I. Introduction

Oversnow traverses were conducted by the 29th Japanese Antarctic Research Expedition 1987-1989 (JARE-29), Syowa Party and Asuka Party.

The major activities of JARE-29 Syowa Party involved oversnow traverses along Route IM, from Mizuho Station to Advance Camp (74°12'S, 34°59'E, 3200 m a.s.l.), and the upstream area of Mizuho Station during the period from October 1988 to January 1989. And search for Antarctic meteorites was conducted by JARE-29 Asuka Party led by Dr. Keizo Yanai. Asuka Party made five inland oversnow traverses from a bare ice area to another around the Sør Rondane Mountains. During oversnow traverses, the following glaciological surveys and observations were carried out, a measurement of snow accumulation by the stake method, a positioning with JMR, a snow stratigraphic observation and snow sampling and a survey for flow velocity and strain rates of the ice sheet surface.

Oversnow traverse routes by JARE-29 are shown in Fig. A (see the end of this volume), and the terms are listed in Tables I-1 and I-2. Among the data obtained during these traverses, the following data are compiled in this report: position and elevation of stations; net accumulation of snow by the stake method; surface meteorological data during the oversnow traverses; the distribution pattern of the surface slope; Ram hardness profile. The other data will be presented elsewhere.

The authors would like to thank all members of the wintering party of JARE-29 led by Dr. Okitsugu Watanabe and Dr. Keizo Yanai, who extended generous supports in the field work.

Table I-1. Oversnow traverses carried out by JARE-29 Syowa Party.

Period	Traverse route	Distance (km)	Position and elevation	Surface meteorological data	Net accumulation	Surface slope	Rammzonde hardness
23 Aug. '88 - 4 Sep.	S16-Mizuho -S16	580		Table III-1	Table IV-1, 4-9		
3 Oct. - 6 Oct.	S16-Mizuho	290		Table III-2			
7 Oct. - 4 Nov.	Mizuho-G6 -A.C.-G6	690		Table III-2	Table IV-2, 10-12		
8 Nov.	G6-A-B-C -Mizuho	430	Table II-1, 2,3	Table III-2		Fig. 1	Fig. 2
30 Nov. - 4 Dec.	Mizuho-S16	260		Table III-2			
30 Nov. - 3 Dec.	Mizuho-G15	80		Table III-3	Table IV-3		
8 Dec. -22 Dec.	G15-G17 -Mizuho	220	Table II-4	Table III-3		Fig. 1	Fig. 2
25 Dec. - 1 Jan. '89	Mizuho-S16	260		Table III-3	Table IV-1, 4-9		

Table I-2. Oversnow traverses carried out by JARE-29 Asuka Party.

Period	Traverse route	Distance (km)	Position and elevation	Surface meteorological data	Net accumulation
6 Jan. '88 -3 Feb.	Asuka-Balchenfjella -Asuka	324			Table V-1
6 Feb. -8 Feb.	Asuka-L47.5 -Asuka	147			
10 Feb. -5 Mar.	Asuka-Nansenisen (A246)-Asuka	492	Table II-5	Table III-4	
24 Mar. -4 Apr.	Asuka-RY175 -Asuka	324			Table V-1
13 Apr. -15 Apr.	Asuka-Brattnipane -Asuka	73			
22 Sep. -27 Sep.	Asuka-L47.5 -Asuka	147			Table V-2
15 Oct. -29 Oct.	Asuka-A40(B0)-B113 -A130-Asuka	329	Table II-5	Table III-5	
13 Nov. -21 Jan. '89	Asuka-Nansenisen (A233)-A506	540	Table II-5		

II. Position and Elevation of Stations

1-1. Position along new routes by Syowa Party

Observers: Teruo FURUKAWA, Katsumoto SEKO,
Okitsugu WATANABE, Tatsunori INOUE,
Shuji AOKI and Haruo MIKAMI

Three routes were newly established in 1988 by JARE-29 (see Fig. A). Route from G6 to A-point and route from A-point to IM 3 (Route IM) were established, and Route NY was extended from G15 grid station to 71°32'S and 47°08'E, where G17 grid station (NY135) was established in December 1988. We named Route E for the route from B-point to IM 3. On Route E, the marker stakes were installed every 2 km, and were numbered from the beginning to the end of the route. These numbered stakes were to be used for snow accumulation measurement. On all the new routes, glaciological observations were made every about 5 km or 10 km. The place of an individual stake and observational point are to be called station.

1-2. Position along the new routes by Asuka Party

Observers: Shuji FUJITA, Hiroshi NARAOKA and
Keizo YANAI

Two routes were newly established in 1988 by JARE-29 Asuka Party (See Fig. A). New Routes A and B run from Asuka Station to A246' (72°50'S, 24°15'E). They were established for meteorite search in Nansenisen. In order to reach there, Route A was initially established. But since there were many crevasses between A90 and A100, a bypass was established later partly for safety and partly for short cut from A40 to A118. We named this bypass "Route B". Route B starts from A40 (B0) to A118 (B113). Therefore we record in this report the following routes, Asuka (A0)-A40 (B0)-B113 (A118)-A246 (Nansenisen).

On the new route, the marker stakes were installed every 1 km, and every stake was numbered from the beginning to the end of the route. Thus every number denotes the distance along the route from the stake to Asuka Station. The stakes which have even numbers were to be used for snow accumulation measurements. The place of individual station is to be called station.

1-3. Calculation of positions along routes

Navigational data, the azimuth and the distance between neighboring stations, were obtained with a magnetic hand compass and an odometer of a vehicle, respectively. By operating a doppler satellite positioning system (JMR 4A), the positions of stations were determined from place to place along the routes. The JMR data, which were calculated on the WGS-72 earth ellipsoid with broadcasted ephemerides, were interpolated by the help of the navigational data using a standard spherical trigonometry. The positions of stations were thus obtained on the new routes as shown in Tables II-1~II-5. For positioning with JMR, the number of pass was 10 to 50 at most stations, and the error would be ±10 to ±30m (Shibuya et al., 1982), which approximately corresponds to ±1" in latitude and ±3" in longitude. The overall error for the position of a station is considered to be at most ±10" (±30") in latitude (longitude) for the new routes when the errors in the navigational data were taken into account.

2. Elevation along new routes

Syowa Party observers: Teruo FURUKAWA, Tatsunori INOUE, Tetsuro UEKUBO and Haruo MIKAMI

Asuka Party observers: Shuji FUJITA and Nobuhiko AZUMA

The measurements with barometric altimeters (American Paulin Altimeter MM1) were made with one or four altimeters. The observations with JMR also gave the data on elevation. These data are much more precise than those by barometric altimeter, thus are considered as basic data for elevation. They were obtained, however, only sporadically along the routes, and hence the JMR data were interpolated by the use of barometric data for stations between the JMR stations. The final results on elevation are tabulated in Tables II-1~II-5. The errors in determining elevations by JMR would be about ±10m for the pass number of 10 to 50 (Shibuya et al., 1982).

Reference

Shibuya, K., Ito, K. and Kaminuma K. (1982) : Utilization of an NNSS receiver in the explosion seismic experiments on the Prince Orav Coast, East Antarctica 2. Positioning. Nankyoku Shiryô (Antarct. Rec.), 76, 73-88.

Table II-1. Position and elevation of stations of route from G6 to A-point.

*JMR station

Station	Latitude (S)			Longitude (E)			Elevation (m)
G6	* 73°	06'	40"	39°	45'	31"	3006
G- 5	73	06	29	39	54	47	3001
G- 10	73	06	17	40	04	02	3001
G- 15	73	06	06	40	13	18	3018
G- 20	73	05	54	40	23	33	3025
G- 25	73	05	43	40	32	49	3020
G- 30	73	05	31	40	41	04	3020
G- 35	73	05	20	40	50	20	3026
G- 40	73	05	08	41	59	35	3032
G- 45	73	04	57	41	08	51	3046
G- 50	73	04	46	41	18	06	3043
G- 55	73	04	34	41	27	22	3043
G- 60	73	04	23	41	36	37	3038
G- 65	73	04	11	41	45	53	3044
G- 70	73	04	00	41	55	09	3046
G- 75	73	03	48	42	04	24	3051
G- 80	73	03	37	42	13	40	3056
G- 85	73	03	25	42	22	55	3056
G- 90	73	03	14	42	32	11	3051
G- 95	73	03	02	42	41	26	3050
G-100	73	02	51	42	50	42	3053
G-105	73	02	40	42	59	57	3053
G-110	73	02	28	43	09	13	3053
G-115	73	02	17	43	18	28	3069
G-120	73	01	05	43	27	44	3075
G-125	73	01	54	43	37	00	3063
G-130	73	01	42	43	46	15	3064
G-135	73	01	31	43	55	31	3066
G-140	73	01	19	44	04	46	3064
G-145	73	01	08	44	14	02	3073
G-150	73	00	57	44	23	17	3068
G-155	73	00	45	44	32	33	3067
G-160	73	00	34	44	41	48	3067
G-165	73	00	22	44	51	04	3066
A-point	* 71	00	13	47	58	28	3066

Table II-2. Position and elevation of stations of route from A-point to B-point.

* JMR station

Station		Latitude (S)			Longitude (E)		Elevation (m)
A-point	*	73 °	00 '	13 "	44 °	48 '	28 "	3066
A- 5		72	58	01	44	58	27	3038
A- 10		72	55	49	44	58	26	3046
A- 15		72	53	34	44	58	25	3021
A- 20		72	51	22	44	58	25	3011
A- 25		72	49	10	44	58	24	2993
A- 30		72	46	58	44	58	23	2977
A- 35	*	72	44	47	44	58	22	2983
A- 40		72	42	33	44	56	53	2972
A- 45		72	40	19	44	55	24	2955
A- 50		72	38	05	44	53	55	2953
A- 55		72	35	51	44	52	26	2942
A- 60		72	33	37	44	50	57	2915
A- 65		72	31	23	44	49	28	2909
A- 70		72	29	09	44	47	59	2905
A- 75	*	72	26	55	44	46	30	2894
A- 80		72	24	23	44	47	57	2879
A- 85		72	21	51	44	49	25	2865
A- 90		72	19	20	44	50	52	2841
A- 95		72	16	48	44	52	19	2826
A-100		72	14	16	44	53	47	2802
A-105		72	11	44	44	55	14	2794
A-110		72	09	12	44	56	41	2783
A-115		72	06	41	44	58	09	2775
B-point	*	72	05	55	44	58	35	2771

Table II-3. Position and elevation of stations of Route E.

* JMR station

Station		Latitude (S)			Longitude (E)		Elevation (m)
B-point	*	72 °	05 '	55 "	44 °	58 '	35 "	2771
E- 1		72	04	52	44	57	52	2764
E- 2		72	03	50	44	57	13	
E- 3		72	02	46	44	56	52	2749
E- 4		72	01	42	44	56	42	
E- 5		72	00	39	44	55	52	2741
E- 6		71	59	36	44	55	24	
E- 7		71	58	32	44	55	06	
E- 8		71	57	29	44	54	34	2720
E- 9		71	56	25	44	54	02	
E- 10		71	55	21	44	53	49	2708
E- 11		71	54	18	44	53	21	
E- 12		71	53	16	44	52	31	
E- 13		71	52	12	44	52	00	2698
E- 14		71	51	08	44	51	46	
E- 15		71	50	05	44	51	11	2681
E- 16		71	49	02	44	50	43	
E- 17		71	48	00	44	49	47	
E- 18		71	46	58	44	49	08	2666
E- 19	*	71	45	54	44	48	33	2645
E- 20		71	44	52	44	47	43	2639
E- 21		71	43	55	44	46	09	
E- 22		71	42	52	44	45	33	
E- 23		71	41	48	44	45	18	2616
E- 24		71	40	46	44	44	21	
E- 25		71	39	42	44	43	59	2602
E- 26		71	38	38	44	43	44	
E- 27		71	37	34	44	43	29	
E- 28		71	36	31	44	42	46	2588
E- 29		71	35	28	44	42	10	
E- 30		71	34	24	44	41	38	2578
E- 31		71	33	21	44	41	02	
E- 32		71	32	17	44	40	37	
E- 33		71	31	16	44	39	37	2572
E- 34		71	30	12	44	39	26	
E- 35		71	29	08	44	38	57	2552
E- 36		71	28	04	44	38	28	
E- 37		71	27	01	44	37	59	
E- 38	*	71	25	57	44	37	24	2533
E- 39		71	24	52	44	36	39	
E- 40		71	23	44	44	36	22	2515
E- 41		71	22	37	44	35	44	
E- 42		71	21	31	44	35	06	
E- 43		71	20	25	44	34	25	2509
E- 44		71	19	19	44	33	44	
E- 45		71	18	12	44	33	16	2494
E- 46		71	17	06	44	32	32	
E- 47		71	15	59	44	32	01	

* JMR station

Station		Latitude (S)			Longitude (E)			Elevation (m)
E- 48		71	14	52	44	31	34	2466
E- 49		71	13	45	44	30	56	
E- 50	*	71	12	38	44	30	25	2439
E- 51		71	11	33	44	29	51	
E- 52		71	10	28	44	29	01	
E- 53		71	09	23	44	28	27	2427
E- 54		71	08	17	44	27	57	
E- 55		71	07	12	44	27	20	2415
E- 56		71	06	06	44	26	43	
E- 57		71	05	01	44	26	06	
E- 58		71	03	56	44	25	26	2395
E- 59		71	02	50	44	24	56	
E- 60		71	01	44	44	24	26	2374
E- 61		71	00	39	44	23	46	
E- 62(C)	*	70	59	34	44	23	06	2374
E- 63		70	58	38	44	22	22	
E- 64		70	57	40	44	21	55	
E- 65		70	56	43	44	21	27	2366
E- 66		70	55	46	44	21	00	
E- 67		70	54	49	44	20	33	
E- 68		70	53	53	44	19	49	
E- 69		70	52	55	44	19	28	
E- 70		70	51	58	44	19	01	2332
E- 71		70	51	02	44	18	17	
E- 72		70	50	05	44	17	48	
E- 73		70	49	08	44	17	33	
E- 74		70	48	10	44	17	06	
E- 75		70	47	15	44	16	19	2280
E- 76		70	46	18	44	15	52	
IM 3		70	45	14	44	15	22	2265

Table II-4. Position and elevation of Route NY (NY100-135).

* JMR station

Station	Latitude (S)			Longitude (E)			Elevation (m)
NY100(G15)*	71 °	11 '	39 "	45 °	58 '	41 "	2582
NY 101	71	12	21	45	01	11	2587
NY 102	71	13	05	46	03	38	2593
NY 103	71	13	33	46	06	37	2597
NY 104	71	14	19	46	08	42	2605
NY 105	71	14	59	46	11	14	2612
NY 106	71	15	45	46	13	42	2615
NY 107	71	16	22	46	16	26	2621
NY 108	71	17	01	46	19	07	2623
NY 109	71	17	39	46	21	49	2629
NY 110	71	18	18	46	24	24	2636
NY 111	71	18	55	46	27	06	2642
NY 112	71	19	33	46	29	51	2648
NY 113	71	20	11	46	32	32	2653
NY 114	71	20	47	46	35	07	2660
NY 115 *	71	21	14	46	37	47	2666
NY 116	71	21	49	46	40	25	2669
NY 117	71	22	24	46	43	16	2674
NY 118	71	22	01	46	46	01	2680
NY 119	71	23	38	46	48	47	2689
NY 120	71	24	14	46	51	34	2692
NY 121	71	24	45	46	54	31	2696
NY 122	71	25	22	46	57	10	2699
NY 123	71	26	01	46	59	52	2701
NY 124	71	26	33	47	02	35	2704
NY 125	71	27	08	47	05	21	2712
NY 126	71	27	43	47	08	17	2717
NY 127	71	28	18	47	11	01	2723
NY 128	71	28	52	47	13	53	2731
NY 129	71	29	27	47	16	45	2739
NY 130	71	30	04	47	19	31	2747
NY 131	71	30	39	47	22	21	2744
NY 132	71	13	09	47	24	45	2764
NY 133	71	31	44	47	27	37	2773
NY 134	71	23	18	47	30	30	2774
NY135(G17)*	71	32	40	47	34	10	2770

Table II-5. Position and elevation of Routes A and B.

