2.3 Discussion of Results

The results of the measurements conducted on the soil temperatures at the bottom of 60 cm. and one (1) meter depths, the mercury concentration in soil, and radon gas concentration in soil-air are shown in Table III–2–3. Table III–2–2 shows the O/H isotope data of the fifteen samples of present studies, together with the results of four water samples collected last year from the hot springs at Acupan mine tunnel and Itogon bridge.

2.3.1 Ground Geochemical Survey

(a) Soil Temperature Distribution: The result of monitoring the daily variations in the bottom temperature at the base point showed that the difference between the maximum and the minimum value of the temperatures measured had been as small as 0.3°C. Hence, no daily correction was made on the soil temperature data (Table III–2–4).

The survey area is located in an elevation range from 690 to 1,380 meters, and the effects of elevation differences upon soil temperatures and the elevation of 196 stations are indicated in Fig. III–2–4, in which negative covariance is recognized. It is assumed that the coefficient of correlation is –0.43, and the temperature correction due to elevation difference is –0.38°C/100 meters based on the regression curve. The latter value is a little smaller in comparison with –0.46°C/100 meters obtained in the first year of survey, and the correction based upon this value is indicated in Table III–2–5.

The corrected soil temperatures on 196 survey stations show a maximum value of 28.9°C, a minimum value of 23.3°C, an average value of 26.3°C and a standard deviation value (σ) of 1.2°C. The histogram of temperature is shown in Fig. III–2–5, where the existence of two populations are suggested. The higher and lower temperatures are interfaced by a line between 26.52°C and 27.0°C. These two populations are also indicated in the cumulative frequency distribution chart (Fig. III–2–6). The threshold value which is the center of the two points made by three intersecting lines, is determined to be 26.6°C. The classes of soil temperatures were deter-

mined as $t - 2\sigma$, t, $t + \sigma$ and $t + 2\sigma$, and the said map was prepared (Fig. III–2–7).

The highest soil temperature measured was 28.9°C in station No. 135 around Itogon bridge. The map shows other strong anomalies as follows: the average soil temperature of 28.3°C in three stations and the maximum soil temperature of 28.7°C (No. 11) are in north-south and east-west directions near Virac; the average soil temperature of 28.6°C in eight stations and the maximum soil temperature of 28.9°C (No. 135) at the vicinity of Itogon Bridge to the northeast of Itogon village; and the average soil temperature of 28.2°C in three stations (Nos. 67, 87 and 88) and the maximum soil temperature of 28.5°C (No. 67) toward the north of Acupan mine dam. Small-scale anomalies of 1–2 stations are also indicated.

As a whole, significant soil temperature anomalies are widely distributed in the northern and northeastern parts of the survey area. In the northwestern and southeastern parts of the area, low soil temperatures generally prevail.

Although the southwestern part of the area, containing the survey stations No. 53, 54, 65, 66 and 77 (south side of Acupan mine exploitation adit, where steam and thermal fluid discharges occur) was expected to be a ground with high temperature zone, a low temperature anomaly was noted with the average soil temperature of 25.6°C and maximum of 26.6°C. One of the reasons for the low soil temperatures at one (1) meter depth could be due to the effect of ventilation of the underground mine workings which artificially disturbed the true temperature gradient of the surroundings.

(b) Distribution of Mercury in Soil: The total number of samples tested was 199. The maximum mercury value obtained was 7,175 ppb, the minimum value was 5 ppb. The average mercury content in soil was 84 ppb.

The standard deviation was 0.640 when the values are transformed to logarithm. Fig. III–2–8 showed the histogram of mercury concentration. It is not a typical normal distribution but has more dispersion on the side of high concentration. Fig. III–2–9 is the cumulative frequency distribution from which the threshold of 239 ppb is assumed.

In the preparation of concentration distribution map, classes are set as 1/4t, 1/2t, t, 2t and 4t, with the threshold (t) as standard.

The distribution map is shown in Fig. III–2–10, where the anomalies of high mercury concentrations are pointed out as follows: In the southwestern part of the survey area, an anomaly zone runs in the north-south direction with an average concentration of 2,312 ppb in four stations (Nos. 54, 65, 66 and 75). The highest value obtained is 4,429 ppb (No.51) in the south side adit of Acupan mine. A wide anomalous zone in fourteen stations extends from the Itogon Bridge to the Acupan mine tailings pond with an average concentration of 1,658 ppb and the highest value of 6,151 ppb (No. 103). There are other isolated high anomalous zones located in the southwestern and northeastern parts of the survey area. While the low mercury concentrations are found around the Itogon mine and within the vicinity of Virac.

(c) Distribution of Radon Gas Concentration: The Radon (222) gas concentration is indicated by the number of Radon ion tracks per one (1) square millimeter area for a period of 30 days. For the 198 samples, the maximum value obtained is 855.5 T/D and the minimum value is 1.3 T/D. The average value is 28.8 T/D. The standard deviation of logarithmically transformed data is 0.495. The histogram for the Radon gas concentration is shown in Fig, III–2–11 which represents in general a log-normal distribution. While in the cumulative frequency distribution (Fig. III–2–12), a winding point is observed near the average value of 28.8 T/D.

In the preparation of the distribution map of the Radon gas concentration, concentration classes are formulated as $a-2\sigma$, $a-\sigma$, $a+\sigma$, $a+2\sigma$, where a is taken as the average and σ as the standard deviation.

The Radon gas concentration distribution is shown in Fig. III–2–13, where high concentration anomalies are observed as follows. A north-south trending anomalous zone runs in the vicinity of Virac, with the maximum concentration of 231.8 T/D (No. 11) and the average concentration of 163.5 T/D in the four survey stations (Nos. 11, 19, 188 and 189). The southern portion of the central part of the survey area gives an average concentration of 179.1 T/D in ten stations and a maximum concentration of 298.7 T/D. The southwestern side of the area shows an average con-

centration of 297.1 T/D in eight stations and a maximum of 855.5 T/D. In addition, several anomalies on 1–2 stations are found. On the other hand, low concentration zones are widely distributed in the eastern and northwestern parts of the survey area. No other anomalous values of high Radon concentration was observed near the place of steaming area in the Acupan mine tunnel (Stations Nos. 54 and 77) and around AGH-1 gradient hole and thermal springs being manifested near the Itogon dacite plug.

