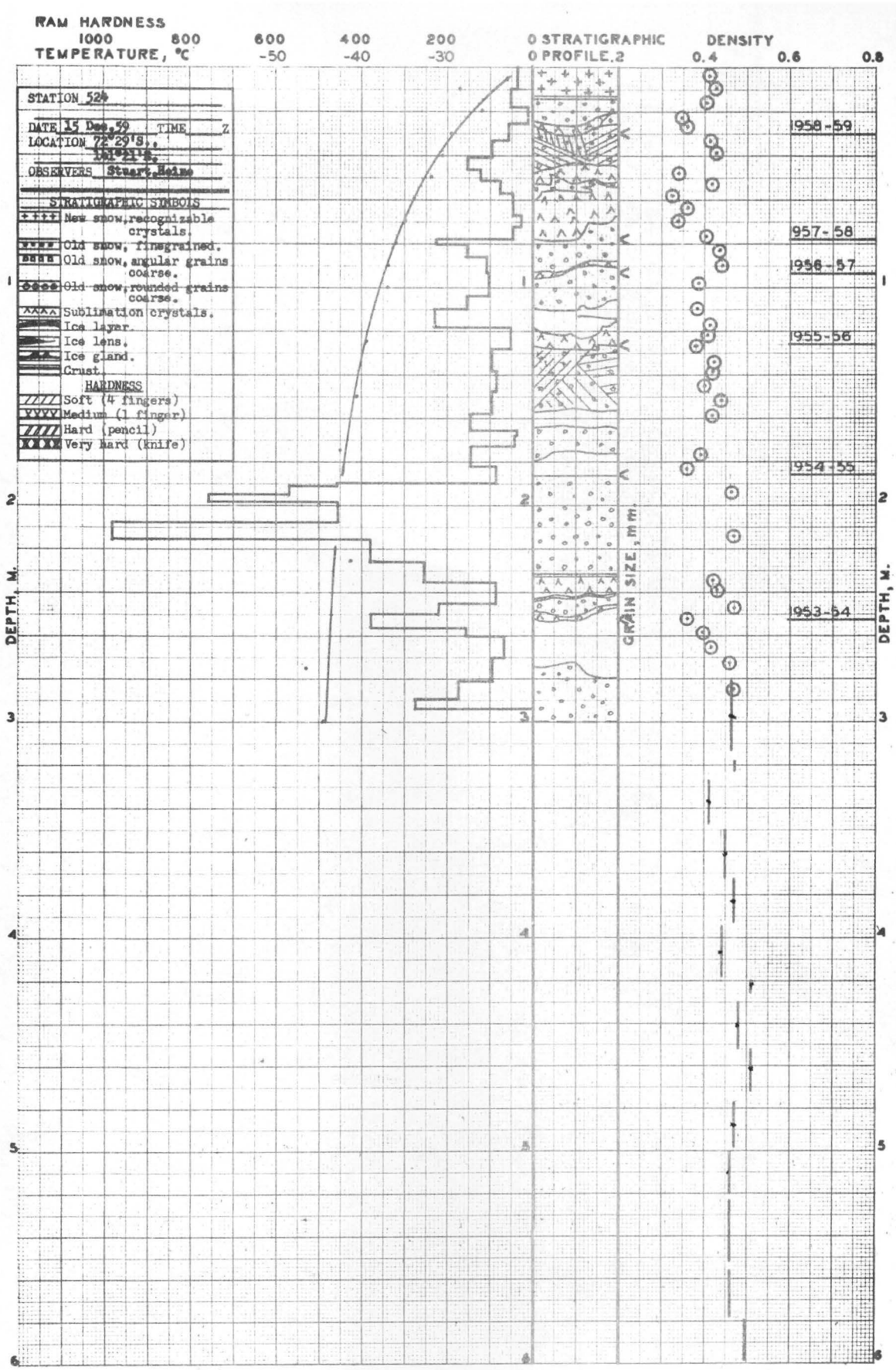

RAM HARDNESS
1000
800
600
400
200
0
TEMPERATURE, °C
-50
-40
-30
0
STRATIGRAPHIC PROFILE
.2
DENSITY
0.4
0.6
0.8
STATION 510
DATE
TIME
LOCATION
OBSERVERS
STRATIGRAPHIC SYMBOLS
New snow, recognizable crystals.
Old snow, finegrained.
Old snow, angular grains coarse.
Old snow, rounded grains coarse.
Sublimation crystals.
Ice layer.
Ice lens.
Ice gland.
Crust.
HARDNESS
Soft (4 fingers)
Medium (1 finger)
Hard (pencil)
Very hard (knife)
1958-59
1957-58
GRAIN SIZE, mm.
DEPTH, M.
1
2
3
4
5
6

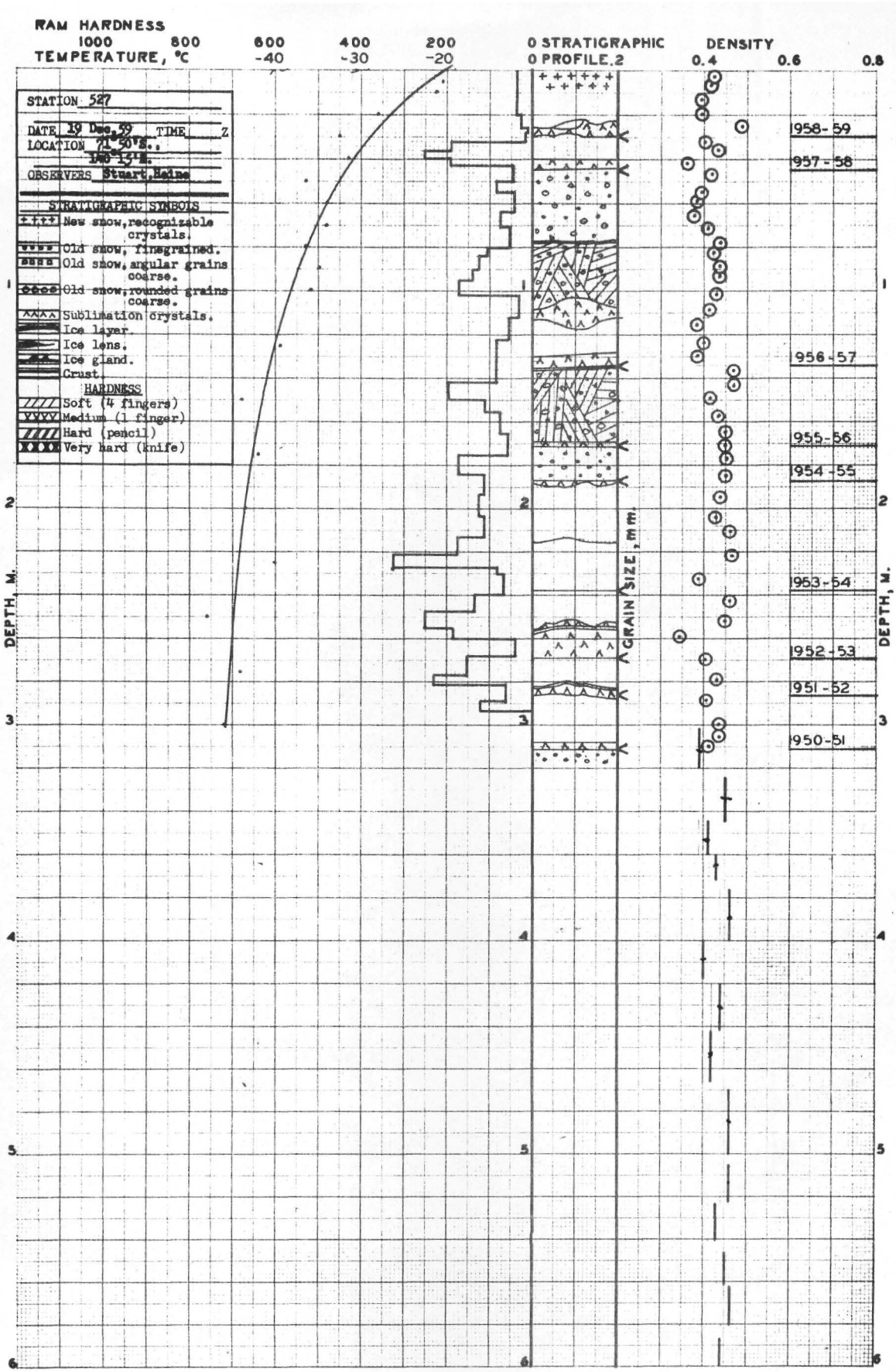

RAM HARDNESS
1000 800 600 400 200
TEMPERATURE, °C -50 -40 -30
0 STRATIGRAPHIC
0 PROFILE, 2
DENSITY
0.4 0.6 0.8
STATION 512
DATE 28 Nov. 59 TIME Z
LOCATION 75 12S., 146 48'E.
OBSERVERS Stuart, Keine
STRATIGRAPHIC SYMBOLS
New snow, recognizable crystals.
Old snow, finegrained.
Old snow, angular grains coarse.
Old snow, rounded grains coarse.
Sublimation crystals.
Ice layer.
Ice lens.
Ice gland.
Crust.
HARDNESS
Soft (4 fingers)
Medium (1 finger)
Hard (pencil)
Very hard (knife)
958-59
957-58
956-57
?
GRAIN SIZE, mm
DEPTH, M.
DEPTH, M.
1
2
3
4
5
6

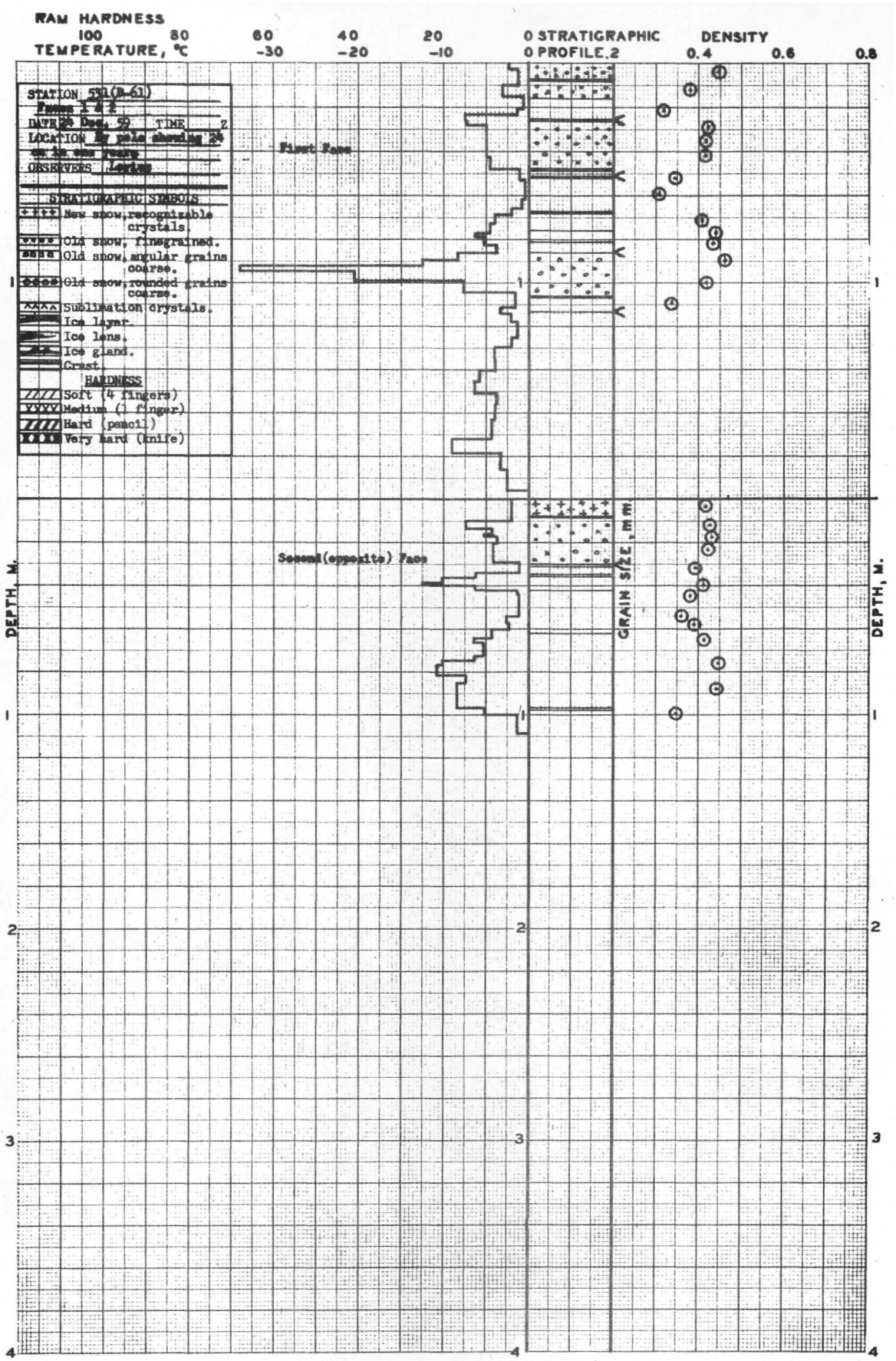

RAM HARDNESS
1000 800 600 400 200
TEMPERATURE, °C -50 -40 -30
0 STRATIGRAPHIC
0 PROFILE 2
DENSITY
0.4 0.6 0.8
STATION 516
DATE 4 Dec. 59 TIME Z
LOCATION 78°27'S.,
168°15'E.
OBSERVERS Stuart, Weeks
STRATIGRAPHIC SYMBOLS
New snow, recognizable crystals.
Old snow, finegrained.
Old snow, angular grains coarse.
Old snow, rounded grains coarse.
Sublimation crystals.
Ice layer.
Ice lens.
Ice gland.
Crust.
HARDNESS
Soft (4 fingers)
Medium (1 finger)
Hard (pencil)
Very hard (knife)
958-59
957-58
956-57
955-56
954-55
953-54
DEPTH, M.
GRAIN SIZE, mm.