* JMR Station

Station No.	Latitude (S)	Longitude (E)	Altitude (m)
*Asuka Station(A0)	71°31'34"	24° 8'17"	931
A1	71 32 2	24 7 26	
2	71 32 30	24 6 35	930
3	71 32 58	24 5 44	
4	71 33 26	24 4 53	940
5	71 33 54	24 4 2	
6	71 34 23	24 3 11	950
7	71 34 51	24 2 20	
8	71 35 19	24 1 29	970
9	71 35 47	24 0 38	
10	71 36 15	23 59 48	1000
11	71 36 43	23 58 57	
12	71 37 12	23 58 6	1009
13	71 37 40	23 57 15	
14	71 38 8	23 56 23	1029
15	71 38 36	23 55 32	
16	71 39 4	23 54 41	1059
17	71 39 32	23 53 50	
18	71 40 1	23 52 59	1069
19	71 40 29	23 52 8	
20	71 40 57	23 51 17	1079
21	71 41 25	23 50 26	
22	71 41 53	23 49 34	1098
23	71 42 22	23 48 43	
24	71 42 50	23 47 52	1118
25	71 43 18	23 47 1	
26	71 43 46	23 46 9	1138
27	71 44 14	23 45 18	
28	71 44 42	23 44 27	1148
29	71 45 11	23 43 35	
30	71 45 39	23 42 44	1168
31	71 46 7	23 41 53	
32	71 46 35	23 41 1	1168
33	71 47 3	23 40 10	
34	71 47 31	23 39 18	1171
35	71 48 0	23 38 27	
36	71 48 28	23 37 35	1217
37	71 48 56	23 36 44	
38	71 49 24	23 35 52	1237
39	71 49 52	23 35 1	
A40	71 50 21	23 34 9	1227
B1	71 50 43	23 32 54	
B2	71 51 6	23 31 39	1237

* JMR Station

Station No.	Latitude (S)	Longitude (E)	Altitude (m)
B3	71 51 29	23 30 25	
4	71 51 52	23 29 10	1266
5	71 52 15	23 27 55	
6	71 52 38	23 26 40	1256
7	71 53 1	23 25 25	
8	71 53 24	23 24 10	1296
9	71 53 47	23 22 54	
10	71 54 10	23 21 39	1296
11	71 54 31	23 20 21	
12	71 54 53	23 19 3	1296
13	71 55 15	23 17 44	
14	71 55 37	23 16 26	1316
15	71 55 59	23 15 8	
16	71 56 21	23 13 49	1325
17	71 56 43	23 12 31	
18	71 57 5	23 11 12	1355
19	71 57 27	23 9 54	
20	71 57 49	23 8 35	1355
21	71 58 10	23 7 17	
22	71 58 32	23 5 58	1415
23	71 58 54	23 4 39	
24	71 59 16	23 3 21	1395
25	71 59 38	23 2 2	
B26	72 0 0	23 0 43	1414
A70	72 0 13	22 59 55	1434
71	72 0 18	22 58 9	
72	72 0 24	22 56 23	1444
*73	72 0 45	22 55 2	1460
73'	72 1 24	22 54 20	
74	72 1 23	22 53 25	1470
75	72 1 24	22 51 40	
76	72 1 25	22 49 54	1503
77	72 1 26	22 48 8	
78	72 1 27	22 46 22	1556
A79	72 1 28	22 44 36	
*B36	72 1 13	22 44 4	1561
37	72 0 44	22 43 4	
38	72 0 16	22 42 5	1545
39	71 59 49	22 41 7	
40	71 59 21	22 40 8	1529
41	71 58 54	22 39 9	
42	71 58 26	22 38 10	1493
43	71 57 59	22 37 12	
B44	71 57 31	22 36 13	1497

* JMR Station

Station No.	Latitude (S)	Longitude (E)	Altitude (m)
B45	71 57 4	22 35 14	
46	71 56 36	22 34 16	1481
47	71 56 9	22 33 17	
*48	71 55 42	22 32 19	1405
49	71 55 15	22 31 14	
50	71 54 50	22 30 10	1406
51	71 55 9	22 28 42	
52	71 55 28	22 27 15	1417
53	71 55 47	22 25 47	
54	71 56 6	22 24 20	1438
55	71 56 25	22 22 53	
56	71 56 45	22 21 25	1429
57	71 57 4	22 19 58	
58	71 57 23	22 18 30	1450
59	71 57 42	22 17 2	
60	71 58 1	22 15 35	1461
61	71 58 20	22 14 7	
62	71 58 40	22 12 40	1462
63	71 58 59	22 11 12	
64	71 59 18	22 9 44	1453
65	71 59 37	22 8 17	
66	72 0 9	22 8 13	1444
67	72 0 42	22 8 10	
68	72 1 14	22 8 7	1425
69	72 1 47	22 8 3	
70	72 2 19	22 8 0	1436
71	72 2 52	22 7 57	
72	72 3 24	22 7 53	1527
73	72 3 57	22 7 50	
74	72 4 29	22 7 47	1529
75	72 5 2	22 7 43	
76	72 5 34	22 7 40	1550
77	72 6 7	22 7 37	
78	72 6 39	22 7 33	1561
79	72 7 11	22 7 30	
80	72 7 44	22 7 27	1582
81	72 8 16	22 7 23	
82	72 8 49	22 7 31	1663
83	72 9 21	22 7 39	
84	72 9 53	22 7 46	1684
85	72 10 26	22 7 54	
86	72 10 58	22 8 2	1685
87	72 11 30	22 8 9	
B88	72 12 2	22 8 17	1686

* JMR Station

Station No.	Latitude (S)	Longitude (E)	Altitude (m)
B89	72 12 35	22 8 25	
90	72 13 7	22 8 32	1717
91	72 13 39	22 8 40	
92	72 14 12	22 8 48	1748
93	72 14 44	22 8 56	
94	72 15 16	22 9 3	1749
95	72 15 48	22 9 11	
96	72 16 21	22 9 19	1840
97	72 16 53	22 9 27	
98	72 17 25	22 9 34	1851
99	72 17 57	22 9 42	
100	72 18 0	22 11 24	1842
101	72 18 2	22 13 7	
102	72 18 5	22 14 49	1843
103	72 18 7	22 16 32	
104	72 18 10	22 18 14	1844
105	72 18 12	22 19 57	
106	72 18 15	22 21 39	1845
107	72 18 17	22 23 22	
108	72 18 43	22 24 24	1816
109	72 19 8	22 25 26	
110	72 19 10	22 27 8	1818
111	72 19 5	22 29 0	
B112	72 19 1	22 30 42	
*A118	72 19 13	22 32 7	1820
119			
120			1957
121			
122			2045
123			
124			2083
125			
126			2151
127			
128			2179
129	72 20 49	22 49 34	
130	72 21 19	22 50 15	2186
130	72 21 45	22 50 56	
131	72 21 48	22 51 1	
132	72 22 18	22 51 46	2244
133	72 22 49	22 52 13	
134	72 23 20	22 52 44	2282
135	72 23 49	22 53 35	
A136	72 24 20	22 54 3	2310

* JMR Station

Station No.	Latitude (S)	Longitude (E)	Altitude (m)
A137	72 24 51	22 54 37	
138	72 25 21	22 55 11	2327
139	72 25 52	22 55 46	
140	72 26 23	22 56 20	2325
141	72 26 11	22 58 0	
142	72 25 58	22 59 41	2343
143	72 25 46	23 1 21	
144	72 25 34	23 3 2	2371
145	72 25 22	23 4 42	
146	72 25 10	23 6 22	2379
147	72 24 58	23 8 3	
148	72 24 46	23 9 43	2396
149	72 24 34	23 11 23	
150	72 24 22	23 13 4	2404
151	72 24 10	23 14 44	
152	72 23 58	23 16 24	2412
153	72 23 45	23 18 4	
154	72 23 33	23 19 44	2400
155	72 23 21	23 21 25	
156	72 23 9	23 23 5	2398
157	72 22 57	23 24 45	
158	72 22 45	23 26 25	2405
159	72 22 33	23 28 5	
160	72 22 21	23 29 45	2383
161	72 22 9	23 31 25	
162	72 21 57	23 33 5	2391
163	72 21 45	23 34 45	
164	72 21 33	23 36 25	2389
*165	72 21 21	23 38 6	2398
166	72 21 8	23 39 45	2404
167	72 20 55	23 41 25	
168	72 20 43	23 43 5	2396
169	72 20 30	23 44 45	
170	72 20 18	23 46 25	2399
171	72 20 5	23 48 5	
172	72 19 53	23 49 45	2391
173	72 19 40	23 51 25	
174	72 19 28	23 53 5	2404
175	72 19 15	23 54 44	
176	72 19 3	23 56 24	2416
177	72 18 50	23 58 4	
178	72 18 38	23 59 44	2409
179	72 18 25	24 1 24	
180	72 18 13	24 3 3	2381
A181	72 18 23	24 4 45	

* JMR Station

Station No.	Latitude (S)	Longitude (E)	Altitude (m)
A182	72 18 33	24 6 27	2384
183	72 18 43	24 8 8	
184	72 18 53	24 9 50	2336
185	72 18 42	24 11 32	
186	72 18 52	24 13 14	2358
*187	72 19 23	24 13 45	2370
188	72 19 55	24 13 49	2387
189	72 20 28	24 13 54	
190	72 21 0	24 13 58	2430
191	72 21 33	24 14 3	
192	72 22 6	24 14 8	2484
193	72 22 38	24 14 12	
194	72 23 11	24 14 17	2538
195	72 23 43	24 14 22	
196	72 24 16	24 14 26	2552
197	72 24 48	24 14 31	
198	72 25 21	24 14 36	2576
199	72 25 53	24 14 41	
200	72 26 26	24 14 45	2589
201	72 26 59	24 14 42	
202	72 27 31	24 14 40	2583
203	72 28 3	24 14 37	
204	72 28 36	24 14 34	2607
205	72 29 8	24 14 31	
206	72 29 41	24 14 29	2621
207	72 30 13	24 14 26	
208	72 30 46	24 14 23	2625
209	72 31 18	24 14 20	
210	72 31 51	24 14 17	2628
211	72 32 23	24 14 15	
212	72 32 56	24 14 12	2642
213	72 33 28	24 14 9	
214	72 34 1	24 14 6	2636
215	72 34 33	24 14 3	
216	72 35 6	24 14 1	2655
216'	72 35 19	24 14 2	
217	72 35 38	24 13 57	
218	72 36 10	24 13 45	2669
219	72 36 43	24 13 33	
220	72 37 15	24 13 20	2677
221	72 37 47	24 13 8	
222	72 38 19	24 12 56	2691
223	72 38 51	24 12 44	
224	72 39 23	24 12 31	2695
A225	72 39 56	24 12 19	

* JMR Station

Station No.	Latitude (S)	Longitude (E)	Altitude (m)
A226	72 40 28	24 12 7	2709
227	72 41 0	24 11 55	
228	72 41 32	24 11 43	2713
229	72 42 4	24 11 30	
230	72 42 36	24 11 18	2726
231	72 43 8	24 11 1	
232	72 43 40	24 10 44	2740
*233	72 44 13	24 10 27	2733
234	72 44 43	24 10 10	2783
235	72 45 13	24 10 45	
236	72 45 43	24 11 20	2806
237	72 46 17	24 11 58	
238	72 46 47	24 12 33	2808
239	72 47 20	24 13 11	
240	72 47 50	24 13 46	2831
241	72 48 21	24 14 21	
242	72 48 51	24 14 56	2853
243	72 49 21	24 15 31	
244	72 49 51	24 16 6	2846
245	72 50 22	24 15 44	
246	72 50 52	24 15 22	2848
*A246'	72 50 55	24 15 24	2849

III. Surface Meteorological Data during Oversnow Traverses

Syowa Party observers: Tetsuro UEKUBO, Shuji AOKI,
Katsumoto SEKO and Teruo FURUKAWA
Asuka Party observer : Shuji FUJITA

The observations were made during oversnow traverses listed in Tables I-1 and I-2. The item, instrument, and accuracy of the observations are given below.

Item	Instrument	Accuracy
Air temperature	Alcohol or Mercury thermometer	$\pm 0.2°C$
Wind speed	Portable 3-cup anemometer	± 1 $m \cdot s^{-1}$
Wind direction	Magnetic compass	$\pm 5°$
Visibility	Visual observation	------
Cloud	Visual observation	------
Weather	Visual observation	------

The meteorological data are shown in Tables III-1~III-5 corresponding to each traverse. Notations in the tables are as follows.

LT : Local standard time at Syowa Station (GMT+3h)

Ta : Air temperature (°C)

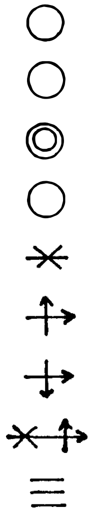
WS : Wind speed (m/s)

WD : Wind direction

V : Visibility

N : Amount of cloud (in tenth)

W : Present weather



Clear

Fine

Cloudy

Cloudy (upper cloud are predominant)

Snow

Blowing snow

Drifting snow

Snowstorm

Ice fog

Position and elevation of stations are given in Table II. For Route S-H-Z refer to Naruse and Yokoyama (1975), for Route IM, to Fujii et al.(1986), for Route NY (from Mizuho Station to G15), to Nishio and Ohmae(1989).

References

Naruse, R. and Yokoyama, K. (1975): Position, elevation and ice thickness of stations. JARE Data Rep., 28 (Glaciol. 3), 7-47.

Fujii, Y., Kawada, K., Yoshida, M. and Matsumoto, S. (1986): Position, elevation and ice thickness of stations. JARE Data Rep., 116 (Glaciol. 13), 5-27.

Nishio, F. and Ohmae, H. (1989): Position, elevation, ice thickness and bedrock elevation of stations along the routes. JARE Data Rep., 148 (Glaciol. 17), 4-41.

Table III-1. Surface meteorological data along route between Syowa and Mizuho Stations during August-September 1988.

Date	LT	Station	WD	WS (m/S)	Ta (°C)	V (km)	N	W
1988								
Aug.23	1500	S 22	NE	13	-14.5	30	10	◎
	1800	H 12	NE	15	-19.5	30	10	◎
	2100	H 12	E	9	-20.5	30	10	◎
24	700	H 12	E	8	-28.5	30	4	○
	900	H 12	E	7	-27.5	30	4	○
	1200	H 86	ENE	6	-28.5	30	5	○
	1500	H 98	E	7	-31.5	30	9	◎
	1800	H 145	E	11	-31.5	30	9	◎
25	600	H 145	E	8	-29.0	0.4	10	→
	900	H 163	E	9	-27.0	1	10	→
	1200	H 207	E	10	-29.0	0.1	2	→
	1500	H 222	E	10	-29.5	1	9	→
	1800	H 255	E	10	-31.0	0.1	8	→
	2100	H 255	E	10	-31.0	-	-	→
26	600	H 255	E	11	-29.0	0.1	10	→
	900	H 255	E	13	-30.0	0.2	10	→
	1200	H 280	E	14	-31.0	0.1	10	→
	1500	H 291	E	14	-32.5	0.1	8	→
	1800	Z 8	E	11	-34.5	0.5	1	→
	2100	Z 8	E	11	-34.0	0.1	0	→
27	600	Z 8	E	12	-36.5	0.1	0	→
	900	Z 11'	E	8	-36.0	0.2	0	→
	1200	Z 29'	E	12	-35.5	0.2	0	→
	1500	Z 40	E	11	-36.0	0.2	0	→
	1800	Z 63	E	11	-39.0	0.2	0	→
28	600	Z 74	E	12	-40.5	0.1	-	→
	900	Z 74	E	13	-39.5	0.1	-	→
	1200	Z 78	E	14	-38.5	0.05	-	→
	1500	Z 96	E	11	-38.0	0.1	0	→
	1800	Mizuho	E	14	-40.5	0.1	-	→
29	900	Mizuho	E	14	-40.5	0.1	8	→
	1200	Mizuho	ESE	13	-41.0	0.15	8	→
	1500	Mizuho	E	13	-41.0	0.15	0+	→
	1800	Mizuho	ESE	14	-41.5	0.1	0	→
30	700	Mizuho	ESE	13	-40.0	0.1	0	→
	900	Mizuho	ESE	12	-39.0	0.1	0	→
	1200	Mizuho	ESE	11	-38.0	0.1	0	→
	1500	Mizuho	E	8	-38.5	2	0+	→
	1800	Mizuho	E	9	-41.0	2	0	→
31	700	Mizuho	E	7	-45.0	30	0	○
	900	Mizuho	E	7	-44.0	30	0	○
	1200	Mizuho	E	7	-43.0	30	0	○
	1500	Z 100'	E	8	-41.5	30	0+	○

Date	LT	Station	WD	WS (m/S)	Ta (°C)	V (km)	N	W
Aug.31	1800	Z 76	ENE	6	-47.5	30	0+	○
	2100	Z 50	ENE	7	-47.5	30	0	○
Sep. 1	700	Z 50	E	7	-48.0	30	0	○
	900	Z 44	E	7	-47.5	2	0	○
	1200	Z 17'	E	8	-44.0	5	0	○
	1500	S 122	E	7	-42.5	5	0	○
	1800	H 278	E	6	-43.0	30	0	○
2	700	H 270	E	5	-39.0	30	2	○
	900	H 270	E	5	-33.5	30	9	◎
	1200	H 222	ENE	9	-26.0	0.15	-	⇸
	1500	H 200	ENE	11	-24.5	0.1	-	⇸
	1800	H 170	E	11	-24.0	0.05	-	⇸
3	700	H 170	ENE	9	-27.0	0.1	-	⇸
	900	H 159	ENE	8	-28.5	0.2	1	○
	1200	H 120	ENE	8	-25.5	0.03	10	◎
	1500	H 90	ENE	9	-25.0	0.1	10	◎
	1800	H 45	E	9	-26.0	0.1	7	◎
4	700	H 45	E	6	-33.0	30	9	◎
	900	H 21	E	8	-32.5	10	0+	○
	1200	S 21	E	7	-28.0	30	0+	○
	1800	S 16	E	7	-28.5	30	9	◎
5	700	S 16	E	7	-25.5	30	10	⦷
	900	S 16	E	7	-24.5	30	8	⦷

Table III-2. Surface meteorological data along routes Syowa Station - Mizuho Station - A.C. - G6 - A - B - C - Mizuho Station - Syowa Station during October-December 1988.