All over the survey area, a northeast-southwest trend of high concentration Radon gas anomaly has been recognized. This coincides well with the inferred fault structures which run along a northeast-southwest direction.

Fig. III–2–14 shows the comprehensive distribution of the soil temperature, mercury concentration and Radon gas concentration in the surveyed area. Basically, high anomalous zones trending northeast-southwest are well defined in the area between Acupan mine and the Itogon plug. In particular, as noted in the mercury concentration distribution, positive anomalies are mainly divided into two sections, i.e., around Acupan mine and around Itogon plug. These anomalies are controlled or influenced by the plugs which are products of the younger volcanic activities. The distribution of anomalous values are observed on the peripheral part of the dacite plugs.

Furthermore, high anomalies in soil temperatures and Radon gas are noted in Virac, however, there is no sign of surface manifestation in the area.

Correlation factors were determined on the three parameters used in the survey. The results are shown in Table III–2–6. Figs. III–2–15 to III–2–17 graphically represent the respective correlation. No positive correlation is recognized among these parameters.

Table III–2–6 Correlation Coefficients Between the Different Parameters

	T	Hg (Soil)	Rn
T		–0.2	0.2
Hg (Soil)	–0.2		6.5×10^{-3}
Rn	0.2	6.5×10^{-3}	

Table Ⅲ-2-2 List of Spring Water Samples and O/H Isotope Analysis

Sample No.	Sample Location	Temperature (°C)	Discharge (ℓ/min)	PH	δ D (0/00)	$\delta^{18}O$ (0/00)	Remarks
1	AGH-1 Drill Hole	66.2	2	7.0	−58.9	−8.6	
2	Ambalanga River	73.8	3	7.0	−59.6	−9.3	
3	Acupan Mine 2900L	35.9	100	7.0	−66.7	−10.6	
4	Acupan Mine 2900L	43.5	50	7.0	−70.8	−10.8	
5	Acupan Mine 2900L	41.7	150 ~ 100	7.0	−70.2	−10.9	
6	Acupan Mine 3150L	65.0	5	7.5	−57.8	−8.1	
7	Acupan Mine 3150L	90.0	10	7.5	−56.5	−8.9	
8	Acupan Mine 3150L	65.0	2	7.0	−55.5	−8.7	
9	Acupan Mine 3150L	75.0	70	7.5	−55.2	−8.4	
10	Acupan Mine 3150L	80.0	60 ~ 50	7.5	−64.7	−10.1	
11	Acupan Mine 3150L	80.0	60 ~ 50	7.0	−68.0	−10.7	
12	Acupan Mine 3300L	57.1	25	7.0	−57.0	−7.8	
13	Acupan Mine 3300L	85.8	30 ~ 25	7.5	−59.6	−7.6	
14	Acupan Mine 2300L	32.8	100 ~ 50	7.0	−68.7	−10.3	
15	Acupan Mine Drainage Tunnel	73.1	5	7.5	−68.0	−9.5	
IT-1	Itogon Hot Spring	89.5	Total 10	7.7	−67.2	−9.8	Phase I
IT-2	Itogon Hot Spring	62.2		7.8	−67.6	−9.6	〃
BA-1	Acupan Mine 3300L	81.0	25	8.1	−62.3	−7.7	〃
BA-2	Acupan Mine 3150L	62.1	60 ~ 80	8.2	62.5	−7.6	〃
DA-ST	East of Dalupirip stream				−71.0	−10.1	〃
PRE	Precipitate at Baguio city				−66.9	−9.9	〃
Errors					± 2	± 0.1	