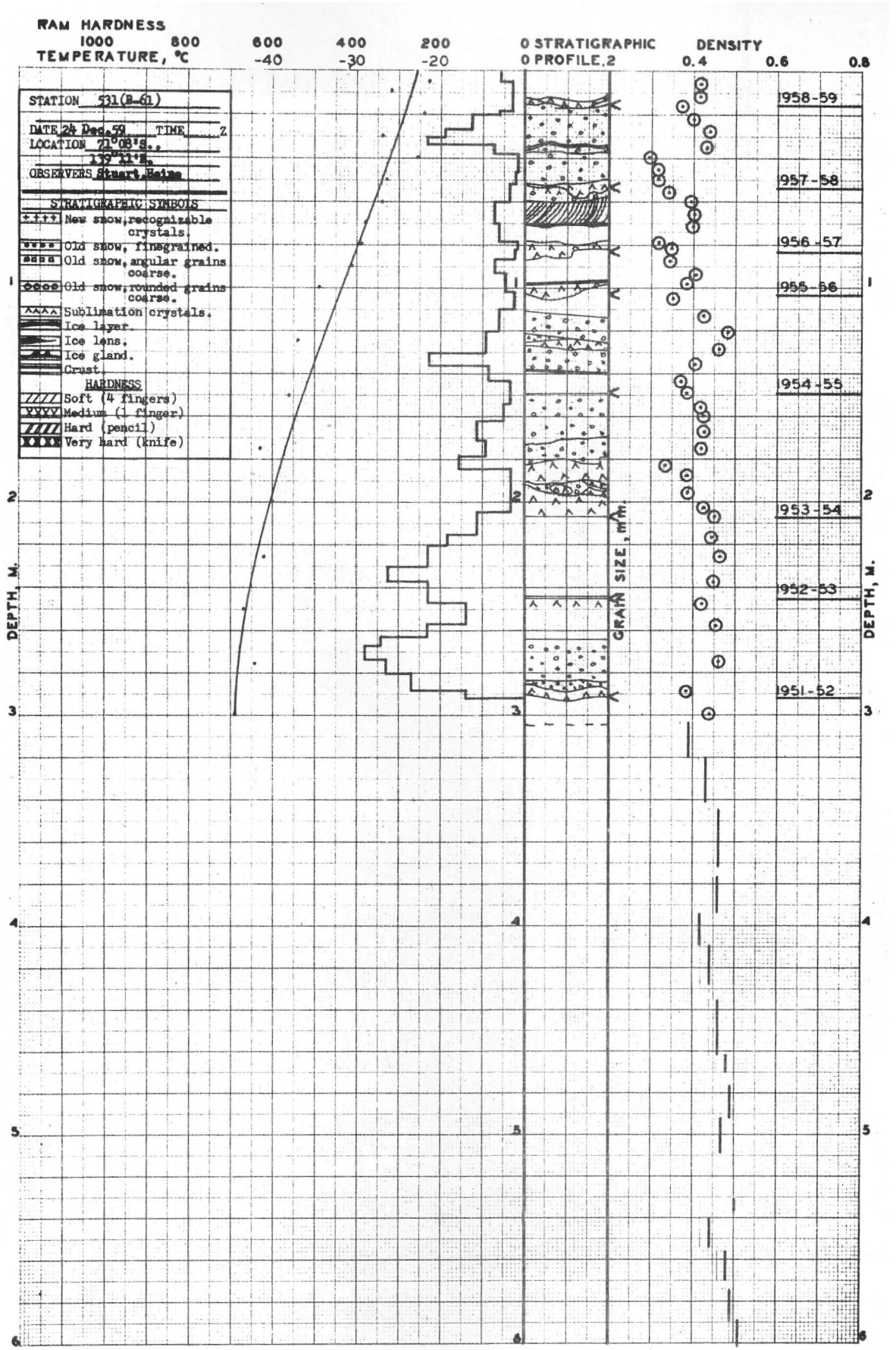

RAM HARDNESS
1000 800 600 400 200 0
TEMPERATURE, °C -50 -40 -30
0 STRATIGRAPHIC PROFILE, 2
DENSITY 0.4 0.6 0.8
STATION 519
DATE 8 Dec. 59 TIME Z
LOCATION 71°44'S., 145°28'E.
OBSERVERS Stuart, Kaine
STRATIGRAPHIC SYMBOLS
New snow, recognizable crystals.
Old snow, fine grained.
Old snow, angular grains coarse.
Old snow, rounded grains coarse.
Sublimation crystals.
Ice layer.
Ice lens.
Ice gland.
Crust.
HARDNESS
Soft (4 fingers)
Medium (1 finger)
Hard (pencil)
Very hard (knife)
1958-59
1957-58
1956-57
1955-56
1954-55
1953-54
1952-53
1951-52
GRAIN SIZE, mm.
DEPTH, M.
DEPTH, M.
0
1
2
3
4
5
6

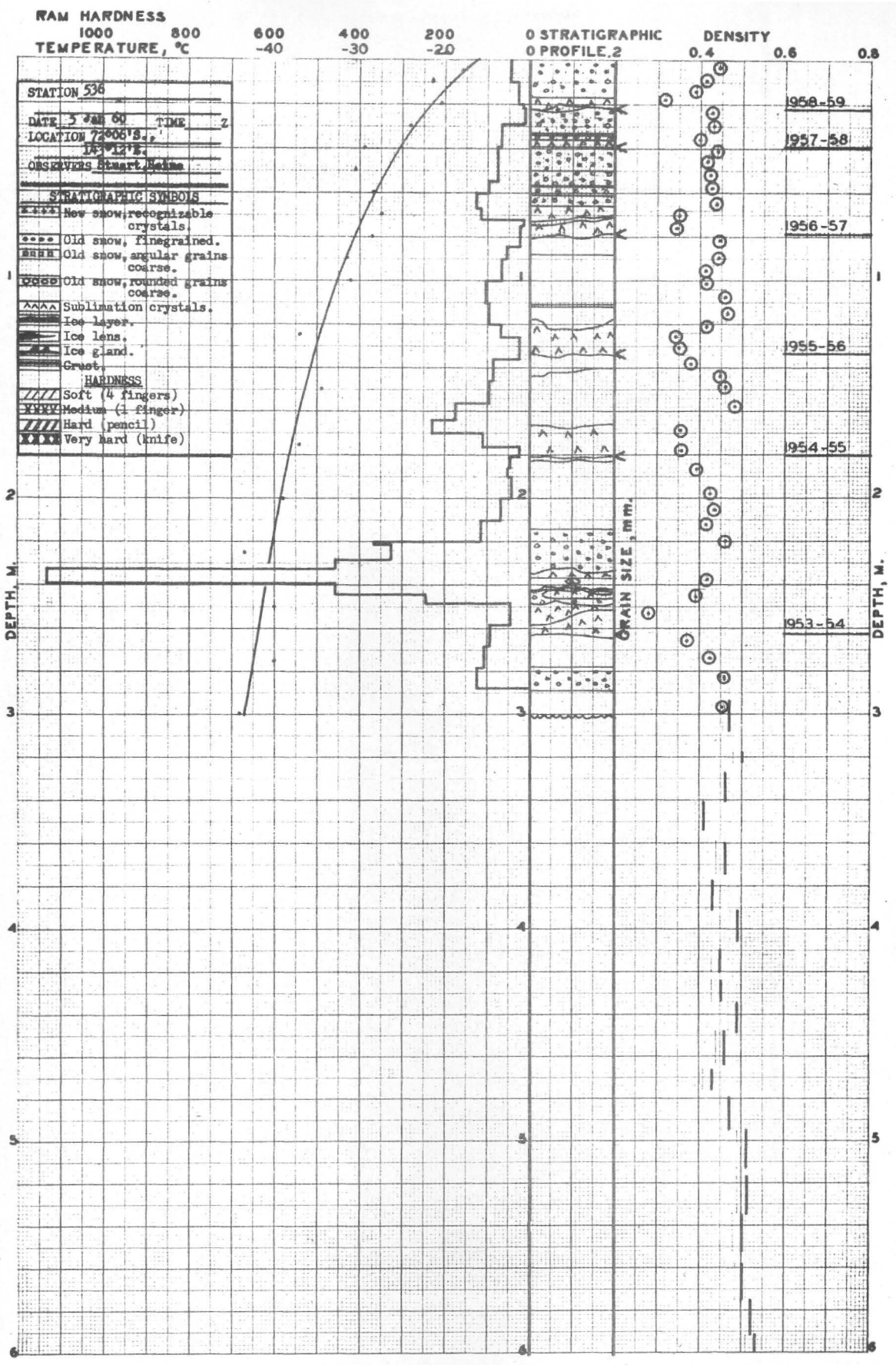

RAM HARDNESS
1000 800 600 400 200
TEMPERATURE, °C -50 -40 -30
0 STRATIGRAPHIC
0 PROFILE.2
DENSITY
0.4 0.6 0.8
STATION 521
DATE 10 Dec.58 TIME Z
OBSERVERS Stuart, Heine
STRATIGRAPHIC SYMBOLS
New snow, recognizable crystals.
Old snow, finegrained.
Old snow, angular grains coarse.
Old snow, rounded grains coarse.
Sublimation crystals.
Ice layer.
Ice lens.
Ice gland.
Crust.
HARDNESS
Soft (4 fingers)
Medium (1 finger)
Hard (pencil)
Very hard (knife)
1958-59
1957-58
1956-57
1955-56
1954-55
1953-54
1952-53
1951-52
1950-51
GRAIN SIZE, mm.
DEPTH, M.
DEPTH, M.
0
1
2
3
4
5
6

