

## II. GLACIOLOGICAL OBSERVATION IN MIZUHO PLATEAU-WEST ENDERBY LAND AREA, EAST ANTARCTICA, 1974 - 1975

### 1. Density and Hardness of the Surface Snow Cover along the Traverse Routes in 1974 - 1975

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Measurements of snow density at the surface were carried out along the oversnow traverse routes in 1974 - 1975. The results are given in Table 1.

Surface hardness of snow was measured with a Kinosita's hardness gauge. The gauge hammered into the Antarctic snow penetrated very little so that the definition of Kinosita's hardness was unapplicable. Hence, a new measure (R) of hardness similar to the Ram sonde hardness number is defined by the following equation:

$$R = \frac{1}{S} \left\{ (m + m') + \frac{m \times h \times N}{d} \right\} \quad (\text{kg/cm}^2)$$

where S : area of cross section at the top of penetrometer (4.9 cm<sup>2</sup>)

m : weight of hammer (1.0 kg)

m' : weight of penetrometer (0.73 kg)

h : height of drop (cm)

N : number of hammer blows

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

Results of measurements of (R) are given in Tables 2 and 3. When there were apparently different snow surfaces at a station, measurement was made on each surface.

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Table 1. Snow density (g/cm<sup>3</sup>) at the surface.

Station	Density	Date
H 35	0.34	Oct. 5 (1974)
H 88	0.41	" 6
H 228	0.44	" 8
S 122	0.39	" 8
Z 40	0.39	" 9
Z 84	0.42	" 10
Y' 20	0.45	" 14
Y' 30	0.34	" "
Y' 60	0.38	" 15
Y' 90	0.37	" 16
Y' 130	0.40	" 22
Y' 170	0.40	" 23
I 120	0.38	" 30
I 260	0.37	Nov. 3
I 320	0.36	" 5
I 400	0.40	" 7
I 485	0.36	" 9
I 530	0.26	" 10
I 600	0.36	" 12
J 60	0.31	" 18
J 140	0.41	" 19
J 180	0.35	" 20
J 220	0.40	" 21
J 260	0.38	" 23
J 320	0.43	" 25
Mizuho Camp	0.41	Dec. 15
S 40	0.32	Feb. 9 (1975)
S 50	0.31	" "
S 60	0.34	" "
S 70	0.39	" "
S 79	0.36	" 8
S 90	0.39	" "
S 100	0.43	" "
S 110	0.35	" 7,
Z 11.5	0.44	" "
Z 31	0.46	" 6
Z 66	0.41	" "
Z 85	0.42	" "

Table 2. Surface hardness along Route S - H - Z in March 1974.

Station	Day	R (kg/cm <sup>2</sup> )
S 25-4	8	0.9, 4.6
S 26-4	"	5.0
S 27	"	4.2
S 27-4	"	4.9
S 28	"	5.6
S 28-4	"	2.4
S 29	"	2.7
S 29-3	"	2.7
S 30	"	2.4
H 3	"	3.5
H 12	"	3.8
H 21	"	27.9
H 30	"	4.1
H 45	"	1.7
H 60	"	4.4
H 70	"	4.2
H 80	"	12.1
H 100	9	4.7
H 120	"	1.0
H 140	"	5.3
H 160	10	2.6
H 180	"	2.0
H 200	"	2.4
H 220	"	8.8
H 240	"	2.4
H 260	11	10.4, 18.5
H 280	"	4.9
S 122	"	1.0, 6.7
Z 10	"	1.7, 5.3
Z 20	"	8.3
Z 40	12	5.7
Z 70	"	9.1
Z 80	"	38.9
Z 90	"	1.1, 4.5
Z 100	"	5.4

Table 3. Surface hardness along Routes S, H, Z, Y', I and J  
in October/November 1974.

Station	Date	R (kg/cm <sup>2</sup> )	Station	Date	R (kg/cm <sup>2</sup> )
S 16	Oct. 4	8.0	Y' 50	Oct. 15	5.8, 7.8
S 19	"	34.3	Y' 55	"	8.2, 44.1
S 21	"	3.3	Y' 60	"	8.5, 25.4
S 25	"	4.3	Y' 65	"	6.4, 33.1
S 30	Oct. 5	3.1, 6.2	Y' 70	Oct. 16	8.7, 18.5
H 35	"	3.0	Y' 75	"	41.1, 46.9
H 68	"	4.1, 12.9	Y' 80	"	7.1, 7.8
H 88	Oct. 6	3.4	Y' 90	"	5.6, 35.3
H 128	"	32.9	Y' 95	"	6.0, 22.2
H 148	Oct. 7	5.4	Y' 100	Oct. 17	5.0, 18.5
H 168	"	4.8, 41.1	Y' 105	Oct. 22	6.2, 16.2
H 188	"	4.2, 7.7	Y' 110	"	5.6, 35.3
H 208	"	4.8, 5.6	Y' 115	"	5.3, 8.6
H 228	"	4.1, 15.3	Y' 120	"	6.0, 11.2
H 248	Oct. 8	3.0	Y' 125	"	7.8, 12.1
H 268	"	5.8, 8.5	Y' 130	"	24.8
H 288	"	8.5	Y' 135	"	6.2, 37.4
S 122	"	13.0	Y' 140	"	5.5, 14.6
Z 10.5	Oct. 9	23.6	Y' 145	Oct. 23	9.4, 20.7
Z 20	"	9.9	Y' 150	"	6.0, 14.6
Z 30	"	6.2	Y' 155	"	4.9, 10.9
Z 40	"	4.5	Y' 160	"	4.1, 34.8
Z 58	Oct. 10	35.3	Y' 165	"	15.2, 16.1
Z 74	"	55.4	Y' 170	"	15.2, 23.7
Z 84	"	35.3	Y' 175	"	13.3, 16.6
Z 94	"	10.6	Y' 180	Oct. 24	7.5, 11.3
Y' 5	Oct. 14	9.0, 17.2	Y' 185	"	4.3, 8.3
Y' 10	"	6.6, 10.1	Y' 190	"	10.6, 28.8
Y' 15	"	8.5, 11.6	Y' 195	"	10.2, 16.6
Y' 20	"	4.8, 6.4	Y' 200	"	5.1, 12.9
Y' 25	"	5.0, 41.1	Y' 205	"	16.6, 45.6
Y' 30	"	6.2, 54.7	Y' 210	"	6.5, 16.6
Y' 35	Oct. 15	6.2, 51.3	I 10	Oct. 27	22.9, 27.5
Y' 40	"	5.2, 10.9	I 20	"	17.6, 17.6
Y' 45	"	4.5, 13.9	I 30	"	13.9, 30.2