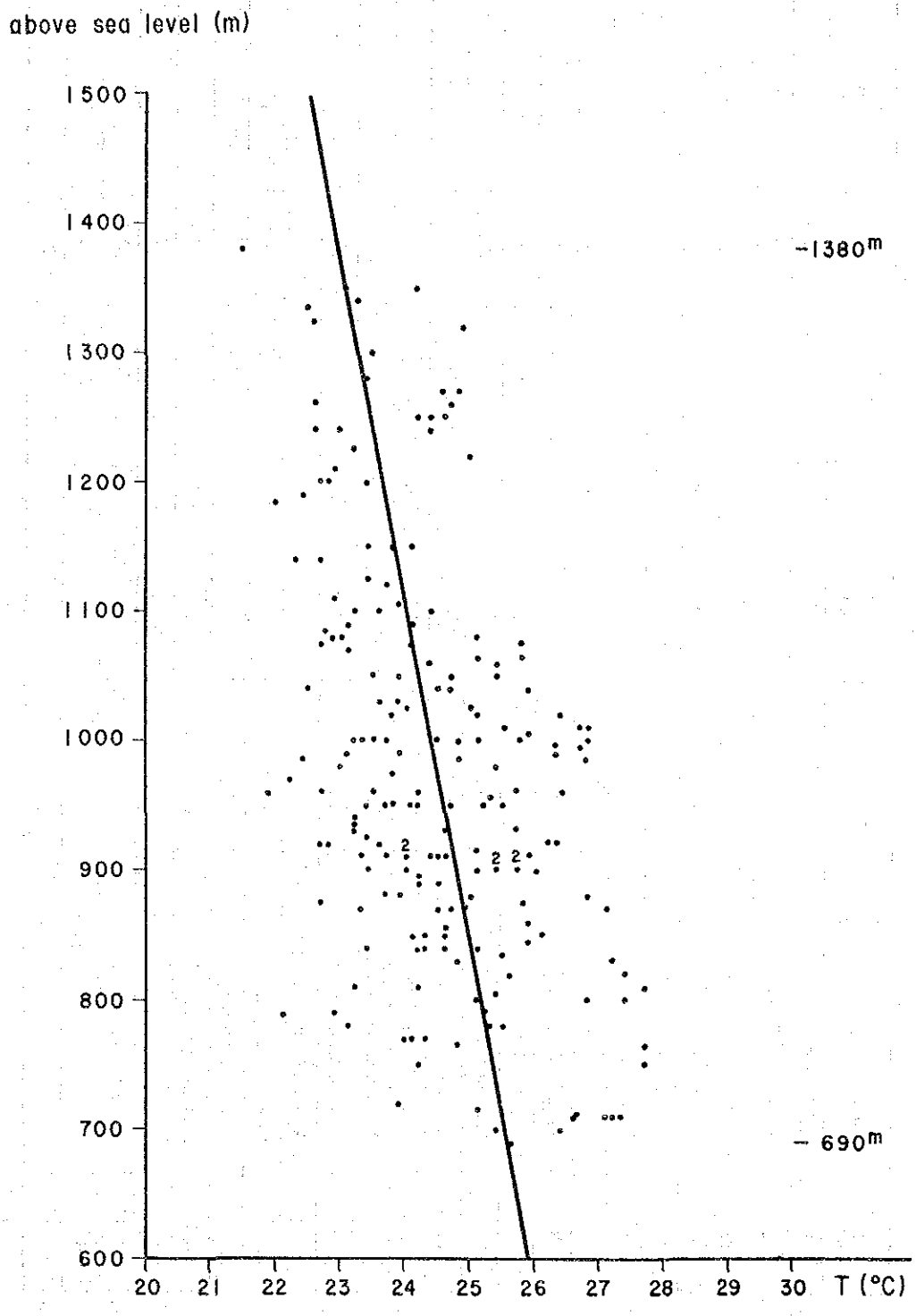


Fig. Ⅲ-2-4 1-m Depth Temperature Versus Sea Level

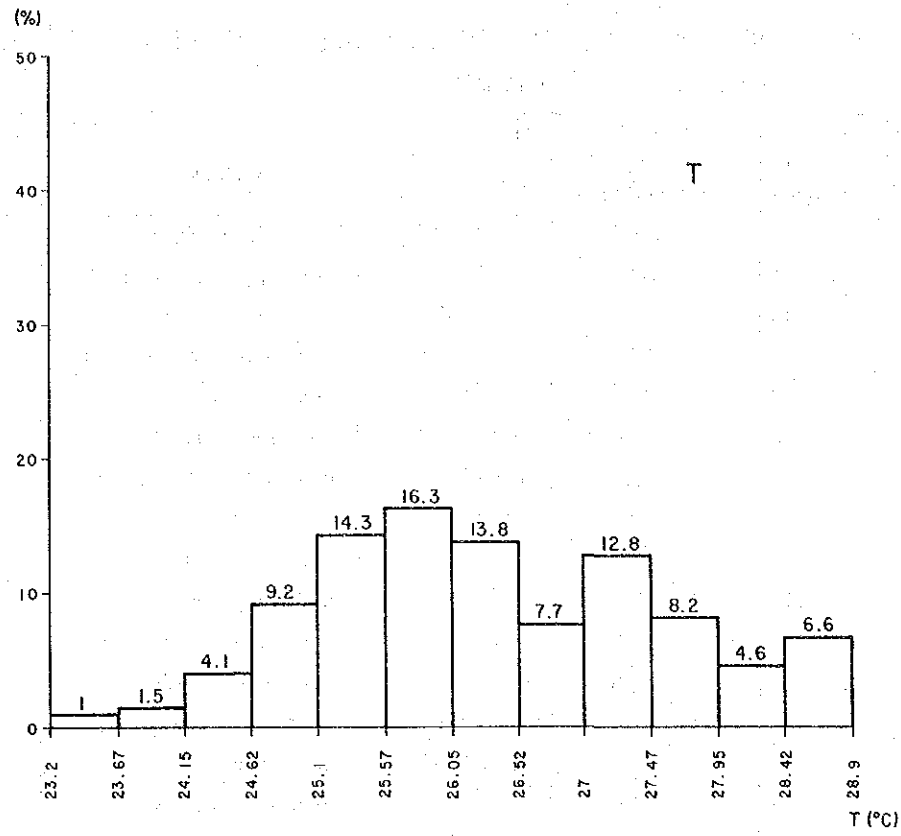


Fig. Ⅲ-2-5 Frequency Diagram of 1-m Depth Temperature

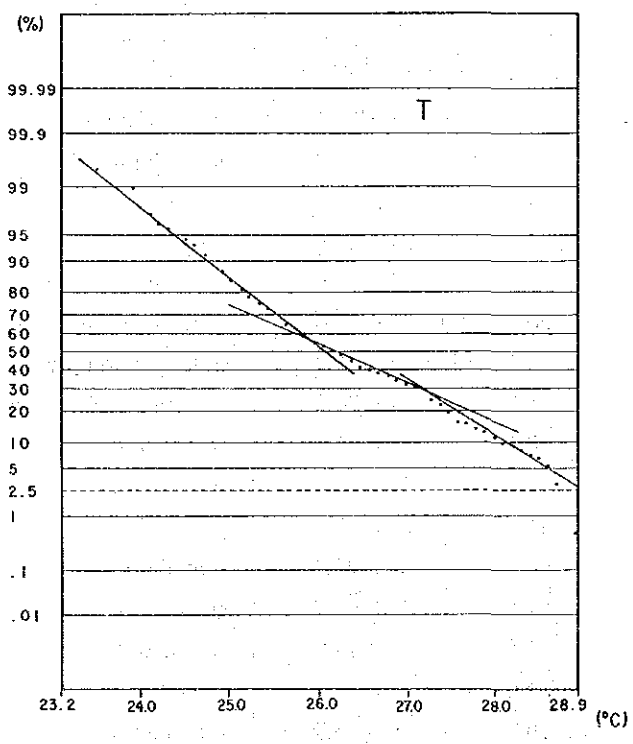


Fig. Ⅲ-2-6 Probability Plot of 1-m Depth Temperatature

Table Ⅲ-2-3 Results of Measurements of Hg, Rn, and Temperature

No. 1

Point/ Sample No.	Hg (ppb)	Results of Measurements		Geology	Remarks
		Rn (T/mm^2 30 day)	T (°C, 60cm/100cm)		
1	30	21.2	25.7/24.7	andesite porphyry	
2	41	63.0	26.8/27.2	conglo, pyroclasitic rock	
3	40	52.1	24.6/24.9	andesite porphyry	
4	51	67.6	26.6/26.8	conglo, pyroclasitic rock	
5	30	17.3	27.1/26.7	andesite porphyry	
6	30	18.6	26.4/26.3	andesite porphyry	
7	55	37.9	28.2/28.0	conglo, pyroclasitic rock	
8	70	60.8	25.5/25.6	andesite porphyry	
9	40	18.0	25.0/25.0	andesite porphyry	
10	10	77.9	26.4/26.3	andesite porphyry	
11	30	231.8	29.2/28.7	conglo, pyroclasitic rock	
12	15	30.8	28.7/28.7	conglo, pyroclasitic rock	
13	25	32.3	25.1/25.1	andesite porphyry	
14	20	72.1	26.6/26.8	andesite porphyry	
15	45	45.0	27.4/27.5	andesite porphyry	
16	109	7.2	24.1/24.9	andesite porphyry	
17	15	8.9	29.5/28.3	andesite porphyry	
18	20	26.3	28.0/23.2	conglo, pyroclasitic rock	
19	45	225.2	27.2/27.8	conglo, pyroclasitic rock	
20	20	65.0	29.7/28.6	granodiorite	
21	40	296.2	27.7/27.2	granodiorite	
22	101	7.2	25.6/26.2	granodiorite	
23	44	9.3	25.3/25.9	granodiorite	
24	163	19.5	24.3/24.0	granodiorite	
25	55	250.3	24.4/24.6	granodiorite	
26	25	95.2	25.6/26.0	andesite porphyry	
27	127	200.3	27.0/28.0	andesite porphyry	
28	635	855.5	26.2/26.3	andesite porphyry	
29	44	255.0	24.9/24.8	andesite porphyry	
30	24	18.1	24.8/25.3	granodiorite	
31	78	43.1	25.7/25.9	andesite rock	
32	54	24.4	28.6/28.6	granodiorite	