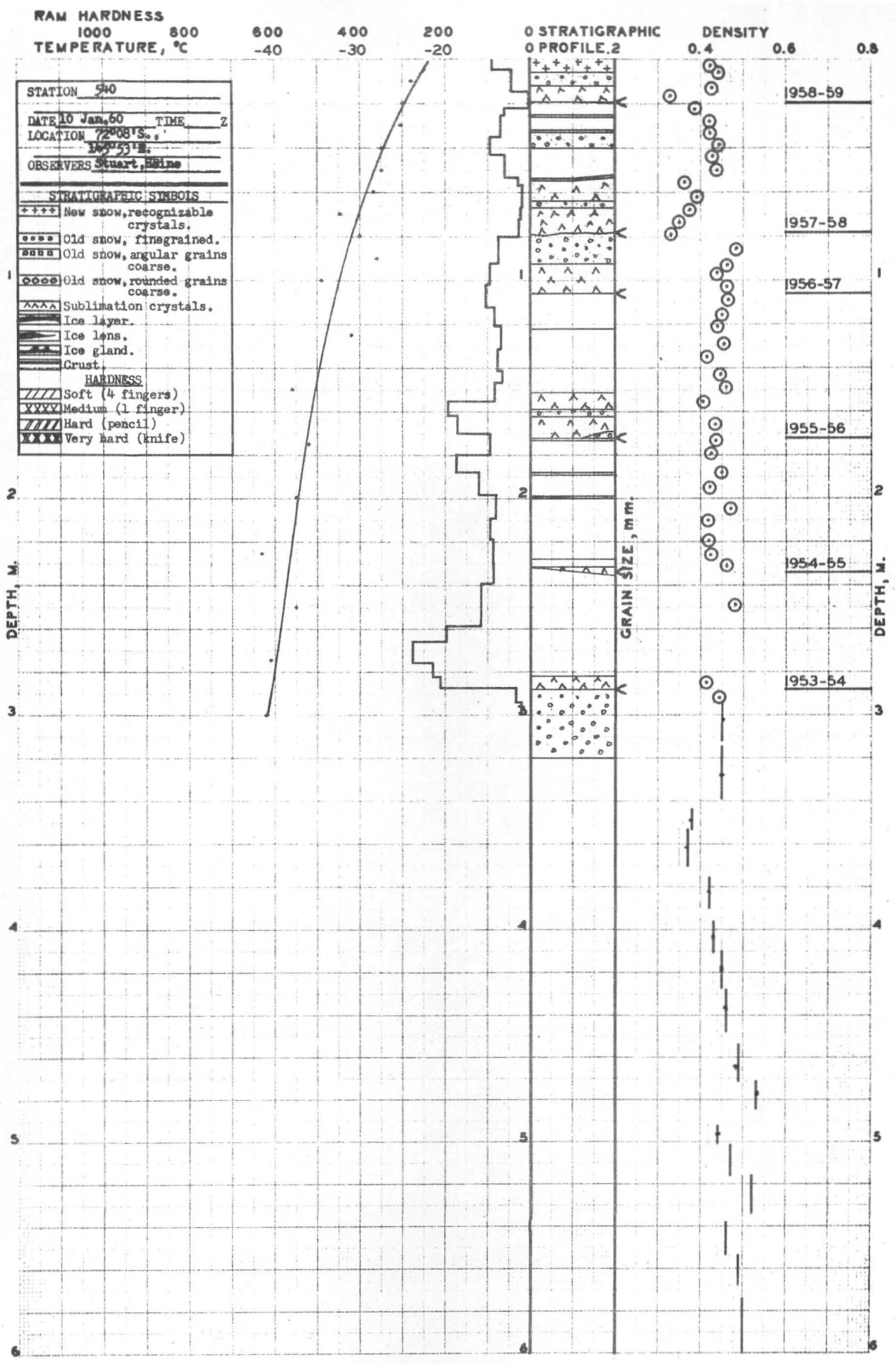

RAM HARDNESS
1000 800 600 400 200 0
TEMPERATURE, °C -50 -40 -30
STRATIGRAPHIC PROFILE.2
DENSITY
0.4 0.6 0.8
STATION 524
DATE 15 Dec.59 TIME Z
LOCATION 72°29'S.,
OBSERVERS Stuart, Heine
STRATIGRAPHIC SYMBOLS
New snow, recognizable crystals.
Old snow, finegrained.
Old snow, angular grains coarse.
Old snow, rounded grains coarse.
Sublimation crystals.
Ice layer.
Ice lens.
Ice gland.
Crust.
HARDNESS
Soft (4 fingers)
Medium (1 finger)
Hard (pencil)
Very hard (knife)
1958-59
1957-58
1956-57
1955-56
1954-55
1953-54
GRAIN SIZE, mm.
DEPTH, M.
DEPTH, M.

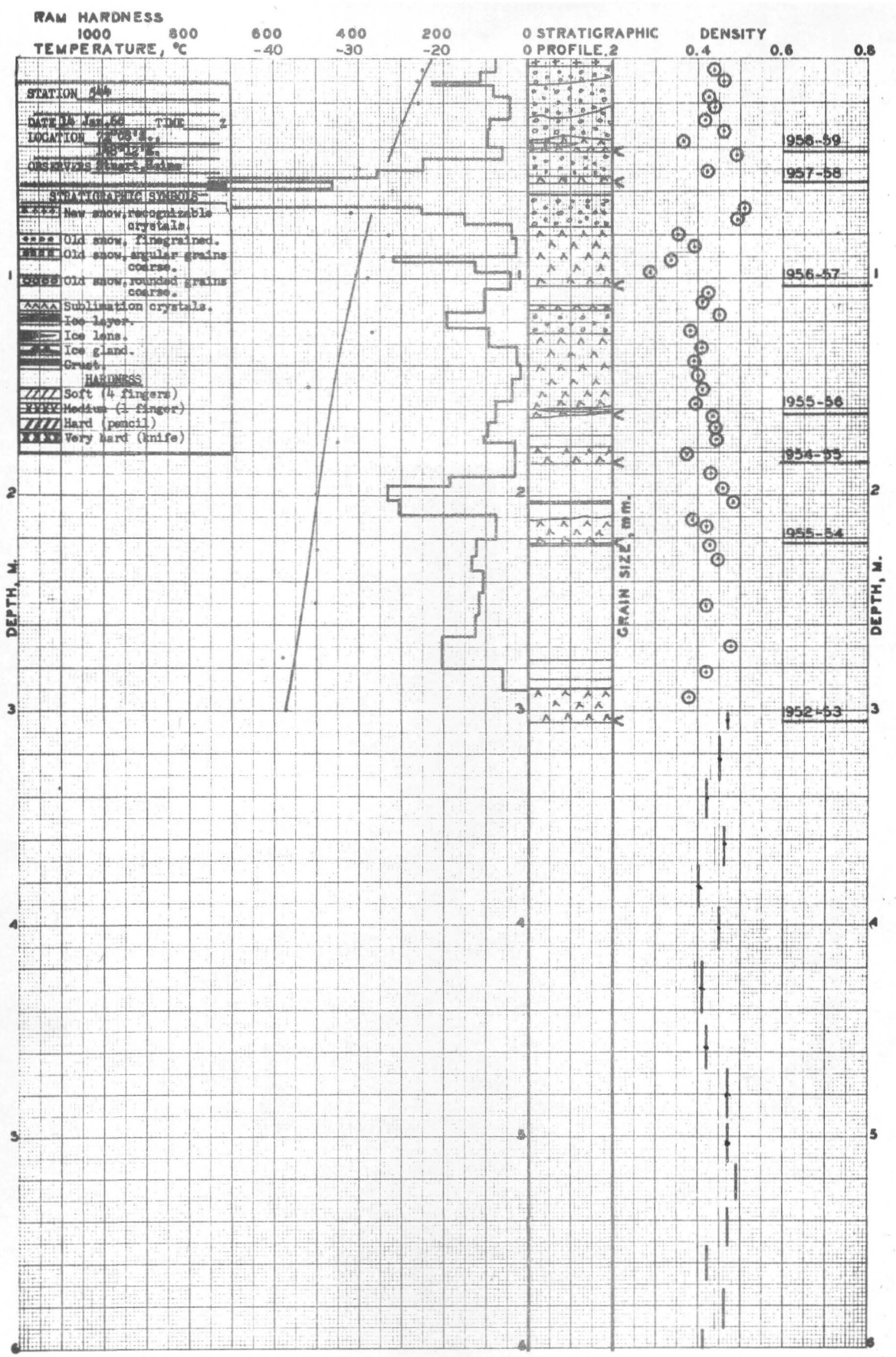

RAM HARDNESS
1000 800 600 400 200
TEMPERATURE, °C -40 -30 -20
0 STRATIGRAPHIC
0 PROFILE.2
DENSITY
0.4 0.6 0.8
STATION 527
DATE 19 Dec.59 TIME Z
LOCATION 71°50'S.
160°15'E.
OBSERVERS Stuart,Heine
STRATIGRAPHIC SYMBOLS
New snow, recognizable crystals.
Old snow, finegrained.
Old snow, angular grains coarse.
Old snow, rounded grains coarse.
Sublimation crystals.
Ice layer.
Ice lens.
Ice gland.
Crust.
HARDNESS
Soft (4 fingers)
Medium (1 finger)
Hard (pencil)
Very hard (knife)
1958-59
1957-58
1956-57
1955-56
1954-55
1953-54
1952-53
1951-52
1950-51
GRAIN SIZE, mm.
DEPTH, M.
DEPTH, M.

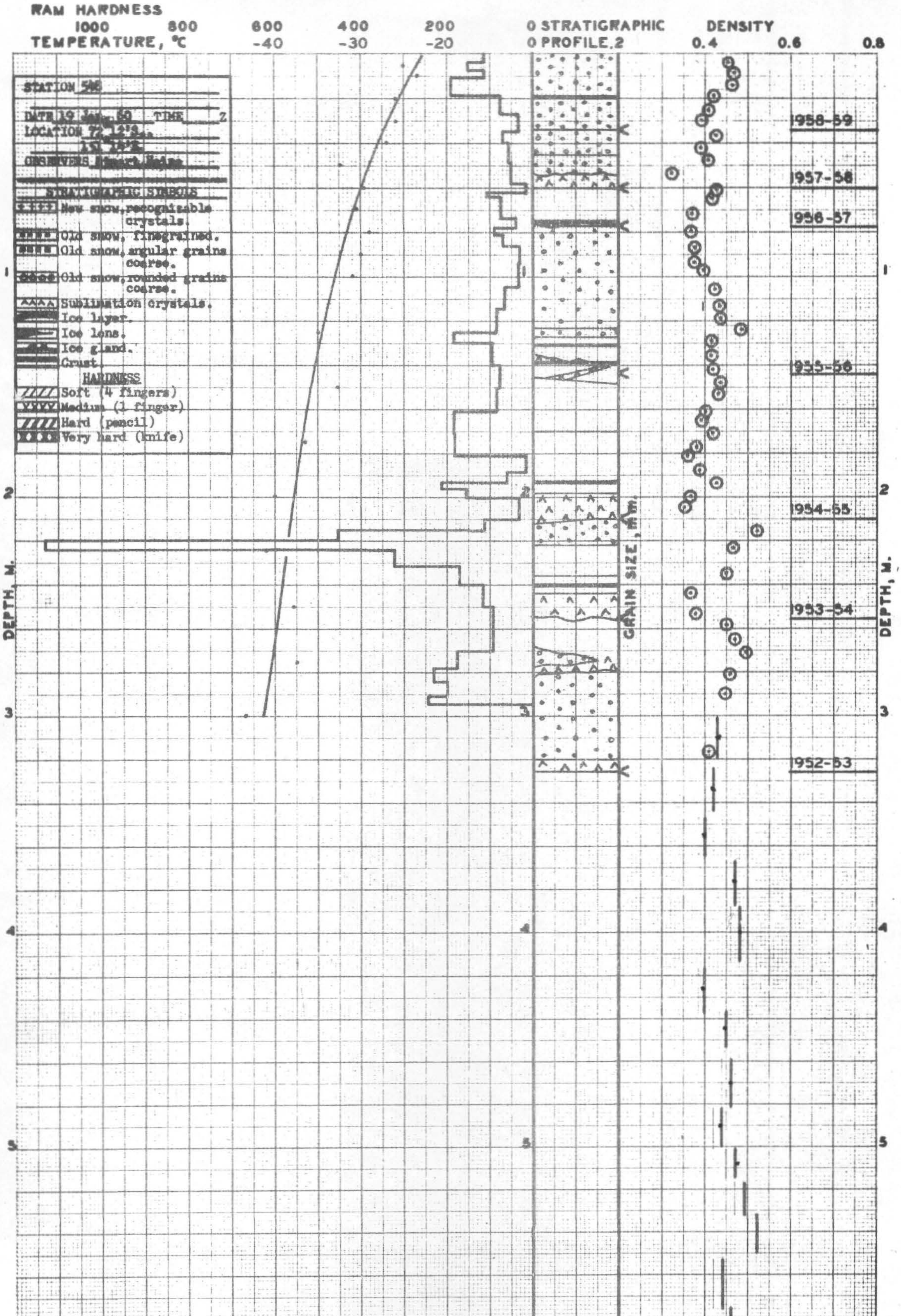

RAM HARDNESS
100 80
TEMPERATURE, °C
60 40 20
-30 -20 -10
0 STRATIGRAPHIC
0 PROFILE, 2
DENSITY
0.4 0.6 0.8
STATION 551(B-61)
Pass 1 & 2
DATE 24 Dec. 59 TIME Z
LOCATION By pole showing 24 as in one year
OBSERVERS Lerdahl
STRATIGRAPHIC SYMBOLS
New snow, recognizable crystals.
Old snow, fine grained.
Old snow, angular grains coarse.
Old snow, rounded grains coarse.
Sublimation crystals.
Ice layer.
Ice lens.
Ice gland.
Crust.
HARDNESS
Soft (4 fingers)
Medium (1 finger)
Hard (pencil)
Very hard (knife)
First Face
Second (opposite) Face
GRAIN SIZE, mm
DEPTH, M.
DEPTH, M.
1
2
3
4