Date	LT	Station	WD	WS (m/S)	Ta (°C)	V (km)	N	W
1988								
Oct. 3	900		E	7	-	40	8	○
	1110	S 16	E	7	-15.4	40	-	⦷
	1315	S 25	ENE	4	-	40	-	⦷
	1610	H 72	E	4	-21.5	50	10	⦷
	2130	H 100	E	9	-25.5	40	10	⦷
4	830	H 100	E	11	-25.9	1	10	⦷
	1400	H 185	E	11	-20.5	20	8	⦶
	1800	H 253	E	12	-27.0	0.8	4	⦶
5	600	H 253	E	17	-31.0	50	0+	○
	900	H 276	E	18	-29.5	50	0+	○
	1200	S 122	ENE	17	-28.5	-	2	⦶
	1500	Z 25	E	16	-29.3	50	8	⦶
	2100	Z 52	E	12	-37.5	40	4	⦶
6	640	Z 52	E	13	-37.5	1	10-	⦷
	900	Z 70	E	15	-34.8	3	10-	⦷
	1000	Z 83		13	-33.8			
	1100	Z 89		15	-33.0			
	1200	Z 98		14	-31.6		10-	
	1500	Mizuho	E	11	-31.5	20	10-	
	2100	IM 1	ENE	11	-36.0	20	9	⦷
7	900	IM 1	E	12	-34.6	0.4	10	↠
	1500	IM 15	E	9	-31.9	40	0+	○
	2100	IM 21'	ENE	6	-33.6	5	4	⦶
8	900	IM 21	ESE	10	-34.2	0.1	X	↠
	1500	IM 21	ESE	8	-33.3	1	2	⦶
	2150	IM 21	ESE	11	-41.6	0.3	0	↠
9	900	IM 21	ENE	13	-38.5	0.15	10	↠
	1500	IM 21	E	15	-33.0	0.1	10	↠
	2100	IM 21	ESE	16	-39.7	0.02	10	↠
10	900	IM 21	ESE	15	-38.0	0.05	10	↠
	1240	IM 21	ESE	13	-34.7	0.1	10	↠
	1500	IM 21	ESE	12	-34.7	0.15	10	↠
	2100	IM 21	ESE	12	-40.1	0.4	0+	↠
11	900	IM 21	ESE	12	-37.5	0.15	10	↠
	1500	IM 21	E	11	-32.8	0.4	0	↠
	2100	IM 35'	E	12	-39.6	0.5	0	↠
12	900	IM 35'	E	10	-36.8	0.5	0	○
	1500	IM 45	E	8	-30.6	2	0+	○
	2100	IM 53'	ESE	8	-36.0	2	0+	○
13	900	IM 53'	E	9	-33.0	0.2	10	≡
	1500	IM 64	E	8	-29.0	40	1	○
	2100		ESE	7	-33.0	0.8	10-	⦷

Date	LT	Station	WD	WS (m/S)	Ta (°C)	V (km)	N	W
Oct.14	900		E	9	-32.0	0.2	X	≡
	1500	IM 81	ESE	10	-27.6	1.5	0+	○
	2100	IM 97'	E	7	-28.5	3	10	◎
15	900	IM 97'	E	11	-30.5	0.3	10-	= ≡
	1500	IM 104'	E	11	-28.5	0.3	10-	—
	2100	IM 108'	E	8	-31.0	0.3	10	⇸
16	900	IM 108'	ESE	8	-34.9	0.3	10-	⇸
	1500		ESE	8	-33.0	1.5	10	⋇
	2220	IM 127	ESE	7	-40.5	20	3	⦶
17	900	IM 127	ESE	8	-38.5	40	0	○
	1500	IM 139	ESE	6	-36.3	40	0+	○
	2100	IM 147	ES	11	-47.2	1.5	0	○
	2230	IM 147			-50.0			
18	330	IM 147			-51.0			
	900	IM 147	ES	12	-47.2	0.3	10	⇸
	1600	IM 153	ESE	11	-42.8	0.15	10	⇸
	2100	IM 157	ESE	12	-46.0	0.4	0	⇸
19	1000	IM 157	E	11	-41.5	0.2	10	⇸
	1600	IM 157	E	9	-37.0	0.4	10	⇸
	2100	IM 157	ESE	5	-42.9	10	4	⦷
20	900	IM 157	ESE	8	-40.0	0.4	10	⦷
	1500	IM 157	ESE	7	-33.0	3	10-	⦷
	2100	IM 157	ESE	7	-41.5	1	2	⦶
21	900	IM 157	ESE	7	-39.0	0.4	10	⇸
	1500	IM 157	ESE	7	-32.5	1.5	10	⦷
	2100	IM 157	ESE	8	-36.5	2	8	⦷
22	900	IM 157	ESE	7	-36.1	1	7	⇸
	1200	IM 160	ESE	7	-34.4	1	5	⇸
	1500	IM 167	ESE	7	-34.6	1	1	⇸
	1800	IM 173	ESE	5	-36.2	10	2	⇸
	2100	IM 176'	ESE	6	-39.6	10	3	⇸
23	900	IM 177	E	6	-34.0	0.5	10-	⇸
	1200	IM 181	E	6	-33.4	1	2	⇸
	1500	IM 186'	E	5	-33.7	30	1	○
	1800	IM 180	E	4	-35.6	30	4	⦶
	2100	IM 176'	E	4	-35.7	10	10-	◎
24	900	IM 176'	ESE	7	-39.1	0.3	0	⇸
	1200	IM 180	E	7	-35.8	0.5	3	⇸
	1500	IM 186'	E	8	-35.6	0.5	4	⇸
	1800	IM 192	E	8	-35.6	0.3	10-	⇸
	2130	IM 194'	E	8	-39.0	0.3	3	⇸

Date	LT	Station	WD	WS (m/S)	Ta (°C)	V (km)	N	W
Oct.25	1500	IM 201	E	11	-30.6	0.3	8	↟→
	1800	IM 202'	E	11	-31.7	0.1	10-	↟→
	2100	IM 202'	E	9	-32.6	0.3	10	↟→
26	930	IM 202'	E	10	-31.1	5	10-	↡→
	1200	IM 205	E	9	-29.2	10	10-	◎
	1500	IM 213	E	6	-28.5	10	10-	⦷
	1800		E	6	-30.5	30	10-	⦷
	2230	IM 226'	E	7	-33.9	10	9	◎
27	930	IM 226'	E	8	-34.1	10	4	⦶
	1200	IM 231	E	10	-31.5	10	6	⦶
	1500	IM 240	E	9	-30.5	10	4	⦶
	1830	IM 246	E	8	-32.6	10	2	⦶
	2245	A.C.	E	6	-38.2	30	3	⦶
28	1200	A.C.	E	7	-33.4	5	6	○
	1500	A.C.	E	7	-32.6	30	3	○
	2130	A.C.	E	5	-39.5	30	3	⦶
29	1200	A.C.	E	7	-35.5	10	2	⦶
	1500	A.C.	E	7	-33.5	10	3	⦶
	1800	A.C.	E	6	-34.8	30	4	⦶
	2100	A.C.	E	3	-38.5	30	3	⦶
	2400	A.C.	E	5	-42.9	30	1	○
30	900	A.C.	E	6	-37.9	10	1	○
	1200	A.C.	E	7	-35.2	10	1	○
	1500	A.C.	E	6	-33.6	30	1	○
	1800	A.C.	E	7	-35.6	30	0+	○
	2100	A.C.	E	7	-39.4	30	0	○
	2400	A.C.	E	7	-44.7	30	0	○
31	1200	A.C.	ESE	8	-37.0	0.5	0	○
	1500	A.C.	ESE	8	-36.1	0.5	0	○
	2100	A.C.	ESE	8	-39.6	10	0	○
Nov. 1	900	A.C.	ESE	8	-38.4	5	0	○
	1500	IM 242	E	9	-30.7	30	0+	○
2	1200	IM 221	E	10	-32.3	1	0	○
	1500	IM 210	E	10	-32.9	10	0	○
	2100	IM 196	E	9	-40.0	10	0	○
3	900	IM 196	E	7	-37.3	10	3	⦶
	1200	IM 196	E	8	-33.0	30	4	⦶
	1500	IM 196	E	8	-32.0	10	4	⦶
	2245	IM 182'	ESE	8	-39.7	5	3	⦶
4	900	IM 182'	ESE	9	-38.4	0.5	X	↟→
	1500	IM 167	ESE	12	-32.6	0.5	10	↟→
	2140	IM 157	ESE	16	-36.0	0.1	10	↟→

Date	LT	Station	WD	WS (m/S)	Ta (°C)	V (km)	N	W
Nov. 5	900	IM 157	E	18	-31.0	0.05	10	↟
	1500	IM 157	E	17	-28.0	0.05	10	↟
	2100	IM 157	E	13	-30.5	0.1	10	↟
6	900	IM 157	ESE	14	-30.5	0.15	10	↟
	1520	IM 157	E	11	-28.2	0.3	10	↟
	2100	IM 157	E	8	-34.3	4	10-	↟
7	900	IM 157	E	9	-35.2	20	2	⦶
	1500	IM 157	E	8	-29.5	20	1	○
8	200	IM 157	ESE	9	-39.5	6	0+	○
	900	IM 157	ESE	10	-34.8	1	0+	○
	1500	G- 10	E	10	-29.0	4	0+	○
	2100	G- 35	ESE	9	-35.2	15	1	○
9	900	G- 37	ESE	9	-34.5	1.5	0	○
	1500	G- 65	E	12	-30.2	0.9	0	○
	2100	G- 85	ESE	12	-35.2	2	0	○
10	900	G- 85	ESE	10	-33.2	5	0	○
	1040	G- 90	ESE	10	-29.8	1.5	0	○
	1140	G- 95	ESE	11	-29.0	4	0	○
	1500	G-100	ESE	10	-29.0	15	0	○
	1555	G-105	ESE	9	-29.0	15	0	○
	1755	G-115	ESE	7	-30.2	30	0	○
	1955	G-125	ESE	5	-32.9	50	2	○
	2100	G-125	ESE	6	-35.2	30	0+	○
11	900	G-125	ESE	9	-34.1	4	1	○
	1251	G-135	ESE	11	-31.0	15	0+	○
	1425	G-145	ESE	9	-30.5	15	0+	○
	1500	G-150	ESE	10	-29.8	15	0+	○
	1608	G-155	ESE	8	-31.2	15	0	○
	1825	G-165	ESE	7	-33.0	20	0	○
	2120	A	ESE	6	-36.0	20	0	○
12	940	A	ESE	9	-34.2	2	0	○
	1540	A	ESE	12	-30.7	3	0	○
	2100	A	ESE	8	-36.2	3	0+	○
13	900	A	ESE	11	-36.0	0.4	10	↟
	1500	A	E	13	-32.9	0.3	10	↟
	2100	A	ESE	9	-36.9	1	0	○
14	900	A	E	12	-35.9	0.4	10	↟
	1500	A	ESE	11	-33.0	0.4	10	↟
	2100	A	ESE	7	-36.9	1.5	8	⦶
15	900	A	E	7	-35.2	1.3	0	○
	1500	A	E	5	-31.0	10	0+	○
	2100	A	ESE	3	-36.7	20	7	✳

Date	LT	Station	WD	WS (m/S)	Ta (°C)	V (km)	N	W
Nov.16	900	A	ESE	5	-36.4	30	0	○
	1300	A- 5	ESE	6	-32.0	50	0	○
	1500	A- 15	ESE	7	-29.1	50	0	○
	1630	A- 25	ES	8	-29.5	50	0	○
	1850	A- 35	ESE	4	-32.7	50	0	○
	2100	A- 35	ES	4	-35.1	50	0	○
17	130	A- 35	ES	8	-41.0	20	0	○
	1030	A- 35	ESE	9	-33.9	0.8	0	○
	1120	A- 45	ESE	10	-31.0	1	0	○
	1200	A- 55	ESE	10	-29.5	1.3	0+	○
	1500	A- 60	ESE	9	-28.7	3	1	○
	1630	A- 65	ES	6	-28.7		0	○
	2100	A- 75	ES	6	-34.9	50	0	○
18	900	A- 75	E	13	-31.9	0.3	10	↑→
	1250	A- 85	ESE	14	-28.9	0.3	10	↑→
	1500	A- 95	E	11	-27.1	0.8	1	↓→
	1736	A-105	E	7	-27.9	15	0+	○
	1820	A-115	ESE	7	-30.0	50	1	○
	2100	A-115	ESE	7	-30.5	50	1	○
19	950	B	ESE	8	-28.6	50	0+	○
	1500	B	E	4	-25.0	50	0	○
	2220	B	ES	4	-35.4	30	0	○
20	1010	B	ESE	6	-29.5	30	0	○
	1500	B	E	7	-24.6	50	0	○
	2100	B	E	6	-31.0	50	0+	○
21	930	B	ESE	8	-29.7	10	10-	⦷
	1200	E- 3	E	9	-27.0	20	10-	⦷
	1400	E- 8	E	9	-25.9	20	10-	⦷
	1500	E-10	E	8	-24.8	20	10-	⦷
	1740	E-13	E	7	-26.3	20	6	⦶
	1850	E-18	E	5	-28.3	20	9	⦷
	2100	E-19	ESE	5	-30.9	30	10-	○
22	900	E-19	E	4	-26.7	8	10	✱
	1130	E-23	ENE	6	-26.0	10	10-	✱
	1400	E-28	ENE	7	-22.8	7	2	✱
	1500	E-30	ENE	4	-25.0	10	10	✱
	1730	E-33	ESE	6	-26.2	8	8	○
	2100	E-38	ESE	5	-29.9	50	1	⦶
23	900	E-38	E	10	-27.0	10	0+	○
	1300	E-43	ESE	7	-23.9	30	0+	○
	1400	E-45	E	8	-24.8	30	0+	○
	1500	E-48	E	7	-23.9	30	0+	○
	2100	E-50	ESE	4	-28.5	50	0+	○
24	900	E-50	E	7	-25.0	20	9	⦷
	1115	E-53	ENE	7	-21.5	10	10	✱

Date	LT	Station	WD	WS (m/S)	Ta (°C)	V (km)	N	W
Nov.24	1240	E-55	ENE	7	-21.0	8	10-	*
	1350	E-58	ENE	5	-22.0		10-	*
	1500	E-60	NE	5	-21.0	20	10-	*
	2100	E-62	E	5	-20.5	10	10-	*
25	900	E-62	ENE	10	-20.2	4	10-	*
	1520	E-62	ENE	10	-18.5	0.5	10	*
	2100	E-62	E	9	-21.1	1	10	*
26	800	E-62	E	11	-19.8	0.3	10	*
	900	E-62	ENE	12	-18.5	0.3	10	*
	1200	E-68	ENE	11	-17.2	0.2	10	*
	1410	E-73	ENE	10	-16.8	0.5	10	*
	1500	E-75	ENE	12	-17.0	0.4	10	*
27	1500	Mizuho	ENE	7	-17.5	0.8	10	*
	2100	Mizuho	E	4	-24.5	30	6	⌽
28	900	Mizuho	E	7	-20.5	10	8	⌽
	1600	Mizuho	E	5	-18.3	10	10-	◎
	2100	Mizuho	ESE	5	-24.7	30	2	⌽
29	900	Mizuho	E	11	-19.5	0.4	2	⇸
	1500	Mizuho	ENE	9	-16.5	0.3	10	*
	2100	Mizuho	ENE	5	-18.5	4	10	*
30	900	Mizuho	E	9	-15.5	0.5	10-	⇸
	1500	Z 54	ENE	10	-14.0	0.4	10-	⇸
	2100	Z 30	E	9	-21.1	4	10-	◎
Dec. 1	900	Z 24	ENE	10	-20.5	5	3	⌽
	1500	H 270	ENE	7	-14.8	30	2	⌽
	2145	H 270	E	6	-21.5	50	1	○
2	1030	H 270	ENE	9	-19.2	4	1	○
	1500	H 270	ENE	7	-17.1	30	0+	○
	2100	H 270	E	4	-24.2	50	0	○
3	900	H 270	E	10	-21.7	4	0+	○
	1500	H 100	ENE	7	-15.2	30	1	○
	2100	H 100	E	5	-24.7	50	0+	○
4	900	H 100	NE	7	-20.4	30	0+	○
	1500	S 16	WSW	4	-11.8	50	1	○
	2100	S 16	ESE	3	-17.1	50	0+	○
5	820	S 16	E	4	-14.2	50	1	○

Table III-3. Surface meteorological data along Route NY and Route S-H-Z during December 1988-January 1989.