33	79	46.5	27.2/27.2	granodiorite	
34	586	41.8	25.5/25.7	granodiorite	
35	166	62.5	26.2/27.2	granodiorite	
36	50	82.0	27.8/27.5	granodiorite	
37	107	79.9	26.5/25.9	granodiorite	
38	207	77.8	25.2/25.1	granodiorite	

Point/ Sample No.	Hg (ppb)	Results of Measurements		Geology	Remarks
		Rn (T/mm^2 30 day)	T (°C. 60cm/100cm)		
39	148	153.0	25.9/25.8	andesite porphyry	
40	30	410.3	27.5/27.5	andesite porphyry	
41	74	157.1	26.5/26.5	andesite porphyry	
42	30	78.2	27.7/27.5	grano diorite	
43	74	48.2	28.0/27.8	andesite porphyry	
44	54	34.7	25.5/24.8	andesite porphyry	
45	59	37.1	26.5/26.9	andesite porphyry	
46	157	46.5	24.7/24.4	andesite porphyry	
47	331	5.7	25.6/ –	granodiorite	
48	864	12.4	24.8/25.3	granodiorite	
49	420	15.2	25.2/25.6	granodiorite	
50	351	10.4	24.6/24.9	granodiorite	
51	4429	9.0	25.4/25.5	andesite porphyry	
52	21	31.1	25.5/26.2	andesite porphyry	
53	291	18.0	24.8/25.2	andesite porphyry	
54	2460	1.3	25.0/25.2	diorite	
55	64	16.5	24.2/ –	granodiorite	
56	40	86.9	24.4/24.9	andesite porphyry	
57	89	36.3	25.8/25.9	andesite porphyry	
58	109	94.0	26.3/26.1	andesite porphyry	
59	217	86.9	26.5/26.8	granodiorite	
60	41	132.6	27.7/28.1	granodiorite	
61	385	6.2	25.5/26.1	andesite porphyry	
62	247	23.6	25.0/25.2	granodiorite	
63	25	15.1	24.9/25.0	andesite porphyry	
64	16	16.6	25.5/25.5	andesite porphyry	
65	735	18.0	25.2/25.2	granodiorite	
66	–	8.3	25.3/25.9	granodiorite	
67	202	18.9	26.7/28.5	quartz diorite	
68	109	22.0	25.0/25.1	granodiorite	
69	94	106.6	25.7/26.1	granodiorite	
70	104	28.7	24.9/25.9	granodiorite	
71	88	133.7	25.8/26.6	granodiorite	
72	42	22.0	27.1/27.4	granodiorite	
73	213	5.3	25.1/25.3	andesite porphyry	
74	88	105.0	25.8/26.1	andesite porphyry	
75	68	99.5	25.5/25.6	andesite porphyry	
76	33	50.8	24.6/25.0	andesite porphyry	