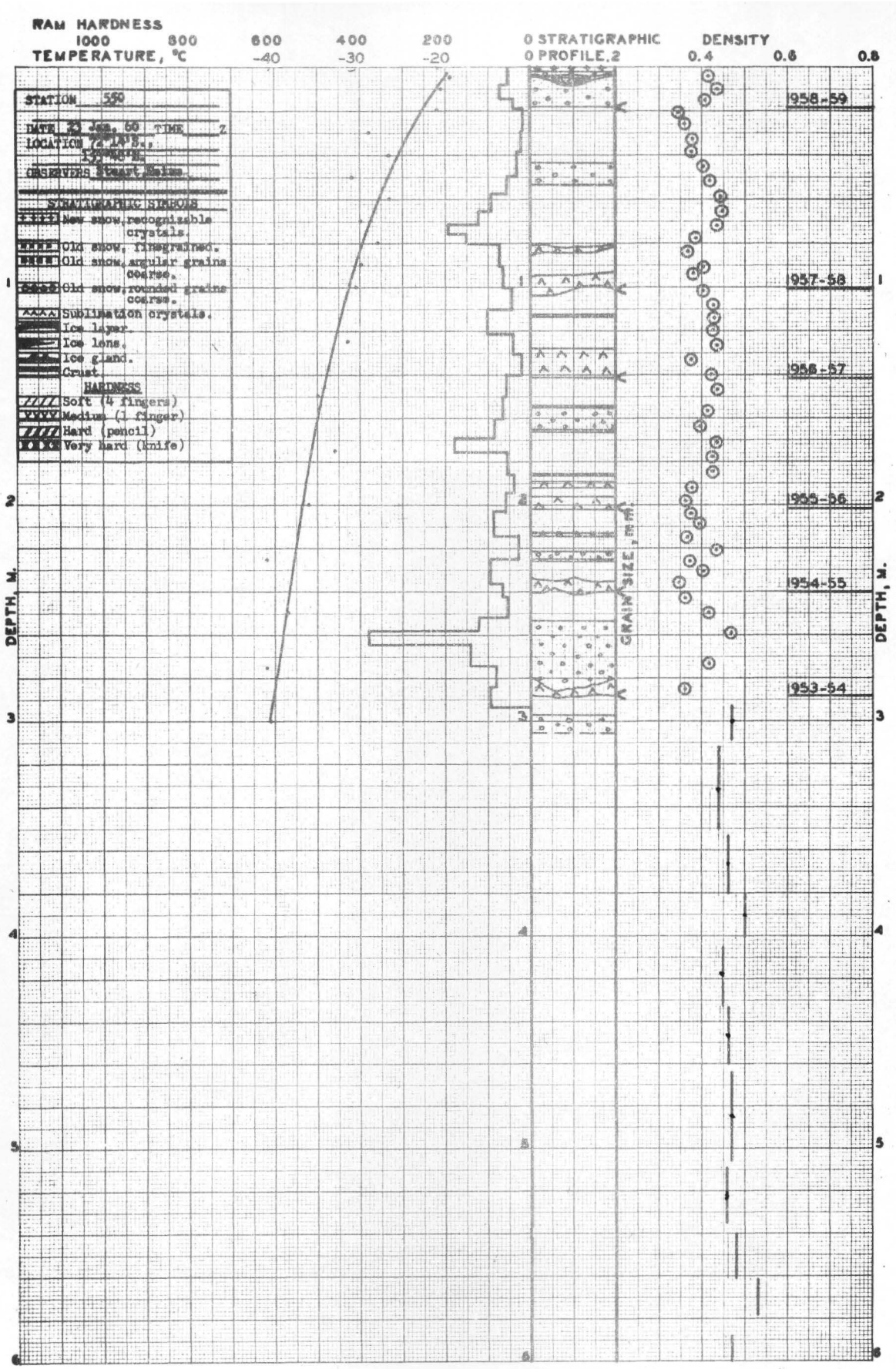

RAM HARDNESS
1000
800
TEMPERATURE, °C
600
-40
400
-30
200
-20
0 STRATIGRAPHIC
0 PROFILE, 2
DENSITY
0.4
0.6
0.8
STATION 531(B-61)
DATE 24 Dec. 59 TIME Z
LOCATION 71°08'S., 139°11'E.
OBSERVERS Stuart, Heine
STRATIGRAPHIC SYMBOLS
New snow, recognizable crystals.
Old snow, finegrained.
Old snow, angular grains coarse.
Old snow, rounded grains coarse.
Sublimation crystals.
Ice layer.
Ice lens.
Ice gland.
Crust.
HARDNESS
Soft (4 fingers)
Medium (1 finger)
Hard (pencil)
Very hard (knife)
1958-59
1957-58
1956-57
1955-56
1954-55
1953-54
1952-53
1951-52
DEPTH, M.
GRAIN SIZE, m/m.
DEPTH, M.

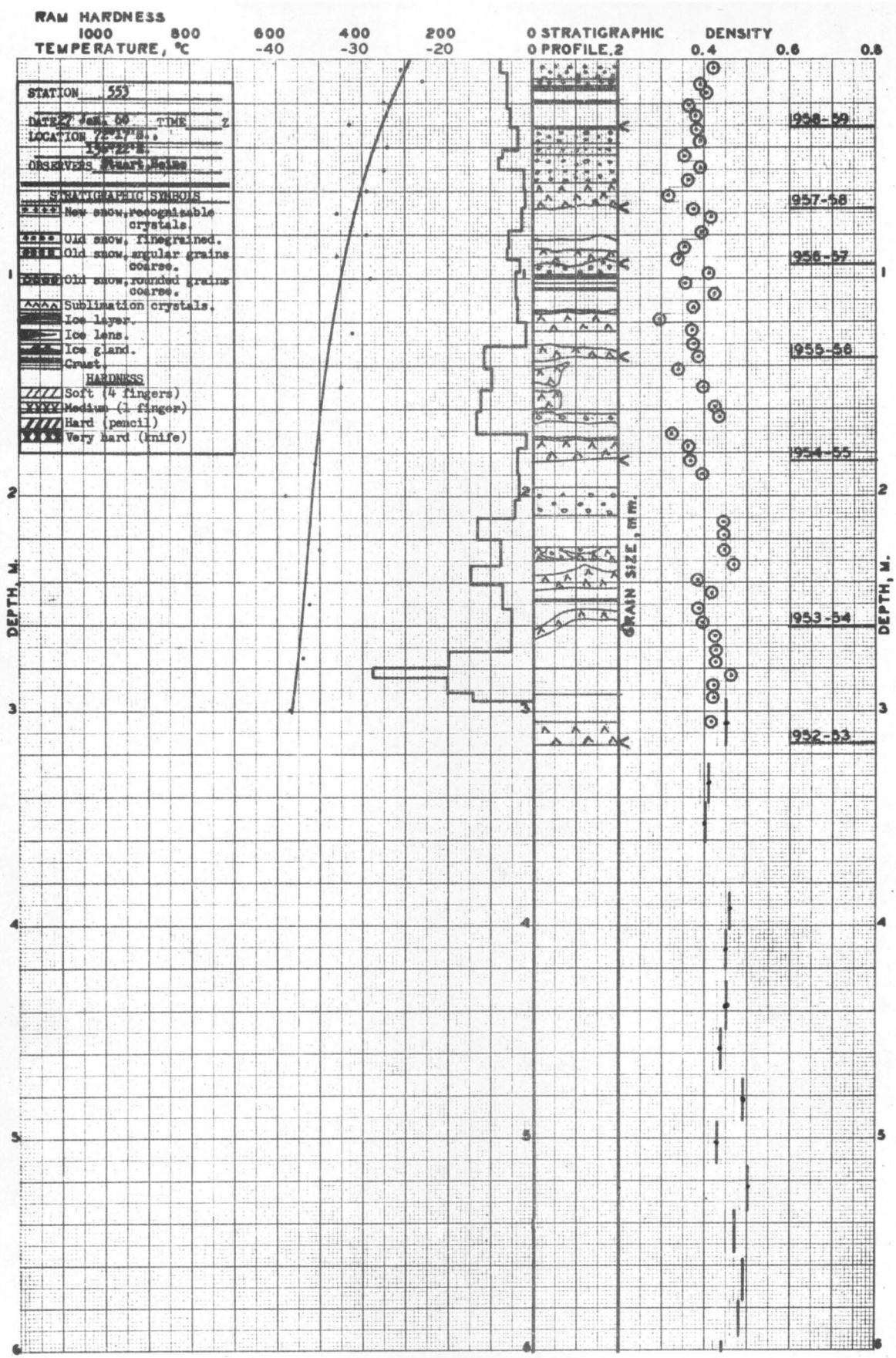

RAM HARDNESS
1000 800
TEMPERATURE, °C
600 400 200
-40 -30 -20
0 STRATIGRAPHIC
0 PROFILE, 2
DENSITY
0.4 0.6 0.8
STATION 536
DATE 5 AUG 60 TIME Z
LOCATION 72°06'S.,
143°12'E.
OBSERVERS Stuart Weims
STRATIGRAPHIC SYMBOLS
New snow, recognizable crystals.
Old snow, finegrained.
Old snow, angular grains coarse.
Old snow, rounded grains coarse.
Sublimation crystals.
Ice layer.
Ice lens.
Ice gland.
Crust.
HARDNESS
Soft (4 fingers)
Medium (1 finger)
Hard (pencil)
Very hard (knife)
1958-59
1957-58
1956-57
1955-56
1954-55
1953-54
GRAIN SIZE, mm.
DEPTH, M.
DEPTH, M.
1
2
3
4
5
6