Date	LT	Station	WD	WS (m/s)	Ta (°C)	V (km)	N	W
1988 Nov.30	1500	NY 10	E	10	-16.0	0.3	10-	+→
Dec. 1	900	NY 16	E	10	-19.0	2	0+	⇣+→
	1500	NY 42	E	10	-17.0	2	10-	⇣+→
2	900	NY 58	E	11	-22.0	1	9	⇣+→
	1500	NY 58	E	12	-18.5	5	2	⇣+→
3	600	NY 58	E	7	-25.5	30	9	⦶
	900	NY 60	E	10	-22.0	2	9	⦶
	1500	NY 83	E	10	-18.5	10	0+	○
4	900	NY 100	E	8	-22.5	30	0	○
	1500	NY 100	E	8	-18.0	30	0	○
5	900	NY 100	E	7	-23.0	30	0+	○
	1500	NY 100	E	5	-20.0	30	0	○
6	900	NY 100	E	6	-25.5	30	0	○
	1500	NY 100	E	5	-20.5	30	0	○
7	900	NY 100	ES	3	-22.0	30	1	○
	1500	NY 100	-	0	-16.5	30	9	⦶
8	900	NY 101	E	8	-24.0	30	9	⦶
	1500	NY 115	E	8	-20.5	30	7	⦶
9	900	NY 116	E	7	-25.5	30	0	⌽
	1500	NY 123	E	6	-21.0	30	0	○
10	900	NY 123	E	7	-25.5	30	0	○
	1500	NY 135	ESE	5	-22.0	30	0	○
11	900	NY 135	ESE	4	-25.0	30	0	○
	1500	NY 135	-	0	-24.0	30	0	○
12	900	NY 135	ESE	5	-26.5	30	0	○
	1500	NY 135	ESE	4	-20.5	30	0	○
13	900	NY 135	E	10	-23.5	10	1	○
	1500	NY 135	E	12	-19.0	0.5	9	+→
14	900	NY 135	E	5	-17.0	20	10	⟷
	1500	NY 123	ESE	4	-17.0	30	9	◎
15	900	NY 119	E	4	-21.0	30	0	○
	1500	NY 112	ESE	3	-20.0	30	0	○

Date	LT	Station	WD	WS (m/s)	Ta (°C)	V (km)	N	W
Dec.16	900	NY 110	E	5	-17.0	20	10	◎
	1500	NY 100	E	3	-17.5	30	8	○
17	900	NY 88	E	7	-20.0	2	10	◎
	1500	NY 78	E	6	-18.0	10	10	◎(p)
18	900	NY 75	E	7	-24.0	30	3	⦶
	1500	NY 55	E	6	-20.0	10	4	⦶
19	900	NY 52	E	7	-24.0	30	4	○
	1500	NY 52	ENE	5	-21.0	30	1	○
20	900	NY 52	E	5	-22.0	30	0	○
	1500	NY 52	NE	5	-21.0	30	2	○
21	900	NY 52	E	4	-20.5	30	2	○
	1500	NY 26	ENE	4	-20.0	30	9	◎
22	900	NY 26	E	6	-24.0	30	0	○
	1500	NY 8	ENE	6	-19.0	30	0	○
23	900	Mizuho	E	6	-20.5	30	0	○
	1500	Mizuho	E	9	-18.0	10	9	◎
24	900	Mizuho	ENE	7	-16.5	1	10	⇸
	1500	Mizuho	NNE	7	-13.0	5	10	⤫
25	900	Mizuho	ENE	8	-15.5	10	9	◎
	1500	Z 46	NNE	3	-12.5	30	9	◎
26	900	Z 36	E	8	-17.0	30	2	○
	1500	Z 4	E	8	-12.0	30	0+	○
27	900	H 280	E	9	-13.5	2	9	⇸
	1500	H 201	ENE	6	-8.5	10	10	◎
28	900	H 179	E	8	-12.5	30	0+	○
	1500	H 100	ENE	7	-8.5	30	0+	○
29	1500	H 50	E	10	-8.0	1	1	⇸
30	900	H 50	E	13	-9.0	0.5	10	⇸
	1500	H 50	ENE	10	-7.0	0.5	10	⇸
31	1500	H 66	NE	5	-7.0	30	9	⦶
1989 Jan. 1	900	H 50	E	8	-10.0	30	4	⦶
	1500	S 25	NE	7	-7.0	30	4	⦶

Table III-4. Surface meteorological data by the meteorite search party during February 10-March 5, 1988.

Date	LT	Station	Ta	WD	WS	V	N	W
Feb.10	21	A58	-12.0	-	3↓	30	9	◎
11	9	A58	-13.0	NE	3	30	10	◎
	21	A94	-13.0	-	3↓	20	10	◎
12	9	A94	-15.0	NE	3↓	30	10	◎
	22	A118	-13.0	-	3↓	30	10	◎
13	9	A118	-9.0	-	3↓	10	10	✱
	22	A118	-14.0	-	3↓	10	10	◎
14	9	A118	-16.0	-	3↓	30	10	◎
	22	A149	-22.0	SSE	6	30	3	◎
15	9	A149	-26.0	SSE	3	30	3	◑
	22	A170	-26.0	E	3↓	30	0	○
16	9	A170	-27.5	E	3↓	30	3	◑
	22	A187	-23.5	E	3↓	2	10	✱
17	9	A187	-24.0	E	3↓	30	10	◎
	22	A187	-20.0	E	3↓	30	10	◎
19	9	A187	-23.0	E		4	10	◎
	21	A187	-18.0	E	10	0.1	10	◎
20	9	A187	-22.0	E	12	0.01	10	⇸
	21	A187	-18.0	E	17	0.005	10	⇸
21	9	A187	-17.0	E	21	0.005	10	⇸
	21	A187	-18.0	E	17	0.005	10	⇸
22	9	A187	-19.0	E	10	0.03	1	⇸
	21	A187	-21.0	E	12	20	1	⇸
23	9	A187	-19.0	E	10	5	1	⇸
	21	A187	-23.0	E	14	10		◑
24	5	A187	-25.0	E	10	30	1	◑
	21	A230	-29.0	E	7	30	0	○
25	9	A230	-30.0	E	7	30	0	○
	21	A233	-31.0	ESE	10	30	0	○
26	9	A233	-29.0	ESE	10	30	0	○
	21	A233	-30.0	ESE	7	30	0	○
27	9	A233	-29.0	ESE	9	30	1	◑
	21	A233	-29.0	ESE	13	3	10	◎
28	9	A233	-29.0	ESE	16	0.005	10	⇸
	21	A233	-29.0	ESE	18	0.005	10	⇸
29	9	A233	-29.0	ESE	18	0.005	10	⇸
	21	A233	-28.0	ESE	16	0.01		⇸
Mar.1	9	A233	-28.0	ESE	14	0.01		⇸
	21	A233	-29.0	ESE	10	0.05	0	⇸
2	9	A233	-33.0	ESE	6	30	1	⇸
	21	A257.6	-29.0	ESE	6	30	0	○
3	9	A257.6		ESE	5	30	0	○
	21	A180		ESE	3↓	30	0	○
4	9	A180		ESE	3↓	30	0	○
	21	A56		ESE	3↓	30	0	○
5	9	A56		ESE	3↓	30	0	○

Table III-5. Surface meteorological data by the meteorite search party during October 15-29, 1988.

Date	LT	Station	Ta	WD	WS	V	N	W
Oct.15	15	B5	-14.5	E	7	30	10	◎
	21	B36	-18.0	ENE	2	5	10	⋇
16	9	A79	-20.4	-	3 ↓	5	10	⋇
	15	A79	-16.6	-	3 ↓	20	10	◎
	21	B42	-20.9	E	3	10	10	◎
17	21	B110	-28.2	ESE	16	30	0	○
18	9	B110	-27.5	SE	13	30	0	○
	21	B110	-29.7	E	20	30	0	○
19	9	B110	-32.0	E	9	30	0+	⦶
	15	B110	-23.0	ESE	2	30	9	◎
	21	BAMSE	-31.5	ESE	3	30	0	○
20	9	BAMSE	-28.5	SSE	3	30	10	◎
	15	A118	-19.7	ESE	8	30	1	⦶
	21	A118	-24.8	ESE	8	30	8	⦶
21	9	A118		ESE	11	30	1	⦶ +→
	15	A118	-18.6	ESE	12	30	1	⦶ +→
	21	A118	-24.3	ESE	15	30	1	⦶ +→
22	9	A118	-24.5	ESE	13	30	0	○
	21	A118	-22.7	ESE	13	30	0	○
23	15	ROYSANE	-16.2	E	8	30	0+	⦶
	21	A118	-23.4	E	12	30	0+	⦶
24	21	A118	-24.7	E	10	30	0	○
25	15	A99	-15.2	S	3 ↓	30	1	⦶
	21	A118	-22.3	E	11	30	8	⦶
26	9	B105	-22.4	ESE	4	30	6	⦶
	15	BAMSE	-12.8	ENE	4	30	7	⦶
	21	BAMSE	-18.3	-	3 ↓	30	8	◎
27	9	B87	-22.5	SSE	7	30	1	⦶
	21	B87	-22.5	SSE	3	30	2	⦶
28	15	B36	-18.0	ESE	3 ↓	30	9	◎
	21	A40	-21.8	ENE	3	20	7	⦶
29	9	A20	-17.5	E	10	0.1	10	⋇

IV. Net Accumulation of Snow along Traverse Routes in Mizuho Plateau

Observers: JARE-26 Yutaka AGETA and others
JARE-27 Fumihiko NISHIO and others
JARE-28 Hirohito OGIRI and others
JARE-29 Yuki MORINAGA and Zhang Wenjing (Summer Party)
JARE-29 Teruo FURUKAWA and others (Wintering Party)

Net accumulation of snow was measured by the snow stake method along several traverse routes of JARE-29 Syowa Party in 1988-1989 as listed in Table I-1, and shown in Fig. A attached at the end of this report.

1. Route S-H-Z

The stake height of the route was measured in January 1988 by JARE-28 and JARE-29 (Summer Party) and in December 1988 by JARE-29. The height differences gave approximately the annual net accumulation along the route, and the results are tabulated in Table IV-1. The positions of the stations are given by Naruse and Yokoyama (1975).

2. Route IM

The latest stake height of the route was measured by JARE-26 in January 1986. Data along Route IM are shown in Table IV-2. The position and elevation of the stations are shown in Fujii *et al*. (1986).

3. Route NY (from Mizuho Station to G15)

The latest traverse was carried out by JARE-27 in March 1986 before a traverse by JARE-29 in December 1988. The net accumulation during the period was obtained and is given in Table IV-3. The positions of stations from Mizuho Station to G15 are given by Nishio and Ohmae (1989).

4. 36-stake farms along Route S-H-Z

The 36-stake farms (100m x 100m in area) established at S16, H68, H180, S122, Z40 and Mizuho Station were measured by JARE-29 three times in 1988. The latest measurements were made by JARE-28 and JARE-29 in January 1988. The results are tabulated in Tables IV-4~IV-9 for S16, H68, H180, S122, Z40 and Mizuho Station.

5. 100-stake rows and a 36-stake farm along Route IM

100-stake rows were established at γ1 (IM80) by JARE-25 in 1984 and Advanced Camp (IM252) by JARE-26 in 1985. A 36-stake farm was set and measured by JARE-26. The latest measurement was carried out by JARE-26 in January 1986. JARE-29 measured these rows and the farm in October 1988. The results are tabulated in Tables IV-10~IV-12.

References

Naruse, R. and Yokoyama, K. (1975): Position, elevation and ice thickness of stations. JARE Data Rep., 28 (Glaciol. 3), 7-47.

Fujii, Y., Kawada, K., Yoshida, M. and Matsumoto, S. (1986):

Position, elevation and ice thickness of stations. JARE Data Rep., 116 (Glaciol. 13), 5-27.
Nishio, F. and Ohmae, H. (1989): Position, elevation ice thickness and bedrock elevation of stations along the routes. JARE Data Rep., 148 (Glaciol. 17), 4-41.

Table IV-1. Net accumulation along Route S-H-Z in 1988.

(cm in depth)

Station No.	Jan.7 1988 -19 – Aug.31 -Sep.4 (229-237days)	Aug.31 -Sep.4 – Nov.15 -18 (72-79)	Nov.15 -18 – Dec.25 -Jan.1 1989 (37-47)	Jan.1988 -Dec.1988 (348-353)
S 16		-7	14	
S 17	18	-6	-10	2
S 18	11	3	-5	9
S 19	16	-6	-3	7
S 20	37	1	0	38
S 21	-45	-5	5	-45
S 22	21	-4	-11	6
S 23	26	-6	-4	16
S 24	27	-5	-3	19
S 25	7	-2	-3	2
S 26	28	-2	-8	18
S 27	34	-12	8	30
S 28	16	-1	-7	8
S 29	29	-7	-6	16
S 30	-40	-2	-1	-43
H 3	21	-3	-3	15
H 9	42	-6	-8	28
H 15	43	-4	-4	35
H 21	22	-3	-3	16
H 27	21	-3	-5	13
H 35	21	-5	5	21
H 42	0	-5	0	-5
H 48	5	-3	-2	0
H 54	20	-2	-7	11
H 60	32	-6	-3	23
H 64	16	8	-3	21
H 68	-1	-1	3	1
H 72	31	-2	-1	28
H 76	9	-2	6	13
H 80	14	-3	-4	7
H 84	7	-2	3	8
H 88	-5	-2	7	0
H 92	7	-2	3	8
H 96	25	-2	-2	21
H100	14	-1	0	13
H104	5	-3	0	2
H108	17	0	-3	14
H112	19	-1	-3	15
H116	2	1	6	9
H120	21	2	-3	20
H124	17	-2	-3	12
H128	34	-1	-2	31
H132	27	-1	-1	25
H136	2	0	-3	-1
H140	16	20	-9	27
H144	12	6	4	22
H148	15	-1	2	16
H152	17	-2	-3	12
H156	5	-2	-6	-3
H160	23	-6	-5	12
H164	37	5	-4	38

(cm in depth)

Station No.	Jan.7 1988 -19	Aug.31 -Sep.4	Nov.15 -18	Dec.25 -Jan.1 1989	Jan.1988 -Dec.1988
	(229-237days)	(72-79)	(37-47)		(348-353)
H168	14	-2	-3		9
H172	2	-1	-1		0
H176	-12	9	-6		-9
H180	25	-4	-1		20
H184	13	-1	2		14
H188	2	1	-2		1
H192	5	7	-1		11
H196	31	11	-4		38
H200	3	0	1		4
H204	13	-3	5		15
H208	6	-1	-1		4
H212	12	0	0		12
H216	19	6	-6		19
H220	14	-1	-1		12
H224	20	-1	3		22
H228	23	-1	-2		20
H232	11	1	-1		11
H236	13	-1	1		13
H240	15	2	2		19
H244	-5	-1	1		-5
H248	22	1	-3		20
H252	3	0	-2		1
H256	12	-1	1		12
H260	31	-1	4		34
H264	17	0	-3		14
H268	11	0	6		17
H272	34	-3	-3		28
H276	7	-6	2		3
H280	29	2	-7		24
H284	10	-1	-3		6
H288	7	0	3		10
H293	3	-1	-3		-1
H297	-2	9	-12		-5
H301	23	-1	-6		16
S122	1	1	-3		-1
Z 2	14	-5	-1		8
Z 4	0	-1	-4		-5
Z 6	-3	0	-3		-6
Z 8	3	0	0		3
Z 10	-1	0	-1		-2
Z 12	7	-1	-1		5
Z 14	14	0	-2		12
Z 16	-3	0	-3		-6
Z 18	-3	0	-1		-4
Z 20	-1	0	-2		-3
Z 22	23	-1	-4		18
Z 24	1	0	-2		-1
Z 26	-1	1	-3		-3
Z 28	-3	0	0		-3
Z 30	-4	-10	7		-7
Z 32	-2	0	-1		-3

(cm in depth)

Station No.	Jan.7 1988 -19 (229-237days)	Aug.31 -Sep.4 (72-79)	Nov.15 -18 (37-47)	Dec.25 -Jan.1 1989	Jan.1988 -Dec.1988 (348-353)
Z 34	12	-1	-2		9
Z 36	-4	-1	0		-5
Z 38	-7	0	-1		-8
Z 40	0	-2	-2		-4
Z 42	7	5	0		12
Z 46	-6	0	-2		-8
Z 50	6	-1	9		14
Z 54	5	-1	-2		2
Z 58	-3	-1	-3		-7
Z 62	-5	-3	7		-1
Z 66	-1	-1	-1		-3
Z 70	-3	1	-3		-5
Z 72	-3	0	2		-1
Z 74	-2	0	3		1
Z 76	8	0	-4		4
Z 78	-1	0	3		2
Z 80	0	0	2		2
Z 82	13	-1	8		20
Z 84	9	-1	-1		7
Z 86	-5	0	-2		-7
Z 88	-1	0	-1		-2
Z 90	-1	0	0		-1
Z 92	2	0	4		6
Z 94	10	-3	39		46
Z 96	28	0	9		37
Z 98	-2	1	-2		-3
Z100	-1	-1	2		0
Z102	-3	0	2		-1

Table IV-2. Net accumulation along Route IM between January 1986 and November 1988.

(cm in depth)

Station No.	Jan.3-14 1986 -Oct.7-Nov.2 1988 (997-1027days)	Station No.	Jan.3-14 1986 -Oct.7-Nov.2 1988 (997-1027days)
IM 1		IM 52	-5
2	3	53	-30
3		54	5
4	6	55	40
5	-3	56	33
6		57	77
7	48	58	46
8	52	59	47
9	21	60	102
10	-8	61	
11	2	62	92
12	32	63	4
13	57	64	56
14	63	65	-3
15	-4	66	8
16	4	67	63
17	-2	68	55
18	30	69	46
19	11	70	67
20	38	71	116
21	42	72	102
22	-6	73	96
23	96	74	40
24	73	75	46
25	60	76	19
26	65	77	
27	2	78	26
28	3	79	-6
29	10	80	
30	5	81	-12
31	10	82	
32	14	83	0
33	-2	84	-2
34	20	85	0
35	48	86	-80
36	31	87	-13
37	38	88	-10
38	-2	89	-3
39	57	90	-7
40	24	91	7
41		92	61
42	50	93	-3
43	30	94	24
44	94	95	14
45		96	64
46		97	48
47		98	21
48	40	99	8
49	67	100	99
50	20	101	66
51	100	102	-

(cm in depth)

Station No.	Jan.3-14 1986 -Oct.7-Nov.2 1988 (997-1027days)	Station No.	Jan.3-14 1986 -Oct.7-Nov.2 1988 (997-1027days)
103		154	41
104		155	36
105		156	5
106		157	96
107		158	3
108	120	159	9
109	73	160	23
110	100	161	4
111	73	162	-6
112	36	163	9
113	97	164	57
114	93	165	27
115	146	166	28
116	66	167	42
117	119	168	28
118	97	169	34
119	121	170	73
120	85	171	24
121	-6	172	41
122	-11	173	48
123	41	174	74
124	0	175	39
125	66	176	14
126	127	177	32
127	-6	178	-2
128	7	179	54
129	69	180	72
130	64	181	65
131	117	182	112
132	94	183	49
133	-9	184	99
134	74	185	73
135	104	186	125
136	77	187	102
137	74	188	64
138	98	189	-9
139	71	190	-11
140	95	191	8
141	119	192	17
142	117	193	24
143	100	194	5
144	104	195	26
145	129	196	10
146	76	197	-3
147	4	198	-8
148	80	199	-6
149	73	200	0
150	82	201	-4
151	7	202	-53
152	4	203	2
153	61	204	3

(cm in depth)

Station No.	Jan.3-14 1986 -Oct.7-Nov.2 1988 (997-1027days)
205	2
206	1
207	-8
208	9
209	62
210	129
211	99
212	27
213	69
214	63
215	12
216	171
217	81
218	96
219	82
220	38
221	79
222	40
223	51
224	25
225	1
226	
227	30
228	2
229	-11
230	16
231	29
232	46
233	96
234	48
235	19
236	88
237	76
238	32
239	29
240	44
241	-1
242	43
243	59
244	63
245	50
246	105
247	81
248	46
249	-11
250	32
251	28
252	48

Table IV-3. Net accumulation along Route NY between March 1986 and December 1988.