Point/ Sample No.	Hg (ppb)	Results of Measurements		Geology	Remarks
		Rn (T/mm^2 30day)	T (°C. 60cm/100cm)		
77	1624	8.3	25.7/26.6	granodiorite	
78	805	29.2	25.8/26.8	andesite porphyry	
79	649	36.3	25.7/25.6	granodiorite	
80	3051	22.4	23.8/24.0	andesite porphyry	
81	145	6.2	26.0/27.4	andesite porphyry	
82	156	67.4	26.7/26.2	andesite porphyry	
83	32	23.6	26.8/27.0	granodiorite	
84	182	298.7	26.9/27.1	dacite	
85	68	24.7	26.0/26.5	dacite	
86	151	113.6	26.0/26.4	granodiorite	
87	76	6.5	28.3/28.2	tonalite	
88	1525	14.1	27.6/27.9	tonalite	
89	1230	75.8	24.8/25.1	andesite porphyry	
90	190	38.3	25.1/25.8	andesite porphyry	
91	241	7.2	25.2/26.8	andesite porphyry	
92	370	16.6	24.9/25.6	granodiorite	
93	216	106.2	25.4/25.5	diorite ~ gabbro	
94	10	18.0	25.4/25.8	diorite ~ gabbro	
95	319	26.4	26.3/26.1	diorite ~ gabbro	
96	83	106.0	25.4/25.4	andesitic pyroclasitic rock	
97	65	78.7	26.9/27.3	granodiorite	
98	115	203.9	25.3/25.7	granodiorite	
99	4183	25.6	27.3/27.2	andesite porphyry	
100	142	75.0	25.8/26.2	andesite porphyry	
101	2608	26.8	23.0/23.2	andesite porphyry	
102	505	18.0	26.7/26.9	andesite porphyry	
103	6151	17.3	25.6/25.8	diorite ~ gabbro	
104	99	5.0	25.4/25.8	diorite ~ gabbro	
105	62	25.3	24.6/24.6	diorite ~ gabbro	
106	210	64.4	25.3/26.6	diorite ~ gabbro	
107	220	91.0	26.9/27.5	granodiorite	
108	7175	285.1	26.8/27.2	granodiorite	
109	100	268.9	25.0/25.5	granodiorite	
110	450	148.8	25.2/25.7	granodiorite	
111	375	118.2	26.8/27.4	granodiorite	
112	37	13.2	28.7/25.7	andesite porphyry	
113	1427	4.7	25.3/ –	andesite porphyry	
114	140	4.9	24.0/24.2	andesite porphyry	

Point/ Sample No.	Hg (ppb)	Results of Measurements		Geology	Remarks
		Rn (T/mm^2 30 day)	T (°C. 60cm/100cm)		
115	26	12.3	26.4/25.3	andesite porphyry	
116	149	24.9	24.0/25.0	andesite porphyry	
117	390	–	25.0/25.4	diorite ~ gabbro	Cup loss
118	273	22.6	24.4/25.5	diorite ~ gabbro	
119	80	34.0	27.2/27.7	diorite ~ gabbro	
120	275	50.0	27.2/27.6	andesite rock	
121	137	52.1	25.8/27.3	diorite ~ gabbro	
122	190	148.3	27.0/27.7	diorite ~ gabbro	
123	40	16.5	27.1/27.3	andesite porphyry	
124	2067	36.3	26.8/27.2	andesite porphyry	
125	500	26.4	27.3/28.7	andesite porphyry	
126	71	33.2	23.9/24.7	andesite porphyry	
127	185	24.1	24.8/25.2	andesite porphyry	
128	684	10.5	25.6/25.9	quartz diorite	
129	886	2.9	23.8/24.3	diorite ~ gabbro	
130	182	15.8	25.4/26.4	diorite ~ gabbro	
131	466	17.3	25.9/25.6	diorite ~ gabbro	
132	69	19.6	25.7/26.5	diorite ~ gabbro	
133	132	5.2	24.3/25.1	diorite ~ gabbro	
134	45	23.9	27.4/27.2	tonalite	
135	20	9.8	29.1/28.9	tonalite	
136	25	52.1	28.5/28.5	dacite	
137	380	14.0	25.7/26.1	tonalite	
138	41	4.4	24.7/26.4	tonalite	
139	20	15.0	24.1/24.1	quartz diorite	
140	10	29.4	25.1/25.4	tonalite	
141	30	11.0	25.3/24.9	diorite ~ gabbro	
142	257	6.0	24.6/25.4	diorite ~ gabbro	
143	108	14.0	27.6/27.4	tonalite	
144	26	20.3	25.6/26.3	tonalite	
145	36	24.1	26.4/26.7	tonalite	
146	10	6.0	23.7/24.7	tonalite	
147	116	1.4	24.4/24.7	tonalite	
148	10	–	25.5/25.5	tonalite	Cup loss
149	26	10.2	28.6/27.7	tonalite	
150	20	27.1	25.8/26.0	tonalite	
151	190	50.7	27.9/28.0	granodiorite	
152	195	5.5	25.5/25.6	granodiorite	

Point/ Sample No.	Hg (ppb)	Results of Measurements		Geology	Remarks
		Rn (%/mm^2 30 day)	T (°C. 60cm/100cm)		
153	46	44.1	25.9/26.3	andesite porphyry	
154	1033	9.0	26.7/27.9	andesitic pyroclasitic rock	
155	20	33.2	26.6/ –	andesite porphyry	
156	64	7.2	25.4/25.6	granodiorite	
157	5	12.2	24.4/25.1	andesite porphyry	
158	40	27.5	24.3/24.4	andesite rock	
159	37	14.3	25.2/25.8	diorite ~ gabbro	
160	84	12.0	24.3/25.2	diorite ~ gabbro	
161	46	5.2	25.6/25.9	tonalite	
162	95	17.3	24.5/26.2	tonalite	
163	64	3.7	24.0/25.0	tonalite	
164	77	24.9	25.7/26.4	tonalite	
165	15	24.9	24.8/25.3	tonalite	
166	16	17.3	25.2/25.9	tonalite	
167	984	18.8	24.0/24.4	diorite ~ gabbro	
168	15	10.0	27.9/28.3	quartz diorite	
169	26	10.9	28.4/28.4	quartz diorite	
170	26	14.5	26.5/23.6	quartz diorite	
171	40	10.0	25.5/26.0	quartz diorite	
172	10	9.0	27.8/27.5	tonalite	
173	20	12.7	26.7/26.9	tonalite	
174	15	12.7	28.5/28.5	tonalite	
175	10	18.2	28.3/28.6	tonalite	
176	10	11.8	28.9/28.7	tonalite	
177	5	6.3	27.2/27.2	tonalite	
178	20	28.3	26.7/27.4	quartz diorite	
179	10	15.5	28.6/28.6	quartz diorite	
180	15	10.0	26.4/26.4	quartz diorite	
181	10	11.8	26.6/26.9	quartz diorite	
182	20	10.9	25.9/26.4	quartz diorite	
183	5	8.1	28.1/28.7	tonalite	
184	54	18.2	23.8/24.2	conglo, pyroclasitic rock	
185	63	23.1	27.2/24.0	conglo, pyroclasitic rock	
186	15	90.7	28.0/27.9	conglo, pyroclasitic rock	
187	57	21.1	24.6/24.8	andesite porphyry	
188	30	108.3	24.8/25.0	andesite porphyry	
189	109	88.8	25.4/25.6	andesite porphyry	
190	49	74.3	27.2/27.1	conglo, pyroclasitic rock	