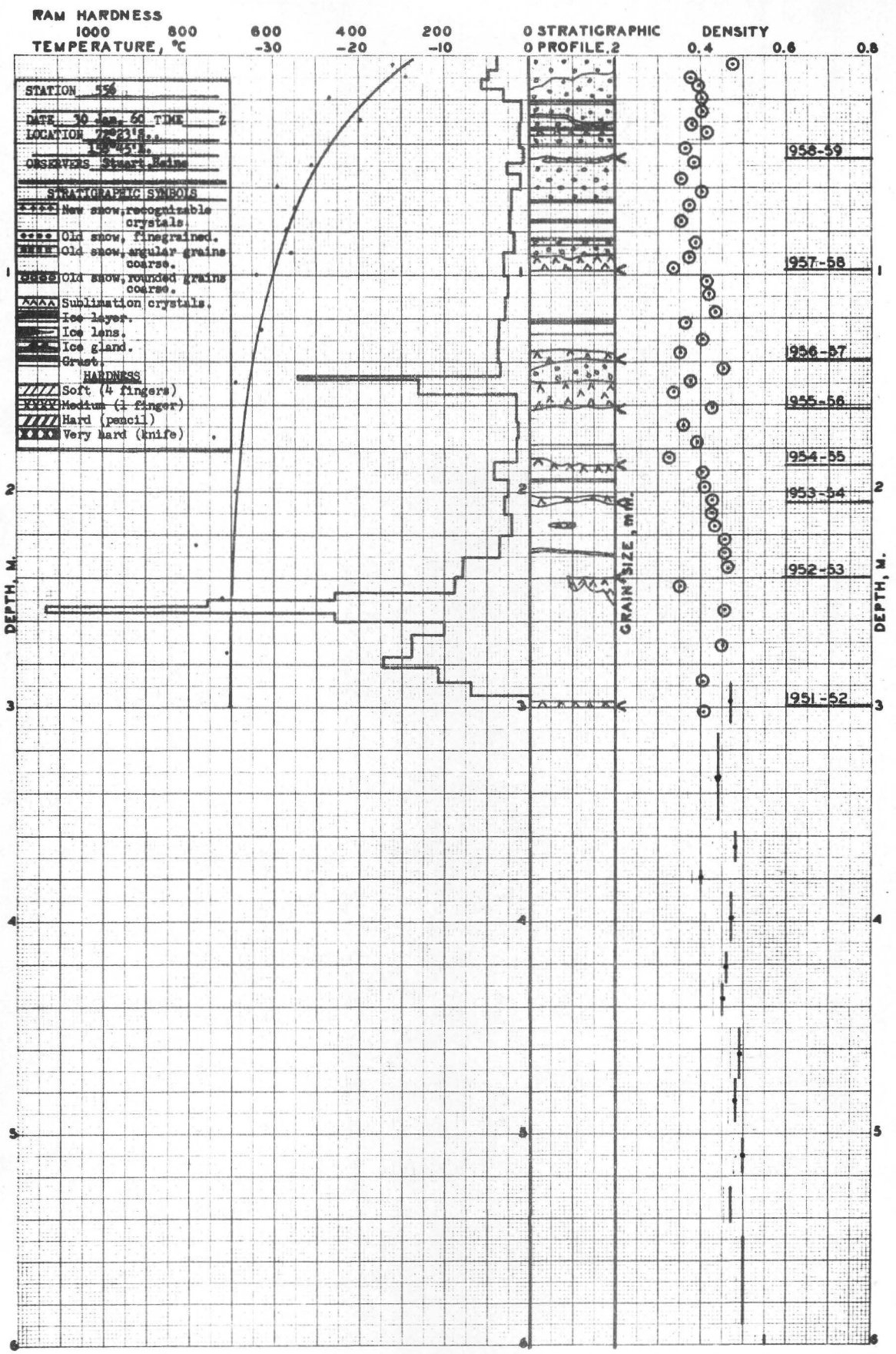

RAM HARDNESS
1000 800 600 400 200
TEMPERATURE, °C -40 -30 -20
0 STRATIGRAPHIC 0 PROFILE, 2
DENSITY 0.4 0.6 0.8
STATION 540
DATE 10 Jan. 60 TIME Z
LOCATION 72°08'S., 165°53'E.
OBSERVERS Stuart, Kline
STRATIGRAPHIC SYMBOLS
New snow, recognizable crystals.
Old snow, finegrained.
Old snow, angular grains coarse.
Old snow, rounded grains coarse.
Sublimation crystals.
Ice layer.
Ice lens.
Ice gland.
Crust.
HARDNESS
Soft (4 fingers)
Medium (1 finger)
Hard (pencil)
Very hard (knife)
1958-59
1957-58
1956-57
1955-56
1954-55
1953-54
DEPTH, M.
GRAIN SIZE, mm.
1
2
3
4
5
6

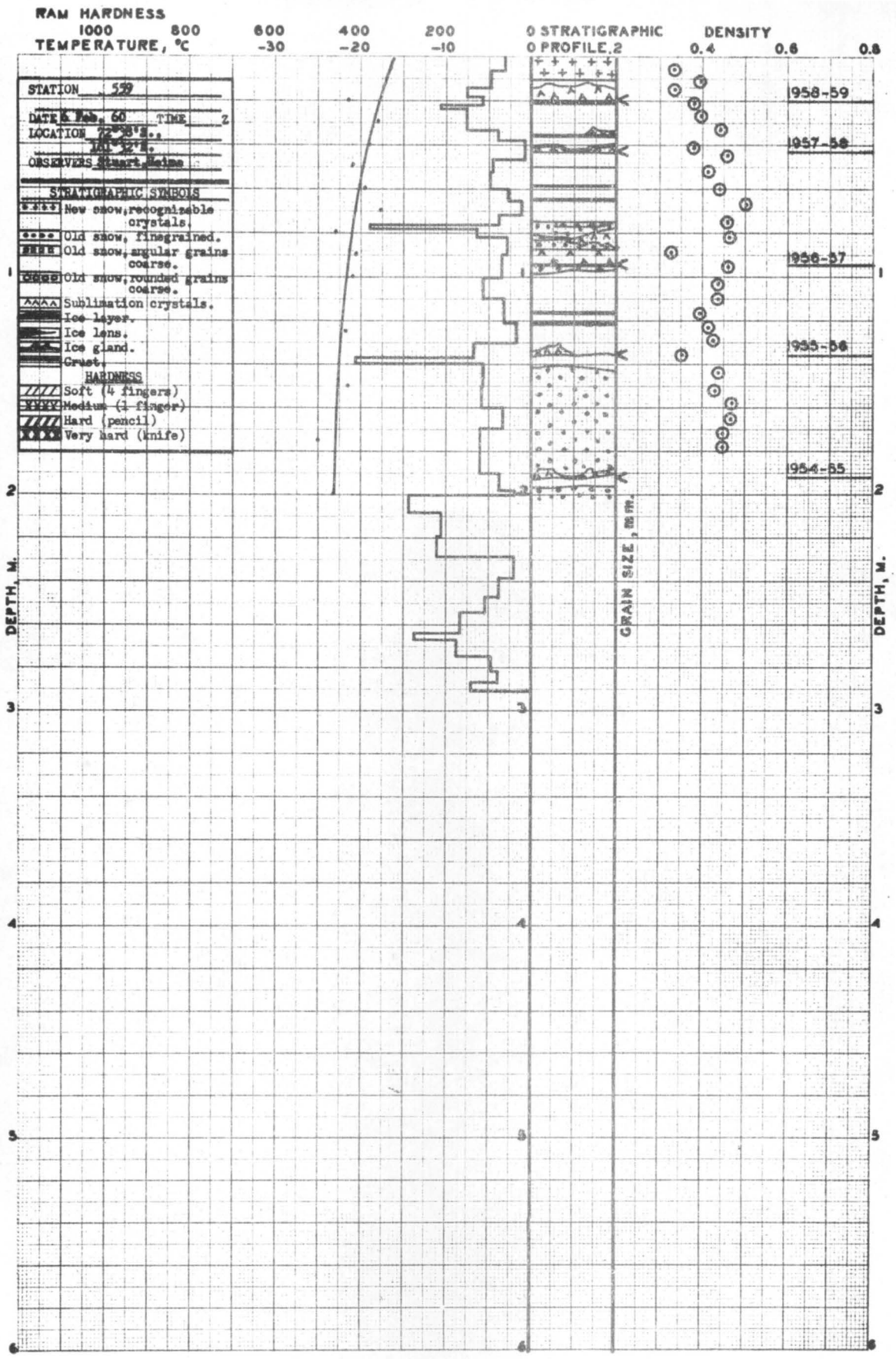

RAM HARDNESS
1000
800
600
400
200
TEMPERATURE, °C
-40
-30
-20
0 STRATIGRAPHIC
0 PROFILE 2
DENSITY
0.4
0.6
0.8
STATION
DATE 24 Jan. 50 TIME 2
LOCATION
OBSERVERS Stuart Holmes
STRATIGRAPHIC SYMBOLS
New snow, recognizable crystals.
Old snow, finegrained.
Old snow, angular grains coarse.
Old snow, rounded grains coarse.
Sublimation crystals.
Ice layer.
Ice lens.
Ice gland.
Crust.
HARDNESS
Soft (4 fingers)
Medium (1 finger)
Hard (pencil)
Very hard (knife)
956-59
957-58
956-57
955-56
954-55
955-54
952-53
GRAIN SIZE, mm.
DEPTH, M.
DEPTH, M.
0
1
2
3
4
5
6


RAM HARDNESS
1000
800
600
400
200
TEMPERATURE, °C
-40
-30
-20
0 STRATIGRAPHIC
0 PROFILE .2
DENSITY
0.4
0.6
0.8
STATION
DATE
TIME
LOCATION
OBSERVERS
STRATIGRAPHIC SYMBOLS
New snow, recognizable crystals.
Old snow, finegrained.
Old snow, angular grains coarse.
Old snow, rounded grains coarse.
Sublimation crystals.
Ice layer.
Ice lens.
Ice gland.
Crust.
HARDNESS
Soft (4 fingers)
Medium (1 finger)
Hard (pencil)
Very hard (knife)
DEPTH, M.
GRAIN SIZE, mm.
1958-59
1957-58
1956-57
1955-56
1954-55
1953-54
1952-53
1
2
3
4
5
6


RAM HARDNESS
1000 800 600 400 200
TEMPERATURE, °C -40 -30 -20
0 STRATIGRAPHIC
0 PROFILE, 2
DENSITY
0.4 0.6 0.8
STATION 550
DATE 23 Jan. 60 TIME Z
LOCATION 72°14'S.,
OBSERVERS Stuart, Maine
STRATIGRAPHIC SYMBOLS
New snow, recognizable crystals.
Old snow, finegrained.
Old snow, angular grains coarse.
Old snow, rounded grains coarse.
Sublimation crystals.
Ice layer.
Ice lens.
Ice gland.
Crust.
HARDNESS
Soft (4 fingers)
Medium (1 finger)
Hard (pencil)
Very hard (knife)
958-59
957-58
956-57
955-56
954-55
953-54
DEPTH, M.
GRAIN SIZE, mm.


RAM HARDNESS
1000 800 600 400 200 0
TEMPERATURE, °C -40 -30 -20
STRATIGRAPHIC PROFILE, 2
DENSITY 0.4 0.6 0.8
STATION 553
DATE 27 Feb. 60 TIME Z
LOCATION 78°17'S.
136°22'E.
OBSERVERS Stuart, Heine
STRATIGRAPHIC SYMBOLS
New snow, recognisable crystals.
Old snow, finegrained.
Old snow, angular grains coarse.
Old snow, rounded grains coarse.
Sublimation crystals.
Ice layer.
Ice lens.
Ice gland.
Crust.
HARDNESS
Soft (4 fingers)
Medium (1 finger)
Hard (pencil)
Very hard (knife)
1958-59
1957-58
1956-57
1955-56
1954-55
1953-54
1952-53
GRAIN SIZE, mm.
DEPTH, M.
DEPTH, M.
0
1
2
3
4
5
6


RAM HARDNESS
1000 800 600 400 200
TEMPERATURE, °C -30 -20 -10
0 STRATIGRAPHIC
0 PROFILE, 2
DENSITY
0.4 0.6 0.8
STATION 556
DATE 30 Jan. 60 TIME Z
LOCATION 72°23'S.,
OBSERVERS Stuart, Kaine
STRATIGRAPHIC SYMBOLS
New snow, recognizable crystals.
Old snow, finegrained.
Old snow, angular grains coarse.
Old snow, rounded grains coarse.
Sublimation crystals.
Ice layer.
Ice lens.
Ice gland.
Crust.
HARDNESS
Soft (4 fingers)
Medium (1 finger)
Hard (pencil)
Very hard (knife)
1958-59
1957-58
1956-57
1955-56
1954-55
1953-54
1952-53
1951-52
DEPTH, M.
GRAIN SIZE, mm.
DEPTH, M.