Station	Date	R (kg/cm <sup>2</sup> )	Station	Date	R (kg/cm <sup>2</sup> )
I 40	Oct.28	10.5, 13.0	I 400	Nov. 7	1.8, 16.7
I 50	"	9.7, 10.6	I 410	"	3.3, 5.1
I 60	"	11.8, 24.1	I 420	"	3.6, 6.9
I 70	"	12.5, 17.8	I 430	"	3.9, 7.1
I 80	Oct.29	18.5, 19.6	I 440	Nov. 8	1.7, 7.8
I 90	"	8.1, 15.2	I 450	"	3.6, 5.6
I 100	"	6.9, 8.6	I 460	"	2.1, 23.2
I 110	"	8.7, 9.7	I 480	"	1.9, 28.3
I 120	Oct.30	5.3, 7.8	I 500	Nov.10	1.6, 7.8
I 130	"	15.3, 15.6	I 515	"	1.5, 2.2
I 140	"	7.8, 9.4	I 530	"	1.3, 7.4
I 150	"	8.1, 11.2	I 555	Nov.11	2.3, 8.2
I 160	Oct.31	5.1, 11.3	I 570	"	3.4, 4.1
I 170	"	9.5, 10.0	I 585	Nov.13	3.2, 6.6
I 180	"	9.7, 9.7	I 600	"	2.8, 9.2
I 190	"	7.8, 12.6	J 10	Nov.17	2.1, 2.9
I 200	Nov. 1	4.1, 5.0	J 20	"	2.1, 4.4
I 210	"	7.3, 21.7	J 30	"	1.3, 3.6
I 220	"	3.6, 9.0	J 40	"	3.3, 20.7
I 230	"	2.7, 5.8	J 50	Nov.18	1.4, 2.4
		6.7	J 60	"	2.1, 3.4
I 240	Nov. 3	2.9, 10.6	J 70	"	1.9, 2.5
I 250	"	2.1, 3.1	J 80	"	3.2, 7.8
I 260	"	2.3, 4.1	J 90	"	3.5, 5.8
I 270	"	3.1, 6.6	J 100	Nov.19	1.2, 6.0
I 280	Nov. 4	2.6, 3.0	J 110	"	1.8, 6.6
I 290	"	2.1, 4.1	J 120	"	2.6, 9.7
I 300	"	3.2, 4.9	J 130	"	3.1, 7.5
I 310	"	2.1, 5.9	J 140	"	5.2, 10.0
I 320	Nov. 5	2.4, 4.5	J 150	Nov.20	2.7, 4.7
I 330	"	2.6, 7.8	J 160	"	5.8, 10.9
I 340	"	3.4, 3.4	J 170	"	3.0, 5.0
I 350	"	4.6, 5.1	J 180	"	5.8, 9.7
I 360	Nov. 6	3.4, 5.9	J 190	Nov.21	2.3, 4.4
I 370	"	1.9, 3.4	J 200	"	3.3, 15.9
I 380	"	1.6, 3.4	J 210	"	4.3, 6.9

Station	Date	R (kg/cm <sup>2</sup> )
J 220	Nov.21	7.8, 11.3
J 230	Nov.23	2.2, 9.0
J 240	"	2.7, 4.4
J 250	"	5.3, 10.5
J 260	"	3.1, 6.4
J 270	"	3.4, 22.2
J 280	Nov.24	5.8, 10.0
J 290	"	6.3, 16.8
J 310	"	5.0, 19.6
J 320	Nov.25	5.4, 5.8
J 330	"	2.5, 4.0
J 340	"	3.7, 9.4
J 350	"	2.1, 5.6
		7.4
J 360	"	10.3, 35.3
J 364	Nov.26	2.8, 10.5
J 370	Nov.27	8.0, 8.0
J 380	"	11.6, 37.2
J 390	"	6.6, 29.8
J 400	"	2.5, 143.0
J 408	"	7.6, 46.9
J 420	Nov.28	13.9, 16.6
J 430	"	4.7, 19.6
J 440	"	4.5, 9.7
J 450	"	16.7, 22.2
J 460	"	12.0, 13.9
J 470	Nov.29	9.0, 11.6
J 480	"	3.7, 30.9