Point/ Sample No.	Hg (ppb)	Results of Measurements		Geology	Remarks
		Rn (T/mm^2 30 day)	T (°C. 60cm/100cm)		
191	100	46.3	26.6/27.0	andesite porphyry	
192	156	36.6	25.2/25.4	conglo, pyroclasitic rock	
193	26	26.5	28.0/27.5	tonalite	
194	26	44.9	27.2/27.3	andesite porphyry	
195	10	245.4	26.1/26.4	andesite porphyry	
196	31	39.8	26.4/26.6	andesite porphyry	
197	37	73.5	27.7/27.4	andesite porphyry	
198	21	78.6	26.9/27.2	andesite porphyry	
199	5	59.2	25.5/25.6	andesite porphyry	
200	675	114.7	26.4/26.3	andesite porphyry	

Table Ⅲ-2-4 Daily Record of 1-m Depth Temperature at Station Point

Stationary measurement			Stationary measurement		
Data Time (AM) (PM)	Ambient (°C) (AM) (PM)	Ambient (°C) (AM) (PM)	Data Time (AM) (PM)	Ambient (°C) (AM) (PM)	Ambient (°C) (AM) (PM)
Oct. 6. 83 7:03 / 4:35	18.9 / 26.4	22.0 / 22.0	Oct. 21. 83 7:05 / 5:10	20.6 / 20.5	22.0 / 22.0
Oct. 7. 83 6:53 / 4:47	19.7 / 20.9	22.0 / 22.0	Oct. 22. 83 7:00 / 6:30	20.2 / 20.0	22.0 / 22.0
Oct. 8. 83 7:04 / 5:00	19.7 / 20.7	22.0 / 22.0	Oct. 23. 83 – / 5:06	– / 21.8	– / 22.0
Oct. 9. 83 7:00 / 4:57	18.8 / 22.0	22.1 / 22.1	Oct. 24. 83 6:55 / 5:00	19.6 / 21.8	22.0 / 22.0
Oct. 10. 83 6:44 / 5:04	19.7 / 21.8	22.1 / 22.1	Oct. 24. 83 7:00 / 4:58	19.6 / 23.4	22.0 / 22.0
Oct. 11. 83 7:00 / 4:55	19.4 / 18.8	22.1 / 22.1	Oct. 26. 83 7:05 / 5:12	18.7 / 21.9	22.0 / 22.0
Oct. 12. 83 7:00 / 4:50	17.3 / 20.8	22.1 / 22.1	Oct. 27. 83 7:02 / 4:55	20.3 / 22.2	21.9 / 21.9
Oct. 13. 83 6:52 / 4:53	19.1 / 25.4	22.2 / 22.1	Oct. 28. 83 7:05 / 5:12	19.4 / 22.1	21.9 / 21.9
Oct. 14. 83 6:56 / 4:56	18.8 / 22.5	22.1 / 22.1	Oct. 29. 83 7:02 / 5:06	18.6 / 20.8	21.9 / 21.9
Oct. 15. 83 7:00 / 5:01	20.8 / 23.0	22.0 / 22.0	Oct. 30. 83 7:00 / 5:00	18.1 / 22.1	21.9 / 21.9
Oct. 16. 83 7:00 / 4:55	20.9 / 23.5	22.0 / 22.0	Oct. 31. 83 6:54 / 5:00	18.6 / 19.3	21.9 / 21.9
Oct. 17. 83 6:58 / 5:07	18.2 / 20.1	22.0 / 22.0	Nov. 1. 83 7:00 / 5:00	19.3 / 20.7	21.9 / 21.9
Oct. 18. 83 6:58 / 5:00	19.2 / 24.4	22.0 / 22.0	Nov. 2. 83 6:55 / 5:00	18.8 / 21.0	21.9 / 21.9
Oct. 19. 83 6:55 / 5:00	18.8 / 22.9	22.0 / 22.0	Nov. 3. 83 6:56 / 5:00	19.6 / 21.2	21.9 / 21.9
Oct. 20. 83 7:01 / 5:00	18.7 / 20.2	22.0 / 22.0	Nov. 4. 83 6:56 / 4:51	19.4 / 20.9	21.9 / 21.9

Table Ⅲ-2-5 Calculation Table of 1-m Depth Temperature

(Standard point 500 m)