(cm in depth)

Station No.	Mar.1986 -Dec.1988 (983-989days)	Station No.	Mar.1986 -Dec.1988 (983-989days)
NY 2	8	NY 52	31
4	12	54	6
6	40	56	47
8	21	58	47
10		60	19
12	-2	62	45
14	30	64	88
16	41	66	48
18	90	68	84
20	53	70	46
22	44	72	52
24	39	74	55
26	-5	76	28
28	12	78	-8
30	76	80	134
32	67	82	79
34	80	84	43
36	116	86	56
38	57	88	53
40	57	90	-6
42	44	92	-6
44	42	94	10
46	68	96	41
48	13	98	31
50	13	100	39

Table IV-4. Net accumulation with a 36-stake farm at S16 in 1988.

(cm in depth)

Stake No.	Jan.7 1988 -Jul.8 (183days)	Jul.8 -Aug.23 (46days)	Aug.23 -Sep.4 (12days)	Sep.4 -Jan.1 1989 (119days)	Jan.7 1988 -Jan.1 1989 (360days)
I - 1	7	-2	-2	-4	-1
- 2	5	-2	0	-7	-4
- 3	-5	-1	-3	-7	-16
- 4	9	1	-2	-10	-2
- 5	14	-3	-1	-10	0
- 6	8	-1	1	7	15
II - 1	4	0	-1	-8	-5
- 2	0	-1	-1	-10	-12
- 3	-19	0	-2	-11	-32
- 4	3	0	-1	-8	-6
- 5	10	-1	-2	-12	-5
- 6	-3	4	-6	0	-5
III - 1	1	0	-1	-7	-7
- 2	2	-3	1	-9	-9
- 3	8	0	0	-7	1
- 4	4	-2	-2	-2	-2
- 5	8	-1	-1	2	8
- 6	7	-1	-2	10	14
IV - 1	14	-2	-1	-18	-7
- 2	21	-2	-1	-13	5
- 3	18	-3	0	-9	6
- 4	11	0	-2	-10	-1
- 5	8	7	-4	-11	0
- 6	10	0	-1	-6	3
V - 1	8	8	-3	-10	3
- 2	14	-10	-1	7	10
- 3	11	-1	-1	-2	7
- 4	9	-1	-1	-6	1
- 5	13	-1	5	-15	2
- 6	9	3	0	-9	3
VI - 1	6	19	-2	-22	1
- 2	10	6	-4	-12	0
- 3	11	1	-2	-10	0
- 4	6	2	0	4	12
- 5	12	-8	4	13	21
- 6	8	0	-2	-9	-3
Mean	7.3	0.1	-1.1	-6.4	-0.1

Table IV-5. Net accumulation with a 36-stake farm at H68 in 1988.

(cm in depth)

Stake No.	Jan.17 1988 -Sep.3 (230days)	Sep.3 -Dec.29 (117days)	Jan.17 1988 -Dec.29 (347days)
I - 1	1	-4	-3
- 2	6	-6	0
- 3	5	-4	1
- 4	5	-8	-3
- 5	4	-4	0
- 6	-2	-5	-7
II - 1	9	-13	-4
- 2	0	-6	-6
- 3	14	-9	5
- 4	-1	-3	-4
- 5	-1	-6	-7
- 6	1	0	1
III - 1	-4	-4	-8
- 2	4	-10	-6
- 3	-1	4	3
- 4	4	-4	0
- 5	3	-10	-7
- 6	-2	-2	-4
IV - 1	0	4	4
- 2	8	-14	-6
- 3	2	-8	-6
- 4	8	-5	3
- 5	8	-5	3
- 6	-6	-3	-9
V - 1	10	1	11
- 2	3	-5	-2
- 3	1	-8	-7
- 4	7	-7	0
- 5	0	2	2
- 6	13	-4	9
VI - 1	9	-4	5
- 2	5	-1	4
- 3	3	11	14
- 4	8	-4	4
- 5	-1	-5	-6
- 6	-8	-4	-12
Mean	3.2	-4.3	-1.1

Table IV-6. Net accumulation with a 36-stake farm at H180 in 1988.

(cm in depth)

Stake No.	Jan.9 1988 -Sep.2 (237days)	Sep.2 -Dec.27 (116days)	Jan.9 -Dec.27 (353days)
I − 1	12	7	19
− 2	39	-7	32
− 3	29	-4	25
− 4	18	0	18
− 5	17	-6	11
− 6	7	-3	4
II − 1	14	-6	8
− 2	22	-4	18
− 3	20	-5	15
− 4	15	-5	10
− 5	16	-1	15
− 6	16	-5	11
III − 1	9	3	12
− 2	9	-4	5
− 3	20	-3	17
− 4	19	-1	18
− 5	10	-5	5
− 6	21	-13	8
IV − 1	5	-5	0
− 2	10	1	11
− 3	4	-4	0
− 4	23	-4	19
− 5	17	-2	15
− 6	11	-2	9
V − 1	13	2	15
− 2	5	0	5
− 3	22	-4	18
− 4	15	2	17
− 5	7	5	12
− 6	8	0	8
VI − 1	14	0	14
− 2	4	-5	-1
− 3	15	-6	9
− 4	21	-6	15
− 5	24	7	31
− 6	24	6	30
Mean	15.4	-2.1	13.3

Table IV-7. Net accumulation with a 36-stake farm at S122 in 1988.

(cm in depth)

Stake No.	Jan.16 1988 -Sep. 1 (229days)	Sep.1 -Oct.5 (34days)	Oct.5 -Dec.26 (82days)	Jan.16 -Dec.26 (345days)
I - 1	2	0	-4	-2
- 2	-1	-1	-3	-5
- 3	2	-1	-3	-2
- 4	-1	0	-2	-3
- 5	6	0	-2	4
- 6	0	-1	2	1
II - 1	2	0	-5	-3
- 2	2	0	-2	0
- 3	7	0	-1	6
- 4	11	-1	-3	7
- 5	-4	-1	1	-4
- 6	7	-1	-8	-2
III - 1	5	0	-8	-3
- 2	0	-1	-3	-4
- 3	-1	-1	-1	-3
- 4	1	0	-4	-3
- 5	0	0	-2	-2
- 6	-2	-1	-4	-7
IV - 1	10	0	-4	6
- 2	-1	0	-3	-4
- 3	5	0	-4	1
- 4	-1	-1	-3	-5
- 5	-7	2	-5	-10
- 6	-1	0	-6	-7
V - 1	4	0	-4	0
- 2	-1	0	-4	-5
- 3	-3	0	-3	-6
- 4	5	-1	-3	1
- 5	0	0	0	0
- 6	11	-1	-1	9
VI - 1	0	-1	-1	-2
- 2	3	0	-2	1
- 3	1	0	-3	-2
- 4	10	0	-1	9
- 5	1	0	0	1
- 6	6	0	2	8
Mean	2.2	-0.3	-2.7	-0.8

Table IV-8. Net accumulation with a 36-stake farm at Z40 in 1988.

(cm in depth)

Stake No.	Jan.15 1988 -Sep. 1 (230days)	Sep.1 -Oct.5 (34days)	Oct.5 -Dec.26 (82days)	Jan.15 -Dec.26 (346days)
I - 1	-2	0	-1	-3
- 2	1	0	1	2
- 3	0	0	4	4
- 4	3	4	3	10
- 5	11	0	6	17
- 6	0	0	-4	-4
II - 1	7	-2	-3	2
- 2	-1	-1	0	-2
- 3	-5	2	0	-3
- 4	-4	1	-4	-7
- 5	-1	1	-3	-3
- 6	-2	0	-2	-4
III - 1	-8	0	-3	-11
- 2	2	0	-1	1
- 3	3	0	-2	1
- 4	-1	0	-1	-2
- 5	10	-15	-4	-9
- 6	10	-1	2	11
IV - 1	-5	1	-2	-6
- 2	0	0	-3	-3
- 3	1	0	-1	0
- 4	2	-1	9	10
- 5	-1	1	-4	-4
- 6	-1	0	-2	-3
V - 1	9	-1	-2	6
- 2	5	0	-1	4
- 3	-1	1	-3	-3
- 4	4	0	-4	0
- 5	0	-1	5	4
- 6	-6	0	-1	-7
VI - 1	-3	-1	5	1
- 2	5	-1	-2	2
- 3	-2	1	-3	-4
- 4	-1	1	4	4
- 5	-2	0	2	0
- 6	-1	0	7	6
Mean	0.7	-0.3	-0.2	0.2

Table IV-9. Net accumulation with a 36-stake farm at Mizuho Station. in 1988.

(cm in depth)

Stake No.	Jan.13 1988 -Aug.30 (230days)	Aug.30 -Dec.24 (116days)	Jan.13 -Dec.24 (346days)
I − 1	-2	0	-2
− 2	0	6	6
− 3	-1	-1	-2
− 4	-2	1	-1
− 5	-1	11	10
− 6	-7	-1	-8
II − 1	-2	6	4
− 2	-4	-2	-6
− 3	-1	6	5
− 4	-2	2	0
− 5	-3	9	6
− 6	-5	11	6
III − 1	-1	-2	-3
− 2	-2	-1	-3
− 3	-2	8	6
− 4	-1	-1	-2
− 5	-1	0	-1
− 6	-2	2	0
IV − 1	-1	-2	-3
− 2	-2	-1	-3
− 3	0	5	5
− 4	-2	-1	-3
− 5	-7	0	-7
− 6	-3	10	7
V − 1	-7	5	-2
− 2	0	-1	-1
− 3	-1	1	0
− 4	-1	-1	-2
− 5	-2	-1	-3
− 6	-2	-1	-3
VI − 1	0	0	0
− 2	-1	9	8
− 3	-6	5	-1
− 4	-3	0	-3
− 5	0	-2	-2
− 6	-3	2	-1
Mean	-2.2	2.3	0.1

Table IV-10. Net accumulation with 100-stake row at γ1 between January 12, 1986 and October 14, 1988.

(cm in depth)

Stake No.	Jan.12 1986 -Oct.14 1988 (1006days)	Stake No.	Jan.12 1986 -Oct.14 1988 (1006days)
1	-11	51	-10
2	-7	52	-17
3	-8	53	-4
4	-8	54	-11
5	-5	55	-15
6	-6	56	-28
7	-8	57	-13
8	-2	58	-8
9	-7	59	-6
10	-9	60	-2
11	-7	61	-5
12	-7	62	-6
13	-13	63	-5
14	-18	64	-10
15	-12	65	3
16	-7	66	-8
17	-5	67	-8
18	-6	68	-9
19	-8	69	-8
20	-7	70	-8
21	-5	71	-11
22	-5	72	-8
23	0	73	-9
24	-9	74	-11
25	1	75	-9
26	-6	76	-4
27	-12	77	-2
28	-14	78	-7
29	-10	79	-12
30	-13	80	-6
31	-4	81	-10
32	-5	82	-8
33	-8	83	8
34	-4	84	-8
35	-11	85	-7
36	-1	86	-13
37	4	87	-10
38	-7	88	-11
39	-7	89	-8
40	-8	90	-4
41	-15	91	-1
42	-8	92	-11
43	-9	93	-7
44	-4	94	-9
45	-11	95	-10
46	-8	96	-14
47	-7	97	-15
48	-5	98	-15
49	-16	99	-6
50	-10	100	-6
		Mean	-8.0

Table IV-11. Net accumulation with 100-stake row at Advance Camp between January 1986 and October 31, 1988.

(cm in depth)

Stake No.	Jan.6 1986 -Oct.31 1988 (1029days)	Stake No.	Jan.6 1986 -Oct.31 1988 (1029days)
1	15	51	-10
2	46	52	27
3	56	53	9
4	58	54	13
5	75	55	21
6	64	56	8
7	65	57	30
8	67	58	25
9	67	59	25
10	58	60	29
11	101	61	21
12	61	62	27
13	54	63	20
14	49	64	24
15	33	65	62
16	20	66	12
17	44	67	24
18	77	68	-3
19	27	69	24
20	20	70	17
21	16	71	28
22	11	72	27
23	62	73	19
24	25	74	-7
25	26	75	9
26	61	76	15
27	18	77	6
28	13	78	19
29	9	79	37
30	58	80	17
31	57	81	40
32	45	82	18
33	37	83	44
34	55	84	41
35	46	85	23
36	40	86	14
37	31	87	13
38	58	88	23
39	0	89	3
40	-9	90	16
41	28	91	38
42	9	92	21
43	22	93	23
44	28	94	5
45	19	95	-1
46	40	96	12
47	48	97	10
48	32	98	73
49	55	99	39
50	28	100	33
		Mean	31.3

Table IV-12. Net accumulation with a 36-stake farm at G6 between January 6, 1986 and November 11, 1988.

(cm in depth)

Stake No.	6 Jan.1986 -11 Nov.1988 (1040days)
I - 1	-14
- 2	20
- 3	41
- 4	22
- 5	50
- 6	32
II - 1	32
- 2	5
- 3	-4
- 4	15
- 5	21
- 6	29
III - 1	4
- 2	22
- 3	10
- 4	4
- 5	7
- 6	25
IV - 1	3
- 2	3
- 3	-7
- 4	-2
- 5	12
- 6	-6
V - 1	5
- 2	5
- 3	17
- 4	-10
- 5	-5
- 6	0
VI - 1	41
- 2	44
- 3	50
- 4	11
- 5	28
- 6	23
Mean	15

V. Net Accumulation of Snow along Traverse Routes around Asuka Station

Observers : Shuji FUJITA and Hiroshi NARAOKA

Net accumulation of snow was measured by the stake method along several traverse routes of JARE-29 Asuka Party in 1988-1989 as listed in Table V and Fig. A.

1. Route RY

Route RY was established by JARE-24 in December 1983 and by JARE-26 in January 1986. The stake height of the route was measured in January 1988 and in April 1988 by JARE-29. The height differences between January 1987 and January 1988 gave approximately the annual net accumulation along the route. Then measurements were carried out from RY 168 to RY 258 (Asuka Station).

The height differences between January 1988 and April 1988 gave approximately 60-80 days net accumulation. Then measurements were made from RY 175 to RY 258. Results are tabulated in Table V-1. The positions and the stations are given in Nakawo et al. (1984), Ageta et al. (1987) and in Nishio and Ohmae (1989).

2. Route L

Route L was established by JARE-25 up to Asuka Station in January 1984. The snow stake height of the route was measured in 1988. The height difference between January 1987 and September 1988 are shown in Table V-2. Measurements were carried out from L 48 to L 120. The positions of the stations were reported by

Nishio and Ohmae (1989).

References

Ageta, Y., Kikuchi, T., Kamiyama, K. and Okuhira, F. (1987): Position, elevation and ice thickness of stations. JARE Data Rep., 125 (Glaciol. 14), 5-29.

Nakawo, M., Narita, H. and Isobe, T. (1984): Position, elevation and ice thickness of stations. JARE Data Rep., 96 (Glaciol. 11), 4-38.

Nishio F. and Ohmae H. (1989): Position, elevation, ice thickness and bedrock elevation of stations along the routes. JARE Data Rap., 148 (Glaciol. 17), 4-41.

Table V-1. Net accumulation along Route RY.

I: bare ice surface
S/I: mixed surface of snow and ice

	Station No.	Jan.1987 -Jan.1988 (351-368days)		Jan.1988 -Apr.1988 (65-88days)	
RY	168	-	I		
	169	-16.0	I		
	170	-14.0	I		
	171	-15.0	I		
	172	-16.0	I		
	173	-17.0	I		
	174	-	I		
	175	-13.0	I	32.0	
	176	-	I	74.0	
	177	-	I	-	
	178	-	I	-	
	179	-	I	-6.0	
	180	-	I	-	
	181	-	I	-4.0	
	182	-	I	10.0	
	183	-20.0		-74.0	
	184	-	I	-5.0	
	185	-	I	-16.0	
	186	-26.0	I	18.0	
	187	-	I	-11.0	
	188	-23.5		45.0	
	189	-14.0	I	29.0	
	190	-19.0	I	8.0	
	191	24.0		29.5	
	192	62.0		5.0	
	193	33.5		0.0	
	194	-26.0		-4.0	
	195	-33.5	I	38.0	
	196	-35.3	I	29.0	
	197	-23.5		17.5	
	198	-1.5		14.5	
	199	27.0	I	10.0	
	200	-22.0	I	-1.0	
	201	-15.0	I	6.5	
	202	-9.0		33.5	
	203	-16.0	I	15.0	
	204	-17.5		14.5	
	205	-18.0		28.5	
	206	-24.0		9.0	
	207	-24.0	I	-1.5	
	208	-36.0	I	5.0	I
	209	-44.5	I	28.0	
	210	-24.5	I	12.0	S/I
	211	-32.0	I	21.5	S/I
	212	-29.0	I	15.0	S/I
	213	-23.0	I	13.0	S/I
	214	-25.0	I	53.0	
	215	-23.0	I	20.0	S/I

	Station No.	Jan.1987 -Jan.1988 (341-350days)	Jan.1988 -Apr.1988 (88-89days)
RY	216	-21.5 I	30.0
	217	-23.5 I	30.5
	218	-19.0 I	15.5 S/I
	219	-20.0 I	-43.5
	220	-20.0 I	35.0
	221	-19.5 I	43.0
	222	-10.0 I	43.0
	223	-22.0 I	8.0
	224	8.5	37.5
	225	10.5	64.0
	226	29.0	49.0
	227	-7.5	29.5
	228	-13.0	76.5
	229	21.0	-16.0
	230	-48.0	69.0
	231	-6.0	67.5
	232	13.0	66.5
	233	-5.0	62.0
	234	34.0	56.0
	235	33.0	29.5
	236	-6.0	116.5
	237	-	56.0
	238	40.0	44.0
	239	-5.0	72.0
	240	3.0	82.5
	241	11.0	86.0
	242	16.0	55.5
	243	34.5	58.0
	244	-8.0	57.0
	245	48.0	-30.5
	246	-11.5	62.0
	247	8.0	47.5
	248	18.0	83.5
	249	19.0	101.0
	250	27.0	69.0
	251	1.5	106.5
	252	17.0	74.5
	253	15.0	71.0
	254	1.5	35.0
	255	24.5	56.0
	256	13.0	49.0
	257	51.0	45.0
	258	-	36.0

Table V-2. Net accumulation along Route L.