RAM HARDNESS
1000 800 600 400 200
TEMPERATURE, °C -30 -20 -10
0 STRATIGRAPHIC
0 PROFILE, 2
DENSITY
0.4 0.6 0.8
STATION 539
DATE 6 Feb. 60 TIME Z
LOCATION 72°38'S.,
OBSERVERS Stuart Helme
STRATIGRAPHIC SYMBOLS
New snow, recognizable crystals.
Old snow, finegrained.
Old snow, angular grains coarse.
Old snow, rounded grains coarse.
Sublimation crystals.
Ice layer.
Ice lens.
Ice gland.
Crust.
HARDNESS
Soft (4 fingers)
Medium (1 finger)
Hard (pencil)
Very hard (knife)
1958-59
1957-58
1956-57
1955-56
1954-55
DEPTH, M.
GRAIN SIZE, mm.
DEPTH, M.
0
1
2
3
4
5
6

APPENDIX II

CORE DENSITY TABULATION

NORTH VICTORIA LAND TRAVERSE
STATION: 512
OBSERVERS: STUART, HEINE

Depth cm.	Density gm/cm^3	Depth cm.	Density gm/cm^3	Depth cm.	Density gm/cm^3
77.0- 90.5	.42	753.0- 766.5	.48	1251.0-1270.0	.50
137.0-159.0	.45	766.5- 779.0	.43	1273.5-1295.0	.51
196.0-212.5	.48	782.0- 794.5	.48	1299.0-1312.0	.51
222.0-231.5	.39	794.5- 807.0	.42	1313.0-1326.0	.53
244.0-253.5	.33	809.5- 826.0	.44	1330.0-1344.0	.56
267.0-278.0	.45	829.5- 850.5	.50	1345.0-1359.0	.53
280.0-302.0	.50	853.5- 867.5	.46	1362.5-1379.5	.51
304.0-314.0	.39	867.5- 882.5	.50	1379.5-1393.0	.51
316.0-329.5	.45	886.5- 895.0	.44	1396.0-1414.0	.58
331.5-349.5	.39	898.0- 913.5	.42	1417.0-1431.5	.53
351.5-360.0	.35	913.5- 928.0	.52	1413.5-1444.0	.61
360.0-372.0	.42	932.5- 948.0	.47	1447.0-1456.0	.49
372.0-384.5	.44	948.0- 962.5	.48	1459.0-1475.0	.52
386.5-397.0	.38	967.5- 980.5	.47	1475.0-1490.0	.52
400.0-415.5	.40	980.5- 992.5	.44	1494.0-1507.5	.55
417.5-432.0	.42	995.5-1010.0	.50	1507.5-1521.0	.53
438.0-456.0	.46	1010.0-1024.0	.47	1524.5-1529.5	.53
461.0-474.0	.45	1026.5-1033.5	.54	1532.5-1546.5	.52
476.0-495.0	.46	1037.0-1051.5	.47	1547.0-1561.0	.53
497.0-508.0	.35	1051.5-1066.5	.51	1565.0-1573.5	.52
510.0-529.0	.41	1069.5-1077.5	.46	1575.0-1584.0	.46
532.0-546.5	.42	1080.5-1100.5	.50		
546.5-560.5	.46	1104.5-1120.5	.51		
566.0-587.5	.46	1120.5-1134.5	.51		
591.0-606.0	.40	1136.5-1144.0	.51		
610.0-624.0	.42	1147.0-1162.0	.51		
625.5-642.5	.46	1162.0-1175.0	.46		
646.5-666.5	.44	1179.0-1195.0	.50		
669.5-684.0	.49	1195.0-1211.0	.49		
684.0-699.0	.44	1213.0-1218.0	.46		
703.0-720.5	.44	1220.0-1235.0	.48		
724.0-747.5	.45	1235.0-1249.0	.48		

Total length of untrimmed pieces - 1470 cm.
Number of untrimmed pieces - 63
Total length of trimmed pieces - 1209 cm.
Number of trimmed pieces - 85
Mean density 3-10 metres - .44 gm/cm^3.
10-15 metres - .51 gm/cm^3.

NORTH VICTORIA LAND TRAVERSE
STATION: 519
OBSERVERS: STUART, HEINE

Depth cm.	Density gm/cm^3	Depth cm.	Density gm/cm^3	Depth cm.	Density gm/cm^3
0 - 9.5	.39	536.0-546.0	.44	1074.0-1085.0	.49
10.5- 15.0	.36	546.0-556.5	.41	1094.5-1108.5	.49
16.0- 26.5	.41	557.5-567.5	.40	1108.5-1124.0	.54
42.5- 50.0	.38	569.5-587.0	.42	1128.5-1146.0	.48
51.0- 62.5	.38	587.0-605.0	.48	1146.0-1164.0	.52
66.0- 78.0	.44	607.0-612.0	.47	1167.5-1187.0	.49
83.0- 93.0	.39	613.0-622.0	.47	1187.0-1206.0	.50
93.0-105.5	.39	623.0-641.0	.47	1210.0-1226.0	.52
125.0-134.0	.39	641.0-659.5	.51	1226.0-1240.5	.52
134.0-146.5	.40	660.5-674.5	.48	1244.5-1264.5	.54
146.5-160.5	.41	674.5-689.5	.50	1264.5-1282.5	.55
163.0-180.5	.38	690.5-700.5	.45	1286.5-1305.5	.50
183.0-199.0	.31	701.5-713.5	.49	1305.5-1324.5	.54
204.5-220.0	.43	713.5-725.0	.49	1327.5-1346.0	.57
220.0-225.5	.35	727.0-744.5	.52	1346.0-1364.5	.55
229.5-247.0	.45	748.5-761.0	.51	1367.5-1382.0	.47
248.0-254.5	.42	761.0-776.5	.50	1382.0-1395.5	.56
255.5-267.0	.39	781.0-792.0	.50	1398.5-1413.5	.53
267.0-281.0	.45	792.0-805.0	.50	1413.5-1429.0	.53
283.5-293.5	.44	809.0-823.0	.51	1429.0-1444.5	.56
293.5-305.5	.44	823.0-836.0	.50	1447.5-1461.5	.52
308.0-313.0	.49	840.0-851.0	.50	1461.5-1473.5	.55
315.0-335.0	.46	851.0-864.5	.49	1477.0-1493.5	.56
340.0-358.0	.45	869.5-885.5	.54	1493.5-1511.5	.55
364.5-381.0	.44	885.5-899.5	.54	1515.0-1528.0	.55
381.0-396.0	.46	903.5-916.0	.49	1528.0-1541.0	.55
401.0-413.0	.47	920.0-937.5	.58	1545.5-1561.5	.56
413.0-425.0	.47	937.5-952.0	.52	1561.5-1577.0	.57
429.0-436.0	.47	955.5-959.5	.46	1581.0-1594.5	.56
438.0-451.5	.43	963.0-979.5	.53	1594.5-1607.5	.55
451.5-467.5	.48	982.5-999.5	.50		
470.5-488.0	.42	1002.5-1017.5	.50		
488.0-505.0	.46	1022.5-1039.5	.50		
509.5-521.0	.54	1049.5-1062.5	.46		
521.0-531.5	.45	1062.5-1074.0	.49		

Total length of untrimmed pieces - 1546 cm.
Number of untrimmed pieces - 62.
Total length of trimmed pieces - 1377 cm.
Number of trimmed pieces.- 100
Mean density 3-10 metres - .48 gm/cm^3.
10-15 metres - .52 gm/cm^3.

NORTH VICTORIA LAND TRAVERSE
STATION: 521
OBSERVERS: STUART, HEINE

Depth cm.	Density gm/cm^3	Depth cm.	Density gm/cm^3	Depth cm.	Density gm/cm^3
5.5- 18.5	.36	832.5- 845.0	.52		
27.0- 37.0	.38	846.5- 861.0	.49		
41.5- 53.5	.37	863.5- 904.5	.48		
68.0- 80.0	.40	908.0- 937.0	.49		
88.5-105.5	.42	940.5- 970.5	.52		
110.0-128.0	.38	973.0-1005.5	.53		
132.5-146.0	.32	1008.0-1030.0	.57		
152.5-179.0	.41	1034.5-1050.5	.53		
185.5-201.5	.46	1055.0-1077.0	.52		
207.0-220.5	.35	1077.0-1099.0	.51		
225.5-245.5	.44	1102.5-1130.5	.50		
250.0-274.0	.40	1134.0-1153.0	.53		
278.0-286.5	.43	1153.0-1175.0	.54		
289.5-315.5	.43	1176.5-1207.5	.55		
320.5-334.5	.46	1209.0-1242.0	.54		
339.0-356.0	.44	1243.5-1281.5	.52		
360.5-392.0	.47	1284.0-1311.0	.54		
398.0-416.5	.47	1313.5-1335.0	.54		
420.0-438.5	.44	1335.0-1354.5	.57		
442.5-484.5	.42	1358.0-1393.0	.55		
489.0-517.0	.47	1396.5-1415.5	.56		
522.0-544.0	.47	1415.5-1435.0	.52		
547.5-558.5	.46	1439.5-1461.5	.56		
563.0-598.0	.50	1461.5-1485.0	.55		
601.5-636.5	.45	1489.0-1509.5	.56		
641.0-658.0	.47	1514.0-1531.5	.55		
661.5-666.5	.53	1531.5-1548.5	.59		
670.0-695.5	.50	1553.0-1586.0	.55		
697.5-724.5	.50				
727.0-758.0	.49				
761.5-797.5	.47				
800.0-830.0	.49				

Total length of untrimmed pieces - 1508 cm.
Number of untrimmed pieces - 55
Total length of trimmed pieces - 1361 cm.
Number of trimmed pieces - 60
Mean density 3-10 metres - .48 gm/cm^3.
10-15 metres - .54 gm/cm^3.

NORTH VICTORIA LAND TRAVERSE
STATION: 524
OBSERVERS: STUART, HEINE

Depth cm.	Density gm/cm^3	Depth cm.	Density gm/cm^3	Depth cm.	Density gm/cm^3
1.0- 9.5	.36	686.5- 708.5	.52	1377.5-1397.5	.60
12.0- 20.5	.38	712.0- 732.0	.49	1401.5-1417.5	.55
21.5- 35.0	.42	735.0- 753.0	.53	1417.5-1436.5	.56
37.5- 47.5	.44	755.0- 788.0	.53	1440.0-1466.0	.55
53.0- 60.5	.38	790.0- 813.0	.51	1469.5-1490.5	.59
67.5- 73.5	.44	813.0- 835.0	.53	1490.5-1512.0	.56
78.0- 97.5	.42	838.0- 871.0	.48	1515.0-1532.5	.54
103.0-116.5	.36	874.0- 884.0	.53	1532.5-1548.5	.57
120.5-126.0	.45	887.5- 907.0	.49	1550.5-1571.5	.57
129.5-155.5	.43	907.0- 924.0	.54	1571.5-1594.0	.57
159.0-182.5	.42	928.0- 950.0	.54	1596.0-1601.0	.60
185.5-206.0	.45	950.0- 968.0	.59		
208.5-226.5	.41	972.0- 990.5	.53		
229.5-243.5	.43	994.5-1009.5	.52		
247.0-277.5	.43	1013.5-1037.5	.49		
281.0-313.0	.46	1037.5-1059.5	.54		
317.5-323.0	.47	1063.5-1083.5	.55		
327.0-347.0	.41	1083.5-1101.5	.56		
349.5-372.5	.45	1105.5-1126.0	.50		
372.5-392.5	.47	1126.0-1145.0	.49		
394.5-417.5	.44	1148.0-1164.0	.52		
420.0-426.0	.51	1164.0-1179.5	.54		
429.5-452.0	.48	1183.0-1195.5	.56		
452.0-472.0	.51	1195.5-1215.0	.55		
476.5-498.0	.47	1217.0-1232.5	.53		
500.5-520.5	.46	1232.5-1251.5	.56		
523.0-551.5	.46	1255.5-1272.5	.53		
555.5-578.0	.46	1272.5-1294.0	.56		
578.0-599.5	.49	1297.5-1313.5	.57		
602.0-638.0	.51	1313.5-1331.0	.55		
639.0-660.5	.53	1333.0-1351.0	.57		
664.5-686.5	.54	1354.5-1377.5	.56		

Total length of untrimmed pieces - 1549 cm.
Number of untrimmed pieces - 55
Total length of trimmed pieces - 1422 cm.
Number of trimmed pieces - 75
Mean density 3-10 metres - .50 gm/cm^3.
10-15 metres - .55 gm/cm^3.

NORTH VICTORIA LAND TRAVERSE
STATION: 527
OBSERVERS: LORIUS

Depth cm.	Density gm/cm^3	Depth cm.	Density gm/cm^3	Depth cm.	Density gm/cm^3
46.0- 54.5	.37	748.0- 759.3	.55	1336.7-1349.5	.55
59.0- 68.0	.35	762.5- 779.5	.52	1353.7-1370.8	.54
72.0- 84.7	.39	779.5- 794.2	.50	1370.8-1387.8	.55
110.0-131.8	.45	798.0- 813.8	.50	1391.7-1407.7	.53
136.0-148.0	.47	813.8- 830.8	.46	1407.7-1424.0	.54
163.0-182.6	.40	830.8- 847.4	.49	1434.2-1456.2	.54
186.9-206.7	.45	852.0- 865.3	.42	1461.0-1476.0	.57
206.7-227.0	.36	865.3- 876.8	.50	1476.0-1488.7	.52
233.4-251.4	.38	881.0- 894.3	.49	1493.7-1510.7	.54
251.4-269.0	.44	894.3- 905.3	.48	1510.7-1527.2	.56
274.5-297.0	.45	907.8- 918.0	.52	1530.4-1549.0	.54
301.7-319.0	.39	923.0- 944.7	.51	1549.0-1567.7	.54
324.3-344.0	.45	944.7- 963.5	.47	1571.7-1585.0	.55
344.0-359.4	.41	969.0- 982.1	.52	1585.0-1596.4	.56
359.4-372.0	.43	982.1- 995.5	.53	1601.8-1621.2	.54
376.9-398.5	.46	998.3-1013.3	.53	1626.9-1642.4	.57
398.5-418.0	.40	1013.3-1028.0	.52	1642.4-1657.7	.54
421.0-442.0	.44	1031.3-1045.9	.50	1657.7-1670.2	.55
442.0-466.5	.42	1045.9-1059.7	.53	1675.2-1698.0	.55
470.9-484.9	.46	1086.4-1099.2	.53		
484.9-500.0	.46	1102.1-1124.2	.53		
505.1-523.2	.46	1127.2-1146.2	.55		
523.2-541.0	.43	1146.2-1165.3	.53		
546.0-562.0	.45	1169.2-1186.0	.52		
562.0-581.0	.46	1186.0-1201.0	.52		
587.0-606.9	.44	1205.0-1221.7	.52		
606.9-626.0	.49	1221.7-1239.8	.53		
631.5-648.7	.53	1243.2-1256.8	.53		
648.7-665.5	.46	1256.8-1270.3	.52		
670.0-689.8	.47	1273.7-1293.7	.53		
689.8-710.1	.51	1296.7-1310.2	.54		
714.0-731.0	.49	1313.7-1333.3	.51		

Total length of untrimmed pieces - 1697 cm.
Number of untrimmed pieces - 53
Total length of trimmed pieces - 1370 cm.
Number of trimmed pieces - 83
Mean density 3-10 metres - .47 gm/cm^3.
10-15 metres - .53 gm/cm^3.