No. 1

Point Sample No.	Data	Bottom T. measured (°C) (60cm) / (100cm)	Elevation (m)	Elevation adjustment (°C)	Dally adjustment (°C)	Temp. corrected (°C) (60cm) / (100cm)	Remarks
1	Oct. 6. 83	23.3 / 22.3	1140	2.4		25.7 / 24.7	
2	Oct. 6. 83	24.7 / 25.1	1065	2.1		26.8 / 27.2	
3	Oct. 6. 83	22.4 / 22.7	1075	2.2		24.6 / 24.9	
4	Oct. 6. 83	24.5 / 24.7	1050	2.1		26.6 / 26.8	
5	Oct. 7. 83	24.8 / 24.4	1100	2.3		27.1 / 26.7	
6	Oct. 7. 83	24.2 / 24.1	1090	2.2		26.4 / 26.3	
7	Oct. 6. 83	26.1 / 25.9	1040	2.1		28.2 / 28.0	
8	Oct. 17. 83	23.4 / 23.5	1050	2.1		25.5 / 25.6	
9	Oct. 7. 83	22.8 / 22.8	1085	2.2		25.0 / 25.0	
10	Oct. 7. 83	24.2 / 24.1	1075	2.2		26.4 / 26.3	
11	Oct. 6. 83	27.3 / 26.8	1000	1.9		29.2 / 28.7	
12	Oct. 6. 83	26.8 / 26.8	1010	1.9		28.7 / 28.7	
13	Oct. 17. 83	23.2 / 23.2	1000	1.9		25.1 / 25.1	
14	Oct. 7.83	24.5 / 24.7	1040	2.1		26.6 / 26.8	
15	Oct. 7. 83	25.3 / 25.4	1060	2.1		27.4 / 27.5	
16	Oct. 24. 83	22.4 / 23.2	940	1.7		24.1 / 24.9	
17	Oct. 6. 83	27.6 / 26.4	995	1.9		29.5 / 28.3	
18	Oct. 6. 83	26.1 / 26.3	990	1.9		28.0 / 28.2	
19	Oct. 17. 83	25.3 / 25.9	1005	1.9		27.2 / 27.8	
20	Oct. 7. 83	27.8 / 26.7	995	1.9		29.7 / 28.6	
21	Oct. 7. 83	26.0 / 25.5	950	1.7		27.7 / 27.2	
22	Oct. 24. 83	24.0 / 24.6	910	1.6		25.6 / 26.2	
23	Oct. 24. 83	23.6 / 24.6	950	1.7		25.3 / 25.9	
24	Oct. 24. 83	22.5 / 22.2	970	1.8		24.3 / 24.0	
25	Oct. 10. 83	21.8 / 22.0	1185	2.6		24.4 / 24.6	
26	Oct. 10. 83	22.8 / 23.2	1225	2.8		25.6 / 26.0	
27	Oct. 10. 83	24.0 / 24.9	1320	3.1		27.1 / 28.0	
28	Oct. 10. 83	23.0 / 23.1	1350	3.2		26.2 / 26.3	
29	Oct. 10. 83	21.6 / 21.5	1380	3.3		24.9 / 24.8	
30	Oct. 18. 83	23.2 / 23.7	910	1.6		24.8 / 25.3	
31	Oct. 6. 83	24.0 / 24.2	960	1.7		25.7 / 25.9	
32	Oct. 17. 83	26.7 / 26.7	1010	1.9		28.6 / 28.6	
33	Oct. 17. 83	25.4 / 25.4	980	1.8		27.2 / 27.2	
34	Oct. 7. 83	24.0 / 24.2	890	1.5		25.5 / 25.7	
35	Oct. 10. 83	24.3 / 25.3	1000	1.9		26.2 / 27.2	
36	Oct. 10. 83	25.7 / 25.4	1050	2.1		27.8 / 27.5	
37	Oct. 10. 83	24.2 / 23.6	1100	2.3		26.5 / 25.9	
38	Oct. 10. 83	22.8 / 22.7	1140	2.4		25.2 / 25.1	

Point Sample No.	Data	Bottom T. measured (°C) (60cm)	(100cm)	Elevation (m)	Elevation adjustment (°C)	Daily adjustment (°C)	Temp. corrected (°C) (60cm)	(100cm)	Remarks
39	Oct. 10. 83	23.1	23.0	1240	2.8		25.9	25.8	
40	Oct. 10. 83	24.6	24.6	1270	2.9		27.5	27.5	
41	Oct. 10. 83	23.3	23.3	1340	3.2		26.5	26.5	
42	Oct. 18. 83	26.4	26.2	840	1.3		27.7	27.5	
43	Oct. 6. 83	26.4	26.2	920	1.6		28.0	27.8	
44	Oct. 6. 83	23.9	23.2	930	1.6		25.5	24.8	
45	Oct. 17. 83	25.0	25.4	900	1.5		26.5	26.9	
46	Oct. 17. 83	23.5	23.2	810	1.2		24.7	24.4	
47	Oct. 7. 83	24.0	–	860	1.4		25.6	–	
48	Oct. 14. 83	23.4	23.9	880	1.4		24.8	25.3	
49	Oct. 14. 83	23.6	24.0	910	1.6		25.2	25.6	
50	Oct. 14. 83	23.0	23.3	910	1.6		24.6	24.9	
51	Oct. 14. 83	23.7	23.8	950	1.7		25.4	25.5	
52	Oct. 24. 83	23.2	23.9	1105	2.3		25.5	26.2	
53	Oct. 14. 83	22.6	23.0	1080	2.2		24.8	25.2	
54	Oct. 14. 83	22.7	22.9	1110	2.3		25.0	25.2	
55	Oct. 18. 83	23.1	–	780	1.1		24.2	–	
56	Oct. 6. 83	22.9	23.4	900	1.5		24.4	24.9	
57	Oct. 18. 83	24.5	24.6	855	1.3		25.8	25.9	
58	Oct. 18. 83	25.0	24.8	830	1.3		26.3	26.1	
59	Oct. 17. 83	25.3	25.6	820	1.2		26.5	26.8	
60	Oct. 12. 83	26.0	26.4	960	1.7		27.7	28.1	
61	Oct. 14. 83	23.9	24.5	910	1.6		25.5	26.1	
62	Oct. 14. 83	23.4	23.6	920	1.6		25.0	25.2	
63	Oct. 24. 83	22.3	22.4	1190	2.6		24.9	25.0	
64	Oct. 24. 83	23.2	23.2	1100	2.3		25.5	25.5	
65	Oct. 14. 83	23.3	23.3	1000	1.9		25.2	25.2	
66	Oct. 14. 83	23.3	23.9	1030	2.0		25.3	25.9	
67	Oct. 19. 83	25.6	27.4	800	1.1		26.7	28.5	
68	Oct. 18. 83	23.6	23.7	880	1.4		25.0	25.1	
69	Oct. 18. 83	24.3	24.7	870	1.4		25.7	26.1	
70	Oct. 12. 83	23.6	24.6	850	1.3		24.9	25.9	
71	Oct. 12. 83	24.3	25.1	900	1.5		25.8	26.6	
72	Oct. 12. 83	25.2	25.5	1010	1.9		27.1	27.4	
73	Oct. 12. 83	22.9	23.1	1070	2.2		25.1	25.3	
74	Oct. 12. 83	23.1	23.4	1200	2.7		25.8	26.1	
75	Oct. 12. 83	22.8	22.9	1210	2.7		25.5	25.6	
76	Oct. 12. 83	22.3	22.7	1100	2.3		24.6	25.0	
77	Oct. 14. 83	23.6	24.5	1040	2.1		25.7	26.6	