	Station No.	Dec.1987 -Spt.1988 (274days)
L	48	122
	50	94
	52	124
	54	100
	56	126
	58	99
	60	125
	62	105
	64	88
	66	129
	68	91
	70	84
	72	88
	74	71
	76	88
	78	70
	80	90
	82	64
	84	106
	86	75
	88	79
	90	87
	92	48
	94	98
	96	69
	98	68
	100	82
	102	46
	104	67
	106	32
	108	78
	110	58
	112	4
	114	26
	116	33
	118	74
	120	45

VI. Net Accumulation of Snow at Asuka Station

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The 36-stake farm (100 m x 100 m in area) established at Asuka Station in 1985, was measured in the period of approximately every one month by JARE-29, and the 16 stake farm (30 m x 30 m in area) established in June 1987 was measured every week, as tabulated in Tables VI-1 and VI-2.

Reference

Nishio, F. and Ohmae, H. (1989): Net accumulation of snow around Asuka Camp in 1987. JARE Data Rep., 148 (Glaciol. 17), 51-57.

Table VI-1. Net accumulation with a 36-stake farm at Asuka Station in 1988.

(cm in depth)

	12/20.1987- 1/20.1988 (31days)	1/20.1988- 2/22.1988 (33days)	2/22.1988- 3/24.1988 (31days)	3/24.1988- 4/21.1988 (29days)	4/21.1988- 5/20.1988 (29days)
I -1	-3.0	7.0	40	6	-9
2	-10.0	43.5	17	-4	1
3	2.5	54.5	-8	-13	-3
4	0.0	23.0	31	-6	-2
5	-3.5	-2.5	96	-8	3
6	5.5	27.0	49	6	4
II -1	6.5	-9.0	40	0	-6
2	5.5	57.0	19	-9	3
3	9.0	36.5	27	-8	-2
4	5.0	7.0	60	-10	-4
5	6.0	-10.0	74	0	-1
6	10.0	42.5	27	5	-2
III -1	-1.5	18.0	33	-17	-3
2	3.0	14.0	63	-17	0
3	6.0	39.0	24	-8	-5
4	14.0	12.0	58	-9	-4
5	16.0	-16.0	87	-30	0
6	12.5	33.0	23	0	-1
IV -1	-2.5	43.5	20	-4	-2
2	2.5	-9.0	73	-4	-2
3	-3.5	34.5	45	-9	-2
4	-6.5	-4.5	80	-28	-2
5	10.0	9.5	62	-9	-1
6	5.5	37.5	18	-7	-1
V -1	8.0	-11.5	81	-10	-2
2	-3.0	-1.0	73	-9	-1
3	5.0	-7.5	91	-2	1
4	-0.5	-12.0	79	-10	0
5	2.5	24.5	56	-12	-2
6	18.0	4.0	20	-18	-1
VI -1	25.5	-12.5	64	-3	-4
2	-4.0	11.0	71	-10	-3
3	0.0	-7.0	79	-6	-14
4	9.5	4.0	67	0	-2
5	14.5	19.5	31	-4	3
6	6.5	-11.5	50	2	-1
Mean	4.8	13.6	50.6	-7.4	-1.9

(cm in depth)

	5/20.1988- 6/26.1988 (37days)	6/26.1988- 7/23.1988 (27days)	7/23.1988- 8/25.1988 (33days)	8/25.1988- 9/21.1988 (27days)	9/21.1988- 10/21.1988 (30days)
I -1	7	-2	-10	0	-5
2	-5	0	-3	-4	-7
3	-5	-3	-4	-3	-5
4	-1	-1	-2	-5	-4
5	2	-2	-5	-2	-4
6	-10	0	-5	-7	1
II -1	16	1	-1	-2	-5
2	-2	4	-5	-5	-5
3	-3	-1	-2	-4	-4
4	-1	0	-3	-3	-6
5	-1	-6	3	-5	-3
6	0	-2	-3	-4	-4
III -1	39	-2	-3	-5	-5
2	5	12	-4	-3	-2
3	-4	-2	-3	-3	-8
4	-7	-1	-3	-4	-8
5	13	-2	-1	-6	-3
6	0	-1	-3	-2	-5
IV -1	-1	9	-3	-4	-3
2	-1	-2	-3	-3	-8
3	-2	-1	-2	-2	-8
4	0	-2	-1	-4	-4
5	-2	-1	-1	-4	-7
6	8	-5	-4	-8	4
V -1	-6	-2	-1	-5	-2
2	-2	0	-2	-4	-7
3	-3	0	-5	-3	-4
4	-1	-2	-4	-3	-10
5	-2	0	-3	-3	-6
6	33	-3	-3	-4	-7
VI -1	-1	-1	-2	-4	-4
2	8	-2	1	-4	-8
3	9	-4	-3	-1	-8
4	-2	0	-3	-4	-5
5	-4	-4	-2	-4	-9
6	-5	4	-2	-5	-3
Mean	1.9	-0.7	-2.8	-3.8	-3.0

(cm in depth)

	10/21.1988- 11/20.1988 (30days)	11/20.1988- 12/21.1988 (31days)
I -1	-5	-10
2	-4	-3
3	-2	-5
4	-4	-4
5	1	-7
6	2	-1
II -1	-1	-2
2	1	-3
3	-2	-4
4	-2	-9
5	1	-4
6	0	-6
III -1	0	-5
2	0	-6
3	-2	4
4	-8	10
5	-2	-5
6	-5	-6
IV -1	0	-4
2	-12	-7
3	-4	-9
4	1	6
5	-4	-3
6	-1	-6
V -1	2	-7
2	-2	-6
3	-2	-11
4	-11	-6
5	-2	-4
6	-3	-7
VI -1	2	-5
2	-1	-4
3	0	-6
4	-3	-4
5	-5	-6
6	-7	-4
Mean	-2.3	-4.4

Table VI-2. Net accumulation with a 16-stake farm at Asuka Station in 1988.

(cm in depth)

	12/25.1987- 1/8.1988 (14days)	1/8.1988- 1/15 (7days)	1/15- 1/22 (7days)	1/22- 1/29 (7days)	1/29- 2/5 (7days)
I -1	4.5	-2.5	-2.5	-1.0	-1.0
-2	10.0	-3.5	-0.5	9.0	-3.0
-3	5.0	-2.5	0.0	-2.0	-5.5
-4	13.5	-3.0	-1.0	-1.5	-4.0
II -1	12.0	-0.5	10.5	-1.0	-4.0
-2	4.0	-2.5	5.0	-2.0	-6.0
-3	8.0	-2.5	-0.5	-1.0	-3.0
-4	20.5	-2.0	-1.5	-1.0	-2.5
III -1	-2.0	-1.5	9.0	7.0	-3.5
-2	0.0	-1.5	1.0	-1.0	-1.5
-3	-1.5	-1.0	0.5	-1.0	-1.0
-4	16.5	1.5	-1.5	-1.0	-3.0
IV -1	-7.0	-2.0	12.0	3.5	-3.5
-2	-1.0	-2.0	10.0	-8.0	-3.0
-3	-4.0	-0.5	6.0	-3.0	-4.0
-4	16.5	2.5	-1.5	-1.5	-1.5
Mean	5.9	-1.5	2.8	-0.3	-3.1

2/5- 2/12 (7days)	2/12- 2/22 (10days)	2/22- 2/26 (4days)	2/26- 3/4 (7days)	3/4- 3/12 (8days)	3/12- 3/20 (8days)	3/20- 3/25 (5days)
0.0	23.0	3	-8	14	50	-21
-3.0	52.0	-12	-1	-2	81	-43
-4.5	66.0	5	-33	-1	47	-13
-8.0	76.0	29	-9	-5	71	-33
-5.5	35.0	11	-16	-2	43	-27
0.0	36.0	8	-22	-19	79	-25
-4.0	56.0	-5	-5	-2	2	9
-4.0	67.5	-29	-27	-1	70	-25
-3.5	33.0	-6	-7	-2	42	-17
0.5	62.0	-8	-46	18	45	-10
0.0	48.5	-13	-25	-3	23	3
-6.5	55.5	-20	-18	0	44	-19
-10.0	45.5	-1	-11	-2	40	-6
-1.0	76.0	-27	-9	-1	16	11
-0.5	75.0	-15	-16	-1	7	1
-2.0	62.5	-36	-24	-2	38	-1
-3.3	54.3	-7.3	-17.3	-0.7	43.6	-13.5

(cm in depth)

	3/25- 4/1 (7days)	4/1- 4/10 (9days)	4/10- 4/15 (5days)	4/15- 4/23 (8days)	4/23- 4/29 (7days)	4/29- 5/11 (12days)
I -1	4	-6	0	-1	-1	0
-2	53	-68	0	0	0	0
-3	0	-11	-3	0	-1	-2
-4	-1	-2	0	0	-6	-2
II -1	8	0	0	0	-2	-2
-2	-8	-1	0	1	-1	-4
-3	-3	-5	-1	0	0	-1
-4	-6	-7	-5	1	-2	0
III -1	2	0	-1	0	0	0
-2	5	-1	-1	0	0	-1
-3	-2	-2	0	0	-1	-2
-4	-10	5	-1	4	-4	0
IV -1	-1	-2	0	0	-6	-1
-2	-1	-1	-1	1	-2	-1
-3	-2	-1	0	0	0	-1
-4	-9	0	-2	0	1	-3
Mean	1.8	-6.4	-0.9	0.4	-1.6	-1.3

5/11- 5/13 (2days)	5/13- 5/20 (7days)	5/20- 6/1 (12days)	6/1- 6/7 (6days)	6/7- 6/12 (5days)	6/12- 6/23 (11days)	6/23- 7/1 (8days)
0	4	5	1	-1	7	-3
0	20	19	-18	0	14	-1
0	20	-2	-2	-1	18	-10
0	21	-1	-14	-1	7	-8
1	15	9	3	-30	39	-12
7	20	stake loss	-7	-7	28	-11
-3	32	-2	0	-5	37	-26
-1	21	12	10	-24	2	2
0	12	11	4	-18	20	-6
0	10	-2	2	-1	34	-11
-1	31	6	-8	-3	21	-1
-1	18	14	5	-14	16	-17
1	17	13	-8	-6	14	-14
0	16	22	-11	0	26	-15
0	30	0	-4	-1	24	-21
0	27	5	5	-21	42	-16
0.2	19.6	7.3	-2.6	-8.3	21.8	-10.6

(cm in depth)

	7/1-7/8 (7days)	7/8-7/15 (7days)	7/15-7/23 (8days)	7/23-7/29 (6days)	7/29-8/10 (12days)	8/10-8/14 (4days)
I -1	1	-1	-3	-3	-1	0
-2	4	0	0	-2	-1	0
-3	1	-1	2	-1	-2	0
-4	-1	-1	22	-2	-2	1
II -1	-1	0	-1	0	-1	-1
-2	-2	-1	-1	0	0	2
-3	-4	-1	-3	-1	-1	0
-4	8	5	-6	0	0	-1
III -1	0	0	-1	-2	-12	0
-2	-4	-1	0	-1	-1	-1
-3	-1	-1	-7	-2	-6	4
-4	4	0	0	-1	0	-1
IV -1	-1	-1	0	-2	0	-2
-2	-4	0	-7	-1	-1	-1
-3	-5	0	0	1	-1	-1
-4	0	0	-1	0	0	-1
Mean	-0.3	-0.2	-0.4	-1.1	-1.8	-0.1

8/14-8/19 (5days)	8/19-8/26 (7days)	8/26-9/3 (8days)	9/3-9/9 (6days)	9/9-9/17 (8days)	9/17-9/21 (4days)	9/21-9/29 (8days)
0	-1	0	-2	0	3	-7
-1	0	-1	-2	-1	-4	-2
-5	0	-2	0	0	-2	-2
-2	-1	0	-3	-1	-2	-2
0	-2	-2	0	0	-2	-8
-5	0	-1	0	0	-2	5
-1	0	0	-1	0	-2	-1
0	0	-1	-3	3	-5	-1
-2	0	-1	-1	1	-2	-3
-1	-1	-1	-2	1	-2	-3
-3	-1	-1	0	-1	-3	-3
0	3	-1	-1	0	-2	0
-1	0	-1	0	-1	-1	-1
0	-1	-2	-1	1	-3	-2
-2	2	-2	-1	0	-2	-1
-1	0	0	-1	-3	-2	-2
-1.5	-0.1	-1.0	-1.1	-0.1	-2.1	-2.1

(cm in depth)

	9/29-10/7 (9days)	10/7-10/14 (7days)	10/14-10/21 (7days)	10/21-10/28 (7days)	10/28-11/4 (7days)	11/4-11/11 (7days)	11/11-11/18 (7days)	11/18-11/25 (7days)	11/25-12/2 (7days)	12/2-12/9 (7days)	12/9-12/16 (7days)
I -1	0	-2	1	0	-1	-3	-1	-1	1	-1	-1
-2	0	-1	-1	-1	-1	-1	-1	-1	-1	-1	-3
-3	-1	0	-8	0	-3	-1	-2	-1	3	0	7
-4	0	-1	-4	-1	0	-2	-3	-2	-1	-2	-1
II -1	-1	-9	1	-2	-1	-4	-3	-2	-1	-2	0
-2	-6	5	-2	-1	0	-2	-1	0	-1	-4	1
-3	-1	-2	-1	-3	-1	-1	-2	-1	-1	-2	3
-4	-1	-1	0	-1	-1	0	0	-1	-2	-1	0
III -1	0	-2	0	-1	0	-1	0	0	-3	-1	1
-2	0	-1	-4	-1	0	-1	-3	-1	-1	-2	0
-3	-1	-2	-2	-1	-1	-1	-1	0	-5	-1	-2
-4	0	-1	-1	-1	0	-2	0	0	-2	0	17
IV -1	0	-1	-2	-1	0	-1	-2	-1	-1	-2	-2
-2	-1	-1	-1	-1	0	-5	-2	0	-1	-1	6
-3	-1	-1	-4	-1	-1	-2	-1	-1	-1	-2	5
-4	0	0	-3	1	-2	-1	-3	-1	-1	-2	-1
Mean	-0.8	-1.3	-1.9	-0.9	-0.8	-1.8	-1.6	-0.8	-1.1	-1.5	1.9

VII. Surface Slopes along the Routes in Mizuho Plateau

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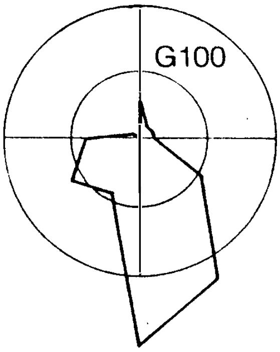
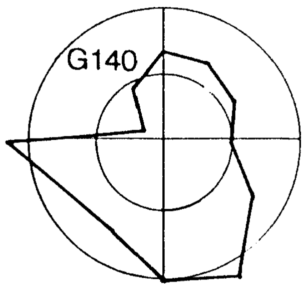
The surface slopes of the ice sheet were measured during inland traverses along new routes from G6 to A-point, from A-point to B-point, Routes E and NY at 10 km intervals in 1988. By means of a Wild-T2 theodolite, vertical angles of the surface against the theodolite horizontal plane was read for direction at 30° intervals. The readings of measurement and the patterns of distribution of declination are given in Fig. 1, where dashed lines in the patterns of distribution represent the estimated lines in case of visibility not permitted. The zero degree of reading suggests there is no data of that direction. Outer circle and inner circle show 10 min and 20 min of declination, respectively.