NORTH VICTORIA LAND TRAVERSE
STATION: 531 (B.61)
OBSERVERS: STUART, HEINE

Depth cm.	Density gm/cm^3	Depth cm.	Density gm/cm^3	Depth cm.	Density gm/cm^3
28.0- 35.0	.39	637.0- 653.0	.50	1186.0-1202.0	.53
42.0- 46.5	.37	658.0- 676.0	.48	1202.0-1217.0	.56
62.0- 70.0	.41	676.0- 696.0	.47	1217.0-1231.5	.56
77.0- 89.0	.42	699.0- 722.0	.49	1236.0-1251.5	.57
95.0-115.0	.40	725.0- 741.0	.54	1251.5-1266.5	.55
138.0-150.0	.42	741.0- 753.5	.49	1266.5-1286.0	.56
155.0-168.0	.39	753.5- 766.0	.52	1286.0-1300.5	.57
173.0-177.0	.44	769.0- 783.0	.50	1305.0-1319.0	.56
181.0-204.0	.43	783.0- 798.0	.47	1319.0-1333.5	.57
210.0-221.5	.41	798.0- 811.0	.54	1333.5-1352.0	.55
227.0-237.0	.44	814.0- 824.0	.49	1354.0-1368.5	.56
243.0-267.0	.47	828.0- 854.0	.50	1368.5-1383.0	.53
272.0-283.0	.40	857.0- 873.0	.48	1387.0-1403.0	.54
288.0-303.5	.43	873.0- 887.5	.52	1403.0-1419.5	.55
303.5-320.5	.39	887.5- 902.0	.50	1424.0-1444.5	.55
320.5-338.0	.43	905.5- 923.0	.51	1444.5-1464.0	.58
344.0-371.0	.46	923.0- 941.0	.52	1467.0-1482.0	.58
377.0-394.0	.46	944.0- 959.0	.53	1482.0-1497.5	.56
394.0-409.0	.42	959.0- 974.0	.53	1501.0-1515.5	.54
409.0-427.0	.44	974.0- 989.0	.52	1515.5-1529.5	.56
435.0-449.5	.46	992.5-1008.0	.54	1529.5-1542.0	.54
449.5-462.0	.46	1008.0-1023.5	.53	1545.0-1571.5	.55
462.0-470.0	.48	1026.5-1039.5	.54		
477.0-492.5	.49	1039.5-1051.0	.54		
492.5-509.5	.47	1055.5-1068.0	.52		
531.5-537.0	.50	1077.0-1090.5	.51		
540.0-554.0	.44	1098.5-1110.0	.55		
556.0-570.5	.48	1112.0-1121.0	.51		
574.0-589.0	.49	1124.0-1138.5	.55		
589.0-604.0	.51	1138.5-1152.5	.54		
604.0-617.0	.51	1156.0-1170.0	.54		
622.0-637.0	.49	1170.0-1182.0	.55		

Total length of untrimmed pieces - 1573 cm.
Number of untrimmed pieces - 54
Total length of trimmed pieces - 1276 cm.
Number of trimmed pieces - 86
Mean density 3-10 metres - .49 gm/cm^3.
10-15 metres - .55 gm/cm^3.

NORTH VICTORIA LAND TRAVERSE
STATION: 536
OBSERVERS: STUART, HEINE

Depth cm.	Density gm/cm^3	Depth cm.	Density gm/cm^3	Depth cm.	Density gm/cm^3
10.0- 18.0	.42	534.5- 552.0	.50	1127.0-1137.5	.56
20.0- 29.5	.45	557.0- 575.0	.50	1141.0-1160.0	.52
32.5- 42.0	.40	575.0- 592.5	.52	1160.0-1177.5	.55
46.0- 55.0	.42	592.5- 607.5	.52	1181.0-1198.0	.55
57.5- 67.0	.41	612.0- 628.0	.42	1198.0-1215.5	.56
71.0- 86.5	.41	628.0- 643.0	.47	1218.5-1237.0	.53
89.0-103.5	.43	647.0- 669.0	.48	1237.0-1255.5	.54
104.0-118.5	.39	672.0- 690.5	.50	1255.5-1275.0	.53
120.5-133.0	.47	690.5- 707.5	.48	1278.0-1292.5	.57
146.5-165.0	.36	711.0- 726.0	.50	1292.5-1305.0	.57
165.0-183.5	.42	729.0- 749.0	.50	1307.0-1323.0	.54
186.5-208.5	.43	749.0- 769.0	.49	1323.0-1338.5	.57
208.5-229.0	.46	772.0- 775.5	.48	1341.5-1361.5	.58
232.5-247.5	.38	779.0- 791.5	.49	1361.5-1381.0	.57
247.5-259.5	.42	791.5- 812.5	.46	1384.0-1403.0	.57
263.5-273.0	.50	815.0- 836.0	.53	1403.0-1422.0	.57
277.0-293.0	.46	838.5- 848.0	.39	1425.0-1445.0	.56
293.0-308.0	.47	850.0- 869.5	.54	1445.0-1467.5	.56
308.0-323.0	.50	869.5- 890.0	.55	1471.0-1484.0	.58
327.0-341.0	.46	893.0- 910.5	.53	1487.0-1503.5	.55
341.0-354.0	.41	910.5- 925.0	.52	1506.5-1525.5	.58
359.0-374.0	.46	925.0- 938.0	.53	1525.5-1543.0	.54
377.0-391.5	.43	942.0- 960.0	.55	1545.5-1562.0	.53
391.5-405.5	.49	960.0- 979.0	.56	1562.0-1577.5	.55
410.0-420.5	.47	983.0-1002.0	.55		
424.0-434.0	.44	1002.0-1020.5	.54		
434.0-448.0	.49	1025.5-1042.5	.57		
448.0-463.0	.46	1042.5-1058.0	.54		
466.0-476.0	.43	1062.0-1078.5	.55		
479.5-495.5	.47	1078.5-1094.5	.53		
495.5-513.0	.50	1094.5-1110.0	.52		
517.5-534.5	.51	1114.0-1127.0	.55		

Total length of untrimmed pieces - 1578 cm.
Number of untrimmed pieces - 53
Total length of trimmed pieces - 1395 cm.
Number of trimmed pieces - 88
Mean density 3-10 metres - .49 gm/cm^3.
10-15 metres - .55 gm/cm^3.

NORTH VICTORIA LAND TRAVERSE
STATION: 540
OBSERVERS: VAN DER HOEVEN, WEIHAUPT

Depth cm.	Density gm/cm^3	Depth cm.	Density gm/cm^3	Depth cm.	Density gm/cm^3
0.0- 7.0	.40	591.0- 607.0	.50	1105.0-1120.0	.56
7.0- 19.0	.48	607.0- 621.0	.47	1124.0-1137.0	.56
19.0- 38.0	.41	627.0- 644.0	.50	1137.0-1150.0	.56
38.0- 53.0	.44	644.0- 662.0	.52	1155.0-1174.0	.52
55.0- 73.0	.43	666.0- 680.0	.51	1174.0-1192.0	.55
75.0- 78.0	.46	680.0- 692.0	.50	1192.0-1211.0	.57
80.0-100.0	.45	697.0- 712.0	.52	1215.0-1222.0	.63
103.0-125.0	.38	712.0- 725.0	.51	1227.0-1245.0	.55
125.0-147.0	.42	725.0- 742.0	.49	1245.0-1263.0	.55
150.0-172.0	.42	745.0- 758.0	.53	1263.0-1282.0	.57
172.0-193.0	.41	758.0- 770.0	.55	1286.0-1300.0	.58
193.0-214.0	.41	774.0- 791.0	.53	1300.0-1317.0	.57
218.0-235.0	.46	791.0- 808.0	.49	1321.0-1339.0	.55
235.0-255.0	.39	808.0- 823.0	.46	1339.0-1358.0	.54
259.0-274.0	.40	827.0- 846.0	.48	1363.0-1378.0	.53
279.0-294.0	.41	846.0- 860.0	.49	1378.0-1396.0	.55
294.0-312.0	.45	864.0- 878.0	.56	1396.0-1413.0	.57
315.0-339.0	.41	878.0- 891.0	.53	1418.0-1424.0	.53
343.0-353.0	.38	891.0- 904.0	.53	1424.0-1438.0	.56
353.0-370.0	.36	908.0- 922.0	.54	1438.0-1450.0	.57
375.0-390.0	.41	922.0- 938.0	.56	1454.0-1466.0	.57
396.0-410.0	.43	940.0- 952.0	.53	1466.0-1480.0	.53
410.0-428.0	.45	952.0- 971.0	.57	1484.0-1495.0	.58
428.0-448.0	.46	971.0- 988.0	.55	1495.0-1509.0	.57
454.0-471.0	.49	992.0-1004.0	.56	1509.0-1524.0	.54
471.0-484.0	.53	1004.0-1017.0	.56	1529.0-1546.0	.56
492.0-501.0	.43	1017.0-1033.0	.52	1546.0-1565.0	.55
501.0-516.0	.47	1037.0-1045.0	.50	1571.0-1590.0	.56
516.0-533.0	.52	1048.0-1055.0	.63	1590.0-1608.0	.55
538.0-554.0	.46	1055.0-1072.0	.55	1613.0-1632.0	.55
554.0-568.0	.49	1076.0-1090.0	.54		
574.0-591.0	.50	1090.0-1105.0	.55		

Total length of untrimmed pieces - 1634 cm.
Number of untrimmed pieces - 46
Total length of trimmed pieces - 1453 cm.
Number of trimmed pieces - 94
Mean density 3-10 metres - .49 gm/cm^3.
10-15 metres - .56 gm/cm^3.