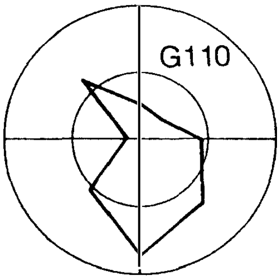
Direction	Declination
0°	-0° 06′
30	-0 02
60	+0 02
90	+0 02
120	+0 10
150	+0 24
180	+0 25
210	+0 09
240	+0 12
270	-0 08
300	+0 01
330	0 00



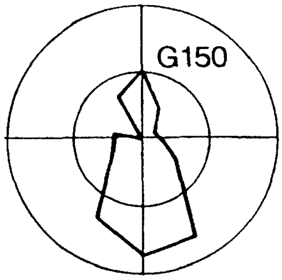
Direction	Declination
0°	-0° 13′
30	-0 13
60	-0 12
90	+0 10
120	+0 15
150	+0 22
180	+0 20
210	+0 15
240	-
270	-0 23
300	-0 03
330	-0 09



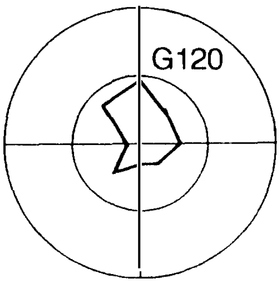
Direction	Declination
0°	-0° 05′
45	+0 04
90	+0 09
135	+0 13
180	+0 17
225	+0 11
270	-0 02
315	-0 12



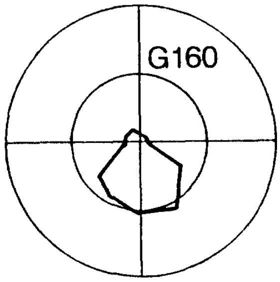
Direction	Declination
0°	-0° 10′
30	-0 05
60	-0 02
90	-0 03
120	+0 06
150	+0 16
180	+0 17
210	+0 14
240	+0 05
280	+0 04
300	0 00
330	-0 07



Direction	Declination
0°	-0° 09′
45	-0 06
90	-0 06
135	+0 02
180	+0 03
225	+0 06
270	-0 02
315	-0 08



Direction	Declination
0°	-0° 01′
30	+0 01
60	+0 01
90	+0 01
120	+0 07
150	+0 11
180	+0 10
210	+0 09
230	+0 08
270	-0 02
300	-0 02
330	-0 01



Direction	Declination
0°	+0° 05′
45	-0 04
90	+0 01
135	+0 07
180	+0 08
225	+0 04
270	+0 03
315	+0 08

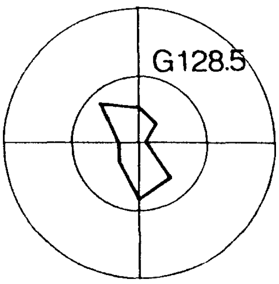
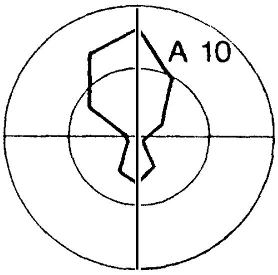
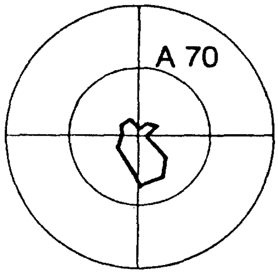


Fig. 1. Distribution pattern of surface slope in Mizuho Plateau.

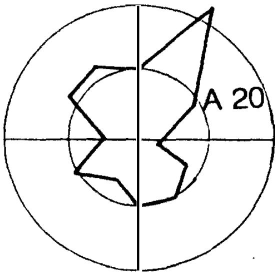
Direction	Declination
0°	-0° 10′
30	-0 22
60	-0 09
104	+0 03
120	+0 08
150	+0 10
180	+0 10
210	+0 07
240	+0 11
270	-0 05
300	-0 12
330	-0 12



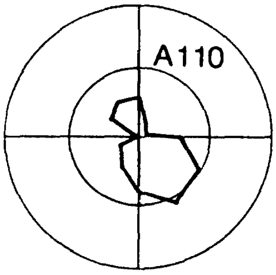
Direction	Declination
0°	-0° 01′
30	-0 02
60	-0 03
90	+0 01
130	+0 05
150	+0 07
180	+0 07
210	+0 04
240	+0 04
270	+0 03
300	+0 03
330	+0 01



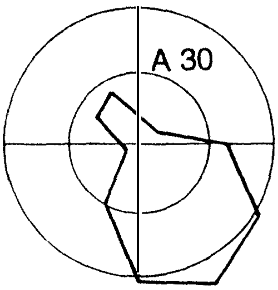
Direction	Declination
0°	-0° 16′
30	-0 10
60	-0 04
100	-0 01
120	+0 01
150	+0 05
180	+0 07
210	+0 06
240	+0 02
270	-0 02
300	-0 08
330	-0 14



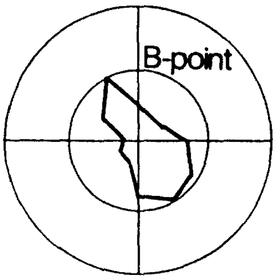
Direction	Declination
0°	-0° 06′
30	-0 02
60	+0 01
90	+0 06
120	+0 10
150	+0 11
180	+0 08
210	+0 05
240	+0 03
270	0 00
300	-0 05
330	-0 06



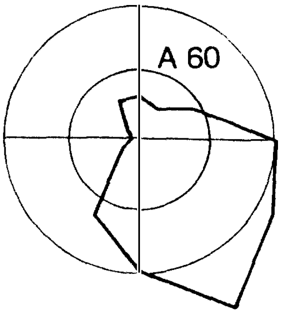
Direction	Declination
0°	-0° 04′
30	-0 03
60	+0 03
90	+0 13
120	+0 21
150	+0 23
180	+0 20
210	+0 10
240	+0 02
270	-0 03
300	-0 07
330	-0 08



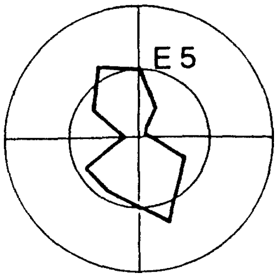
Direction	Declination
0°	-0° 05′
30	0 00
60	+0 04
90	+0 07
120	+0 09
150	+0 10
180	+0 08
210	+0 03
240	+0 03
270	-0 02
300	-0 06
330	-0 10



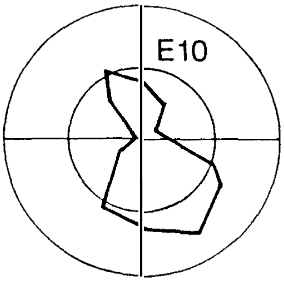
Direction	Declination
0°	-0° 06′
30	-0 05
60	+0 09
90	+0 20
120	+0 22
150	+0 28
180	+0 19
210	+0 13
240	-0 03
270	-0 01
300	-0 02
330	-0 06



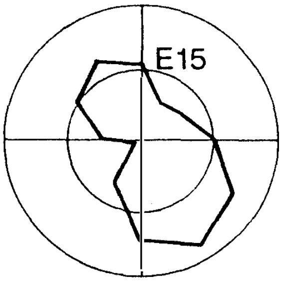
Direction	Declination
0°	-0° 10′
30	-0 05
60	-0 01
90	0 00
120	+0 07
160	+0 13
180	+0 10
210	+0 09
240	+0 09
270	+0 02
300	-0 08
330	-0 12



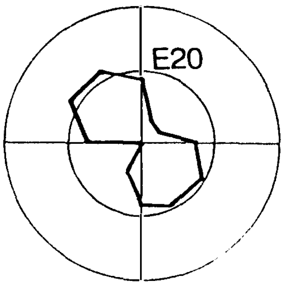
Direction	Declination
0°	-0° 08′
30	-0 06
60	-0 02
110	+0 11
120	+0 13
150	+0 16
180	+0 13
210	+0 12
240	+0 04
270	-0 01
300	-0 07
330	-0 11



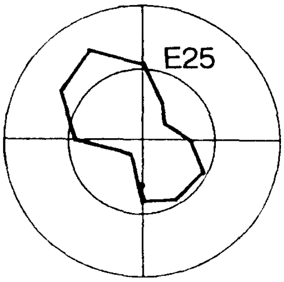
Direction	Declination
0°	-0° 11′
30	-0 06
60	+0 07
90	+0 11
120	+0 16
150	+0 18
180	+0 15
210	+0 08
240	-0 01
270	-0 06
300	-0 11
330	-0 13



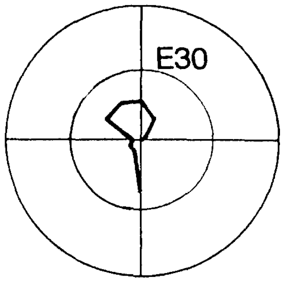
Direction	Declination
0°	-0° 09′
30	-0 03
60	+0 03
90	+0 08
120	+0 10
155	+0 10
180	+0 09
210	+0 05
240	0 00
270	-0 08
300	-0 12
330	-0 12



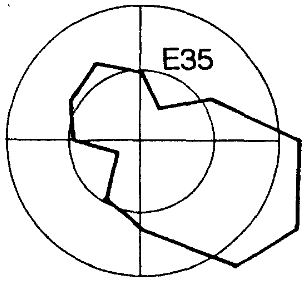
Direction	Declination
0°	-0° 11′
30	-0 06
60	+0 04
90	+0 07
117	+0 10
150	+0 10
180	+0 09
210	+0 03
240	-0 04
270	-0 10
300	-0 14
330	-0 15



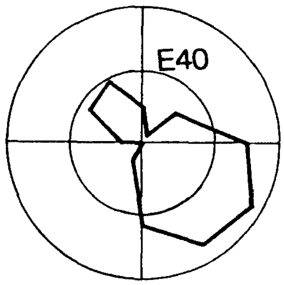
Direction	Declination
0°	-0° 06′
30	-0 04
50	-0 01
95	0 00
120	+0 10 ?
150	+0 05 ?
180	+0 08
210	+0 02
240	+0 02
270	+0 01
300	-0 06
330	-0 06



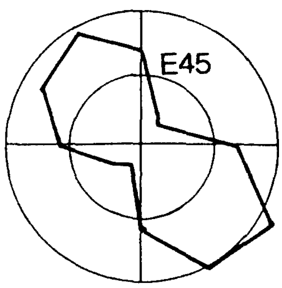
Direction	Declination
0°	-0° 10′
30	-0 05
60	+0 12
90	+0 23
120	+0 26
143	+0 23
180	+0 13
210	+0 10
240	-0 04
270	-0 10
300	-0 12
330	-0 13



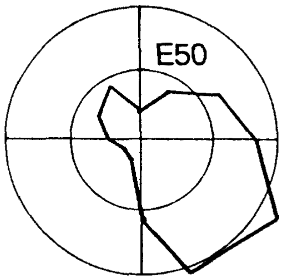
Direction	Declination
0°	-0° 05′
30	+0 01
48	+0 06
90	+0 15
120	+0 18
150	+0 17
180	+0 12
210	+0 03
240	0 00
270	-0 03
300	-0 09
330	-0 10



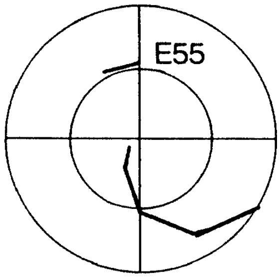
Direction	Declination
0°	-0° 14′
30	-0 05
40	-0 04
90	+0 14
120	+0 22
150	+0 20
180	+0 12
210	+0 03
240	-0 05
270	-0 12
300	-0 17
330	-0 19



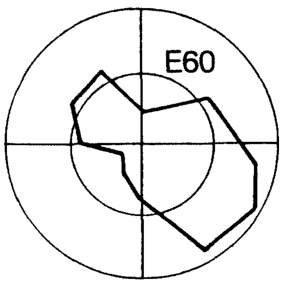
Direction	Declination
0 °	-0 ° 04 ′
30	+0 08
60	+0 13
90	+0 17
120	+0 23
160	+0 21
180	+0 12
210	+0 03
240	-0 03
270	-0 05
300	-0 07
330	-0 09



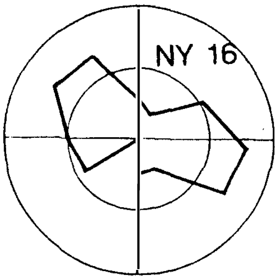
Direction	Declination	
0 °	-0 ° 11 ′	
30	+0 05	?
54	+0 12	?
90	-	
120	+0 20	
150	+0 16	
180	+0 11	
210	+0 05	
240	-0 02	
270	-	
300	-0 27	
330	-0 21	



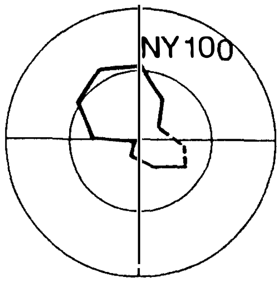
Direction	Declination
0 °	-0 ° 05 ′
30	+0 06
55	+0 12
100	+0 17
120	+0 19
150	+0 18
180	+0 08
210	+0 05
240	-0 03
270	-0 09
300	-0 12
330	-0 12



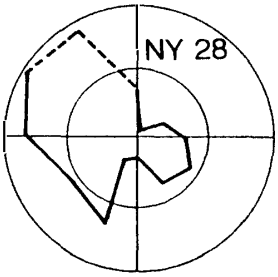
Direction	Declination	
0 °	-0 ° 06 ′	
25	-0 04	
60	+0 11	
95	+0 16	
120	+0 15	
150	+0 05	
180	+0 05	
210	0 00	
240	-0 09	
270	-0 11	
300	-0 15	
330	-0 14	



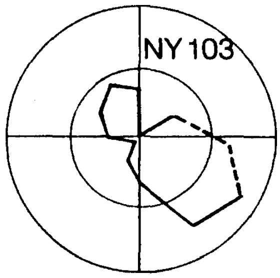
Direction	Declination	
0 °	-0 ° 11 ′	
30	-0 07	
60	-0 03	
95	+0 07	?
120	+0 08	
150	+0 05	
180	+0 03	
210	+0 03	
240	-0 01	
270	-0 07	
300	-0 11	
330	-0 12	



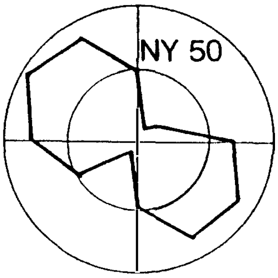
Direction	Declination	
0 °	-0 ° 07 ′	
20	-0 01	
60	+0 04	
90	+0 07	
120	+0 09	
150	+0 08	
180	+0 03	
210	-0 04	
240	-0 12	
270	-0 17	
300	-0 19	
330	-0 18	?



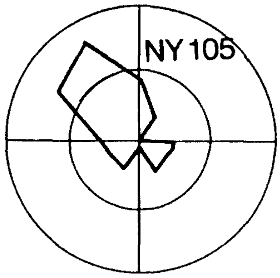
Direction	Declination	
0 °	-0 ° 07 ′	
30	0 00	
55	+0 06	
95	+0 13	?
120	+0 17	
150	+0 15	
180	+0 07	
210	+0 04	
240	-0 01	
270	-0 05	
300	-0 07	
330	-0 09	



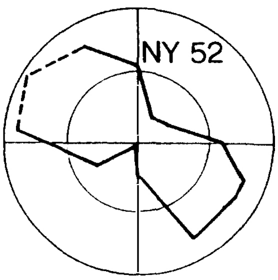
Direction	Declination
0 °	-0 ° 10 ′
30	-0 02
55	+0 04
90	+0 14
120	+0 17
150	+0 16
180	+0 10
210	+0 02
240	-0 10
270	-0 16
300	-0 19
330	-0 17



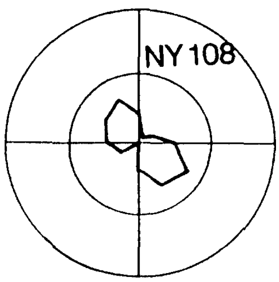
Direction	Declination
0 °	-0 ° 09 ′
30	-0 04
55	0 00
90	+0 05
115	+0 05
150	+0 05
180	+0 01
210	-0 05
240	-0 05
270	-0 06
300	-0 14
330	-0 16



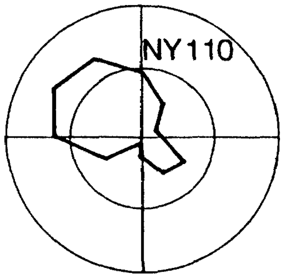
Direction	Declination	
0 °	-0 ° 11 ′	
30	-0 03	
60	+0 05	
90	+0 12	
110	+0 16	
120	+0 16	
130	+0 16	
150	+0 16	
180	+0 05	
210	-0 01	
240	-0 07	
275	-0 18	?
300	-0 19	
330	-0 16	



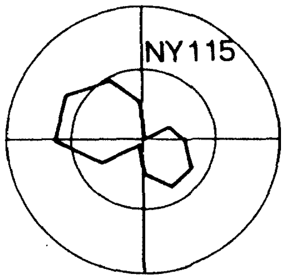
Direction	Declination
0 °	-0 ° 04 ′
30	-0 01
60	+0 02
90	+0 05
120	+0 08
150	+0 07
180	+0 04
210	0 00
240	-0 03
270	-0 05
300	-0 06
330	-0 07



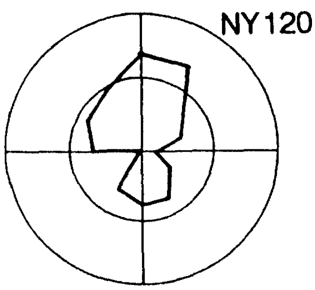
Direction	Declination
0 °	-0 ° 10 ′
30	-0 06
60	-0 02
90	+0 03
120	+0 07
150	+0 06
180	+0 03
210	-0 01
240	-0 06
270	-0 13
300	-0 15
330	-0 14



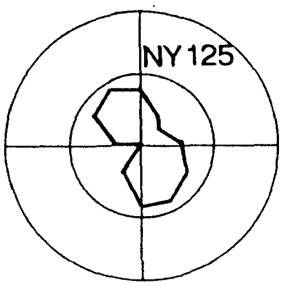
Direction	Declination
0 °	-0 ° 05 ′
30	0 00
65	+0 04
90	+0 06
120	+0 08
150	+0 08
180	+0 05
210	-0 01
240	-0 07
270	-0 13
300	-0 13
330	-0 10



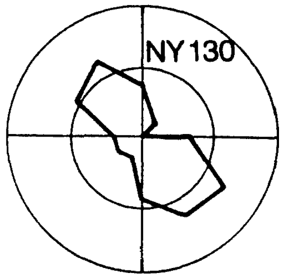
Direction	Declination
0 °	-0 ° 14 ′
30	-0 14
70	-0 06
95	+0 02
120	+0 05
150	+0 08
180	+0 08
210	+0 07
240	0 00
270	-0 07
300	-0 09
330	-0 10



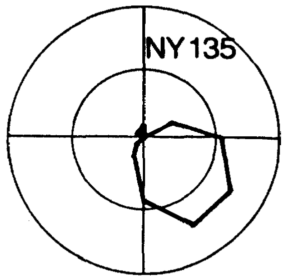
Direction	Declination
0 °	-0 ° 08 ′
30	-0 05
45	-0 03
85	+0 06
120	+0 08
150	+0 09
180	+0 09
210	+0 05
240	0 00
270	-0 04
300	-0 08
330	-0 09



Direction	Declination
0 °	-0 ° 08 ′
40	-0 03
60	0 00
90	+0 07
120	+0 14
150	+0 13
180	+0 09
210	+0 03
240	+0 04
270	-0 04
300	-0 11
330	-0 13



Direction	Declination
0 °	-0 ° 02 ′
30	0 00
60	+0 05
90	+0 12
120	+0 15
125	+0 15
130	+0 15
135	+0 15
140	+0 15
145	+0 15
150	+0 15
180	+0 09
210	+0 03
235	+0 01
270	0 00
300	0 00
330	-0 01



VIII. Rammzonde Hardness of the Surface Snow Cover in Mizuho Plateau

Observers: Teruo FURUKAWA, Tetsuro UEKUBO, Shuji AOKI and Haruo MIKAMI

Surface hardness of snow was measured with the Rammzonde every 10 km along new routes in November and December 1988. Rammzonde hardness number is computed by the following expression (Ueda *et al.*,1975):

$$R = m+M+mhN/d$$

where m : weight of hammer (kg)

M : weight of penetrometer (kg)

h : height of drop (cm)

N : number of hammer blows

d : total amount of penetration after N blows (cm).

Vertical profile of Rammzonde hardness with about 5 cm grades to a depth 1-2 m is shown in Fig. 2.

Reference

Ueda, H., Sellmann, P. and Abele, G. (1975): USA CRREL Snow and Ice Testing Equipment. CRREL Spec. Rep., 146, 14p.

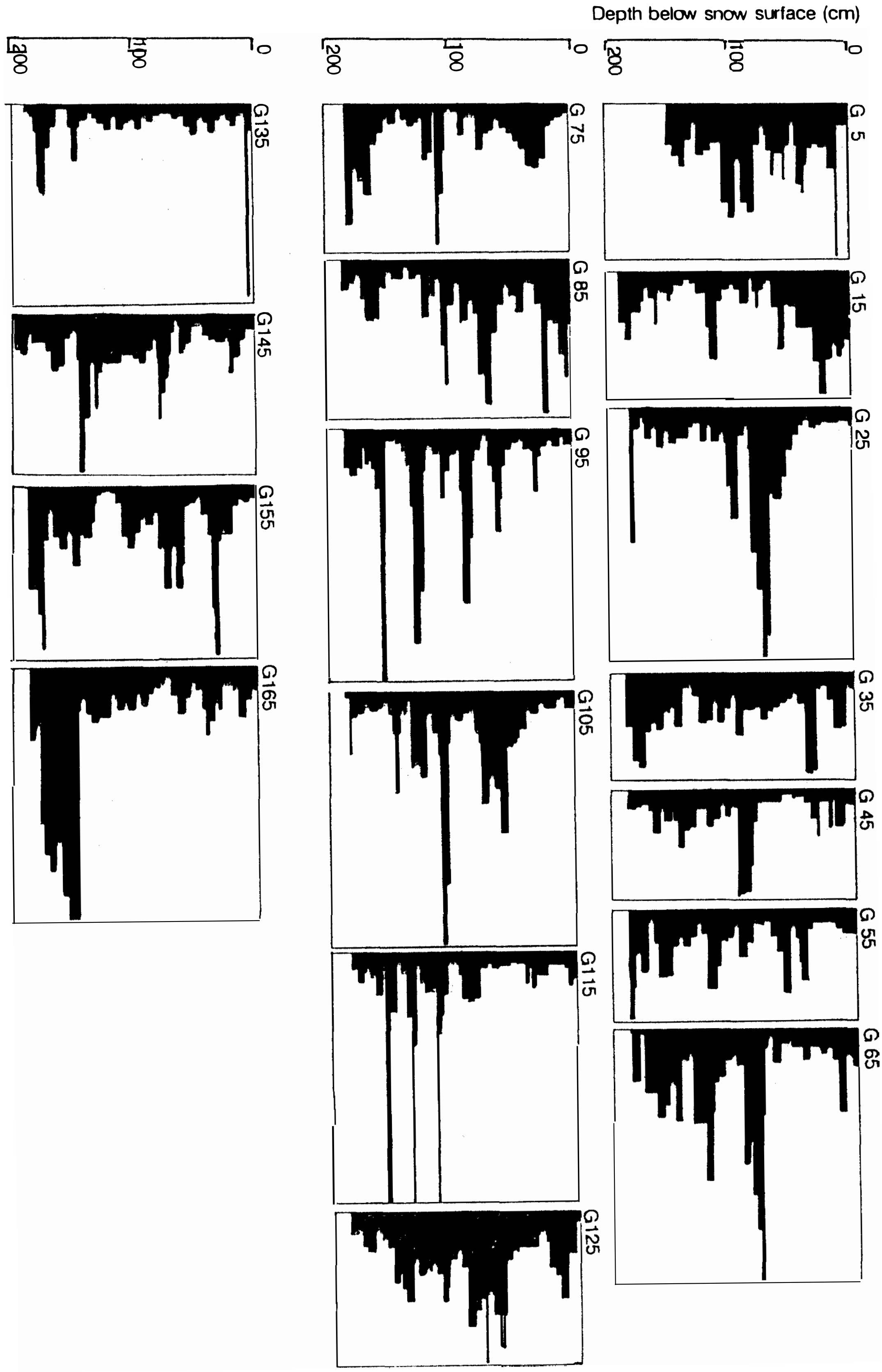
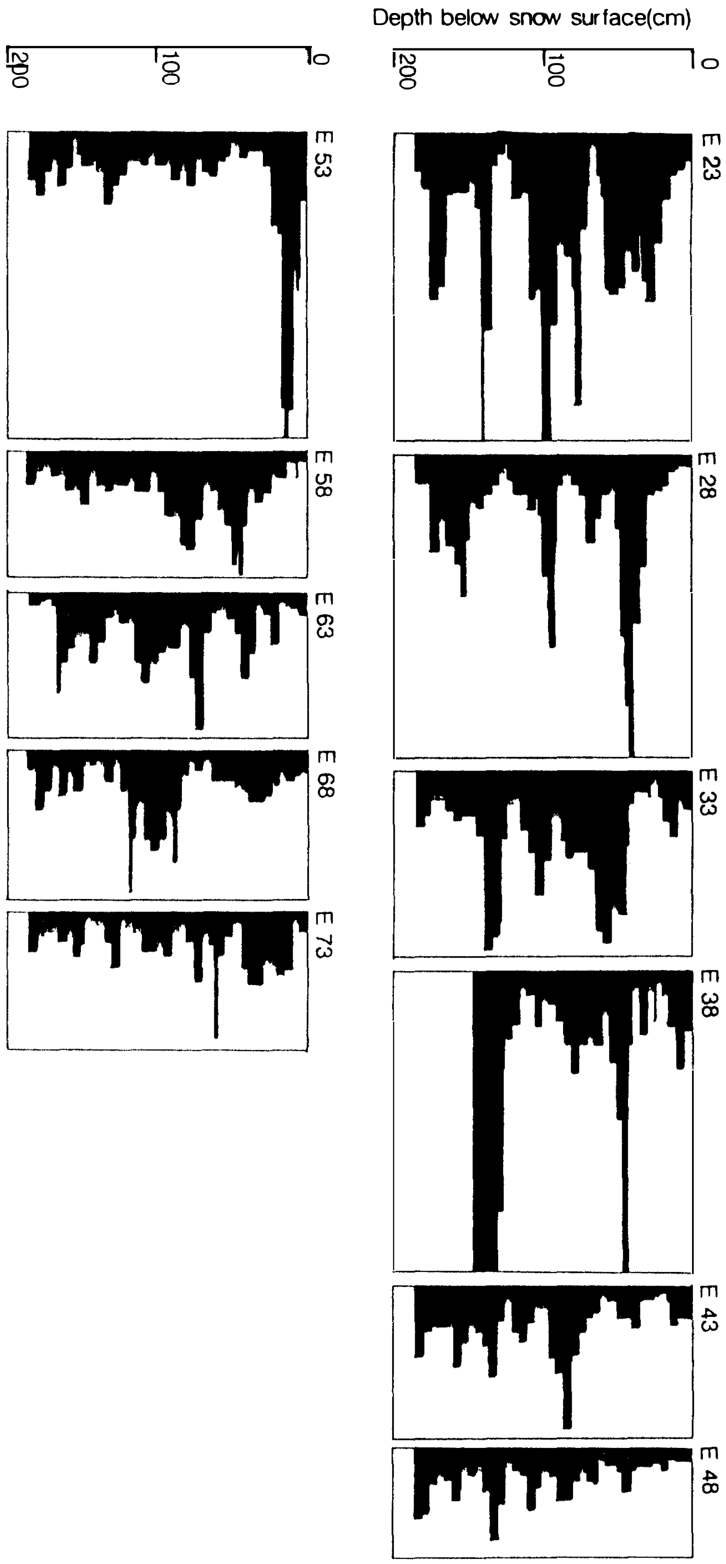
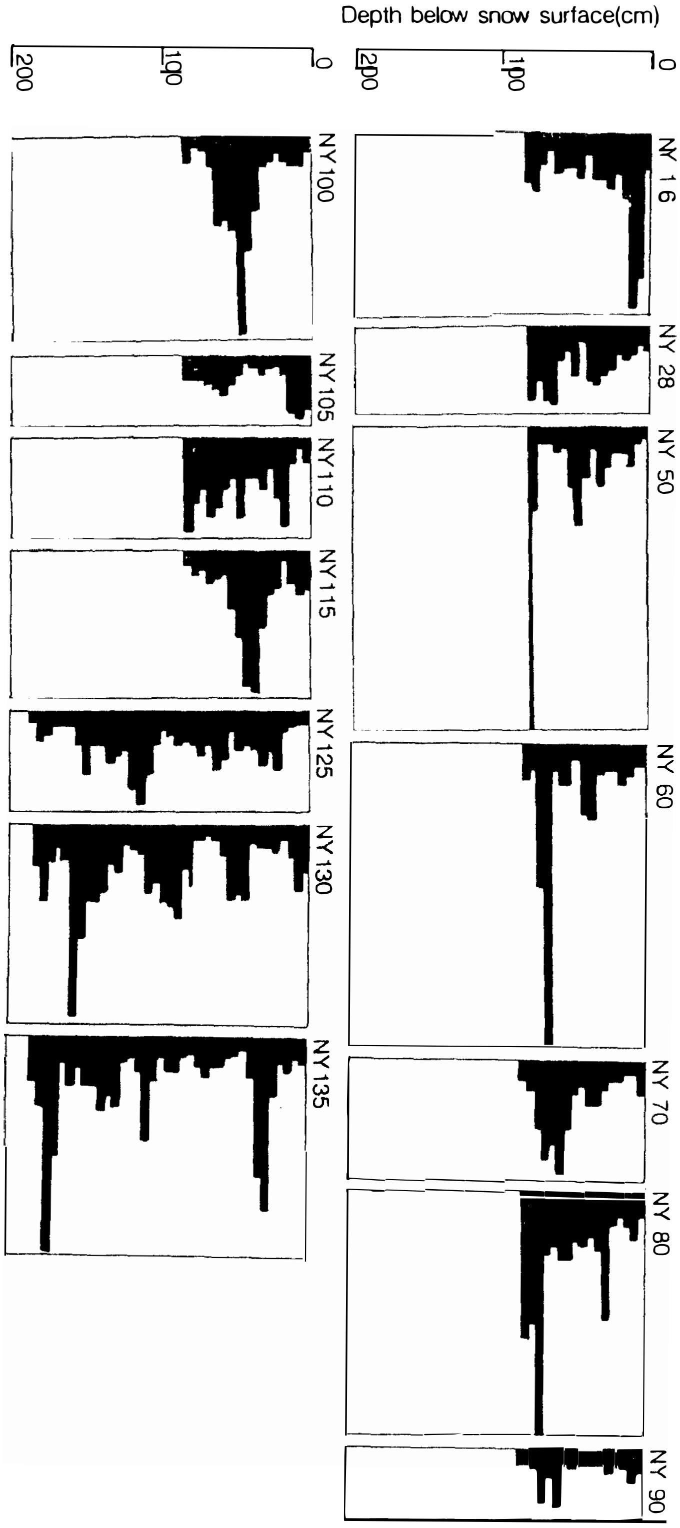


Fig. 2. Rammzonde hardness profiles along the routes in Mizuho Plateau.


Depth below snow surface(cm)
0
100
200
A 5
A 15
A 25
A 35
A 45
A 55
A 65
A 75
A 85
A 95
A105
A115
B-point
E 3
E 8
E13
E18


Depth below snow surface(cm)
0
100
200
E 23
E 28
E 33
E 38
E 43
E 48
E 53
E 58
E 63
E 68
E 73


Depth below snow surface(cm)
0
100
200
NY 16
NY 28
NY 50
NY 60
NY 70
NY 80
NY 90
NY100
NY105
NY110
NY115
NY125
NY130
NY135

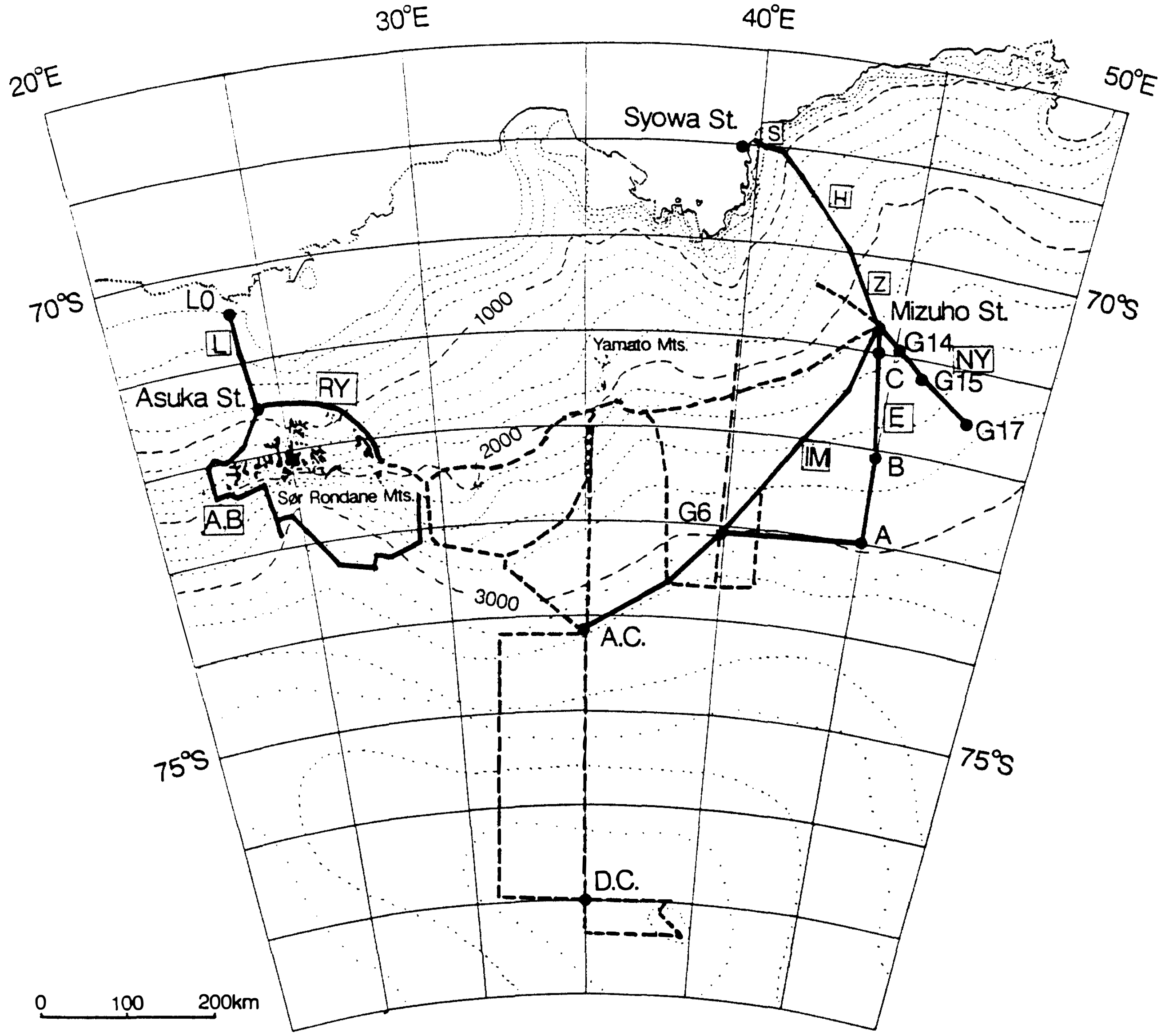


Fig. A. Route map of the oversnow traverses in East Queen Maud Land, Antarctica. Solid line indicates the routes of JARE-29 in 1988-1989. A.C.: Advance Camp, D.C.: Dome Camp.