NORTH VICTORIA LAND TRAVERSE
STATION: 544
OBSERVERS: STUART, HEINE

Depth cm.	Density gm/cm^3	Depth cm.	Density gm/cm^3	Depth cm.	Density gm/cm^3
42.0- 52.5	.40	672.0- 689.0	.51	1289.0-1307.0	.58
55.5- 73.0	.39	692.5- 709.5	.53	1307.0-1323.5	.53
79.5- 84.5	.36	709.5- 725.5	.49	1327.5-1347.5	.53
89.5-109.5	.37	729.5- 745.5	.52	1347.5-1368.0	.55
113.5-127.0	.37	748.5- 771.5	.51	1372.0-1387.0	.56
132.5-150.5	.38	774.5- 795.5	.52	1387.0-1403.0	.53
156.5-171.5	.41	799.0- 812.0	.50	1406.5-1423.5	.55
176.5-194.0	.45	815.0- 832.0	.51	1423.5-1440.0	.57
194.0-211.0	.49	836.0- 853.0	.55	1443.5-1462.0	.60
215.0-233.5	.48	853.0- 862.0	.48	1462.0-1480.0	.56
233.5-240.0	.37	866.0- 885.0	.53	1484.0-1500.0	.58
240.0-253.0	.46	885.0- 903.5	.54	1500.0-1516.5	.57
256.0-274.0	.43	907.5- 920.5	.52	1520.5-1539.5	.53
274.0-296.5	.46	920.5- 932.0	.49	1539.5-1557.5	.56
301.0-308.0	.46	936.0- 957.5	.58	1557.5-1574.0	.56
312.5-332.5	.45	961.0- 982.5	.57	1576.0-1596.0	.55
332.5-350.0	.42	985.0-1000.0	.55		
354.5-372.5	.46	1000.0-1015.0	.50		
372.5-392.0	.40	1018.0-1023.0	.43		
392.0-412.0	.45	1026.0-1044.0	.51		
417.5-441.5	.41	1044.0-1060.5	.46		
447.5-468.0	.41	1060.5-1073.0	.54		
468.0-490.0	.47	1078.0-1097.0	.57		
494.5-513.5	.47	1097.0-1115.5	.52		
513.5-530.0	.49	1115.5-1134.0	.48		
534.5-552.5	.47	1138.0-1161.0	.52		
552.5-568.0	.41	1163.0-1181.0	.54		
572.5-591.5	.45	1181.0-1202.0	.54		
591.5-610.5	.41	1205.5-1225.0	.51		
614.5-633.0	.49	1225.0-1247.0	.51		
633.0-648.5	.44	1251.0-1268.0	.50		
653.5-672.0	.49	1268.0-1284.0	.55		

Total length of untrimmed pieces - 1553 cm.
Number of untrimmed pieces - 48
Total length of trimmed pieces - 1368 cm.
Number of trimmed pieces - 80
Mean density 3-10 metres - .48 gm/cm^3.
10-15 metres - .53 gm/cm^3.

NORTH VICTORIA LAND TRAVERSE
STATION: 548
OBSERVERS: VAN DER HOEVEN, WEIHAUPT

Depth cm.	Density gm/cm^3	Depth cm.	Density gm/cm^3	Depth cm.	Density gm/cm^3
28.0- 35.0	.43	652.0- 670.5	.47	1342.5-1362.0	.55
36.0- 43.5	.40	673.5- 695.5	.45	1362.0-1381.0	.53
46.0- 54.0	.47	695.5- 718.5	.51	1384.0-1400.0	.56
57.0- 63.0	.38	721.5- 743.5	.50	1400.0-1420.5	.55
64.0- 85.5	.44	743.5- 763.5	.51	1422.5-1441.5	.54
88.0- 91.5	.49	766.0- 785.5	.51	1441.5-1459.0	.57
93.0-123.0	.38	785.5- 804.5	.52	1461.5-1486.5	.57
124.0-126.5	.37	806.5- 829.5	.49	1489.5-1512.0	.57
130.0-144.0	.38	829.5- 850.5	.51	1512.0-1530.0	.53
149.0-157.5	.33	853.5- 876.0	.51	1534.0-1553.5	.56
181.0-198.0	.49	876.0- 898.0	.50	1553.5-1574.5	.53
198.0-218.5	.46	898.0- 911.5	.51	1576.5-1587.5	.54
222.5-241.5	.41	915.5- 938.0	.51		
241.5-257.0	.32	941.5- 959.5	.54		
261.0-276.0	.42	959.5- 973.0	.50		
279.0-301.0	.44	976.5- 997.5	.52		
301.0-320.5	.43	997.5-1013.0	.52		
324.5-344.5	.41	1016.0-1033.5	.51		
347.5-364.5	.40	1033.5-1054.0	.52		
367.0-388.5	.47	1058.0-1084.5	.54		
388.5-413.5	.48	1084.5-1109.0	.52		
417.0-437.5	.40	1112.5-1129.0	.52		
437.5-454.5	.45	1129.0-1145.0	.52		
458.5-482.5	.45	1147.0-1165.0	.51		
482.5-501.5	.43	1165.0-1179.5	.53		
501.5-514.5	.47	1182.0-1201.0	.55		
517.5-532.5	.49	1201.0-1220.0	.55		
532.5-550.5	.52	1223.5-1248.5	.54		
553.5-576.5	.43	1248.5-1274.5	.54		
576.5-598.5	.46	1277.5-1302.5	.54		
601.5-628.5	.45	1305.0-1324.0	.55		
632.0-652.0	.46	1324.0-1339.5	.54		

Total length of untrimmed pieces - 1589 cm.
Number of untrimmed pieces - 48
Total length of trimmed pieces - 1427 cm.
Number of trimmed pieces - 76
Mean density 3-10 metres - .48 gm/cm^3.
10-15 metres - .54 gm/cm^3.

NORTH VICTORIA LAND TRAVERSE
STATION: 550
OBSERVERS: VAN DER HOEVEN, WEIHAUPT

Depth cm.	Density gm/cm^3	Depth cm.	Density gm/cm^3	Depth cm.	Density gm/cm^3
82.0-103.0	.39	784.5- 806.0	.51	1485.5-1503.0	.57
106.0-116.0	.36	812.5- 830.0	.50	1505.5-1523.5	.58
118.0-127.0	.46	830.0- 849.0	.52	1523.5-1538.5	.56
128.0-134.0	.45	852.5- 875.5	.52	1540.5-1561.5	.56
136.0-161.5	.36	875.5- 892.0	.50	1561.5-1577.0	.56
165.0-179.0	.37	896.0- 912.5	.54	1579.5-1598.0	.59
183.0-210.0	.40	912.5- 930.0	.56		
217.0-240.0	.41	933.5- 962.5	.52		
240.0-265.0	.43	962.5- 985.0	.53		
273.0-293.0	.45	988.5-1016.0	.52		
293.0-309.0	.46	1019.0-1045.0	.53		
312.0-332.0	.44	1045.0-1065.5	.52		
332.0-351.0	.44	1068.0-1083.5	.58		
353.5-381.5	.46	1083.5-1102.5	.57		
381.5-401.0	.50	1105.0-1123.0	.55		
405.5-433.0	.45	1123.0-1141.0	.56		
433.0-460.0	.46	1145.0-1165.0	.56		
464.0-485.0	.47	1165.0-1183.0	.57		
485.0-506.5	.46	1186.5-1205.0	.55		
509.0-535.0	.46	1205.0-1223.0	.56		
540.5-561.0	.48	1227.0-1256.0	.55		
561.0-579.0	.53	1260.5-1280.0	.54		
588.0-607.0	.47	1280.0-1300.0	.57		
607.0-634.5	.47	1304.5-1324.5	.58		
634.5-648.5	.46	1324.5-1345.0	.57		
655.0-670.5	.51	1349.0-1371.5	.59		
670.5-687.0	.53	1371.5-1387.0	.55		
691.0-705.0	.53	1390.0-1412.0	.57		
705.0-722.0	.51	1412.0-1430.5	.47		
727.0-746.5	.50	1431.5-1449.0	.56		
746.5-762.0	.48	1449.0-1463.5	.57		
770.0-784.5	.50	1466.5-1485.5	.57		

Total length of untrimmed pieces - 1598 cm.
Number of untrimmed pieces - 48
Total length of trimmed pieces - 1364 cm.
Number of trimmed pieces - 70
Mean density 3-10 metres - .49 gm/cm^3.
10-15 metres - .56 gm/cm^3.

NORTH VICTORIA LAND TRAVERSE
STATION: 553
OBSERVERS: LORIUS

Depth cm.	Density gm/cm^3	Depth cm.	Density gm/cm^3	Depth cm.	Density gm/cm^3
1.0- 11.5	.43	710.5- 724.5	.53	1408.0-1427.0	.55
15.5- 23.5	.38	728.0- 746.0	.51	1432.5-1448.0	.57
67.5- 87.5	.42	746.0- 760.5	.51	1448.0-1466.0	.57
93.5-103.8	.38	765.0- 784.0	.48	1471.0-1487.0	.59
111.0-114.5	.47	784.0- 798.5	.53	1487.0-1502.0	.51
128.2-138.5	.40	803.0- 824.0	.49	1506.0-1523.5	.57
143.5-163.0	.41	824.0- 847.0	.48	1523.5-1540.0	.52
163.0-181.5	.43	852.0- 872.0	.49	1545.5-1564.0	.56
187.5-206.5	.40	872.0- 887.0	.50	1564.0-1579.0	.57
213.8-230.5	.44	892.0- 912.5	.53		
238.2-256.4	.43	912.5- 930.5	.53		
256.4-273.9	.45	937.0- 961.0	.45		
278.9-287.3	.43	961.0- 974.0	.54		
294.9-316.6	.44	979.0- 997.0	.52		
324.9-343.4	.41	997.0-1015.0	.52		
343.4-361.9	.39	1018.0-1040.5	.53		
385.9-402.9	.46	1045.0-1064.5	.52		
402.9-420.4	.45	1064.5-1083.0	.52		
426.9-448.9	.45	1088.0-1100.0	.54		
448.9-468.4	.44	1104.0-1132.0	.56		
472.9-492.4	.49	1137.0-1156.0	.53		
492.4-512.9	.43	1156.0-1175.0	.57		
514.9-534.9	.50	1180.0-1207.5	.54		
534.9-553.9	.47	1213.0-1237.5	.50		
557.9-577.4	.49	1237.5-1258.5	.53		
577.4-593.9	.48	1263.0-1279.0	.54		
596.9-613.9	.44	1279.0-1292.5	.53		
616.9-632.9	.49	1298.0-1319.0	.54		
632.9-651.9	.46	1319.0-1338.0	.54		
655.0-672.0	.49	1341.0-1363.5	.54		
672.0-688.5	.49	1365.0-1383.0	.56		
691.0-709.5	.53	1388.5-1408.0	.55		

Total length of untrimmed pieces - 1535 cm.
Number of untrimmed pieces - 49
Total length of trimmed pieces - 1291 cm.
Number of trimmed pieces - 73
Mean density 3-10 metres - .48 gm/cm^3.
10-15 metres - .54 gm/cm^3.

NORTH VICTORIA LAND TRAVERSE
STATION: 556
OBSERVERS: LORIUS, STUART

Depth cm.	Density gm/cm^3	Depth cm.	Density gm/cm^3	Depth cm.	Density gm/cm^3
3.0- 13.0	.49	731.0- 748.0	.51	1387.0-1403.5	.58
64.0- 79.0	.37	748.0- 766.0	.50	1409.5-1427.5	.60
83.0- 90.5	.46	769.0- 781.5	.56	1427.5-1443.5	.61
95.5-118.0	.41	786.0- 798.0	.50	1449.5-1467.5	.61
124.0-129.0	.32	802.0- 811.0	.52	1467.5-1483.5	.60
136.0-160.5	.38	813.5- 836.5	.54	1488.5-1507.0	.61
166.0-171.5	.40	841.0- 861.5	.54	1507.0-1523.0	.59
178.5-197.0	.38	861.5- 881.5	.50	1523.0-1538.0	.60
204.0-223.0	.49	887.5- 897.5	.55	1542.5-1563.5	.57
226.5-246.5	.47	900.5- 916.0	.55	1568.5-1580.5	.60
246.5-268.0	.47	916.0- 928.5	.55		
272.0-289.0	.44	932.5- 940.5	.58		
289.0-307.5	.47	944.5- 960.5	.54		
312.0-333.0	.43	960.5- 975.5	.54		
333.0-352.5	.44	980.0- 993.5	.53		
358.0-372.0	.48	998.5-1018.5	.55		
376.0-382.5	.39	1023.5-1047.0	.54		
387.0-410.5	.47	1047.0-1063.5	.54		
415.0-429.5	.46	1069.0-1091.5	.53		
429.5-444.0	.45	1097.5-1121.0	.54		
450.0-474.5	.49	1128.5-1147.5	.58		
474.5-495.5	.48	1154.5-1170.5	.55		
502.0-519.0	.50	1170.5-1185.5	.57		
525.0-542.0	.47	1192.5-1216.0	.59		
549.0-569.0	.50	1216.0-1238.0	.57		
569.0-590.0	.50	1244.5-1252.5	.58		
596.5-613.0	.55	1257.5-1273.5	.58		
613.0-627.0	.47	1280.0-1300.5	.59		
634.0-654.0	.50	1300.5-1320.5	.57		
662.0-678.0	.52	1328.0-1346.0	.60		
686.0-704.5	.54	1346.0-1362.5	.58		
704.5-725.0	.49	1370.0-1387.0	.58		

Total length of untrimmed pieces - 1534 cm.
Number of untrimmed pieces - 55
Total length of trimmed pieces - 1259 cm.
Number of trimmed pieces - 74
Mean density 3-10 metres - .50 gm/cm^3.
10-15 metres - .58 gm/cm^3.