Point Sample No.	Data	Bottom T. measured (°C) (60cm) / (100cm)	Elevation (m)	Elevation adjustment (°C)	Daily adjustment (°C)	Temp. corrected (°C) (60cm) / (100cm)	Remarks
78	Oct. 18. 83	24.6 / 25.6	805	1.2		25.8 / 26.8	
79	Oct. 18. 83	24.4 / 24.3	840	1.3		25.7 / 25.6	
80	Oct. 28. 83	22.7 / 22.9	790	1.1		23.8 / 24.0	
81	Oct. 13. 83	24.7 / 26.1	850	1.3		26.0 / 27.4	
82	Oct. 13. 83	25.1 / 24.6	930	1.6		26.7 / 26.2	
83	Oct. 13. 83	24.8 / 25.0	1025	2.0		26.8 / 27.0	
84	Oct. 12. 83	24.0 / 24.2	1250	2.9		26.9 / 27.1	
85	Oct. 12. 83	23.0 / 23.5	1300	3.0		26.0 / 26.5	
86	Oct. 12. 83	23.0 / 23.4	1280	3.0		26.0 / 26.4	
87	Oct. 20. 83	26.9 / 26.8	880	1.4		28.3 / 28.2	
88	Oct. 20. 83	26.5 / 26.8	800	1.1		27.6 / 27.9	
89	Oct. 19. 83	23.8 / 24.1	770	1.0		24.8 / 25.1	
90	Oct. 28. 83	24.1 / 24.8	765	1.0		25.1 / 25.8	
91	Oct. 28. 83	23.9 / 25.5	835	1.3		25.2 / 26.8	
92	Oct. 28. 83	23.3 / 24.0	910	1.6		24.9 / 25.6	
93	Oct. 13. 83	22.7 / 22.8	1200	2.7		25.4 / 25.5	
94	Oct. 13. 83	23.0 / 23.4	1125	2.4		25.4 / 25.8	
95	Oct. 13. 83	23.9 / 23.7	1120	2.4		26.3 / 26.1	
96	Oct. 12. 83	22.6 / 22.6	1240	2.8		25.4 / 25.4	
97	Oct. 12. 83	24.0 / 24.4	1250	2.9		26.9 / 27.3	
98	Oct. 12. 83	22.2 / 22.6	1325	3.1		25.3 / 25.7	
99	Oct. 20. 83	25.8 / 25.7	890	1.5		27.3 / 27.2	
100	Oct. 19. 83	24.7 / 25.1	800	1.1		25.8 / 26.2	
101	Oct. 19. 83	21.9 / 22.1	790	1.1		23.0 / 23.2	
102	Oct. 28. 83	25.0 / 25.2	950	1.7		26.7 / 26.9	
103	Oct. 28. 83	23.9 / 24.1	950	1.7		25.6 / 25.8	
104	Oct. 28. 83	23.5 / 23.9	990	1.9		25.4 / 25.8	
105	Oct. 28. 83	22.5 / 22.5	1040	2.1		24.6 / 24.6	
106	Oct. 28. 83	22.8 / 24.1	1150	2.5		25.3 / 26.6	
107	Oct. 13. 83	24.0 / 24.6	1250	2.9		26.9 / 27.5	
108	Oct. 13. 83	24.0 / 24.4	1240	2.8		26.8 / 27.2	
109	Oct. 13. 83	22.1 / 22.6	1260	2.9		25.0 / 25.5	
110	Oct. 13. 83	22.0 / 22.5	1335	3.2		25.2 / 25.7	
111	Oct. 13. 83	23.6 / 24.2	1350	3.2		26.8 / 27.4	
112	Oct. 20. 83	27.2 / 24.2	895	1.5		28.7 / 25.7	
113	Oct. 19. 83	24.2 / —	800	1.1		25.3 / —	
114	Oct. 19. 83	22.9 / 23.1	780	1.1		24.0 / 24.2	
115	Oct. 19. 83	25.4 / 24.3	770	1.0		26.4 / 25.3	
116	Oct. 25. 83	23.0 / 24.0	770	1.0		24.0 / 25.0	

Point Sample No.	Data	Bottom T. measured (°C) (60cm) / (100cm)	Elevation (m)	Elevation adjustment (°C)	Daily adjustment (°C)	Temp. corrected (°C) (60cm) / (100cm)	Remarks
117	Oct. 25. 83	23.8 / 24.2	810	1.2		25.0 / 25.4	
118	Oct. 25. 83	23.1 / 24.2	840	1.3		24.4 / 25.5	
119	Oct. 13. 83	24.5 / 25.0	1220	2.7		27.2 / 27.7	
120	Oct. 13. 83	24.3 / 24.7	1260	2.9		27.2 / 27.6	
121	Oct. 25. 83	23.6 / 25.1	1080	2.2		25.8 / 27.3	
122	Oct. 13. 83	24.1 / 24.8	1270	2.9		27.0 / 27.7	
123	Oct. 20. 83	25.7 / 25.9	860	1.4		27.1 / 27.3	
124	Oct. 20. 83	25.4 / 25.8	875	1.4		26.8 / 27.2	
125	Oct. 19. 83	26.3 / 27.7	750	1.0		27.3 / 28.7	
126	Oct. 25. 83	23.1 / 23.9	720	0.8		23.9 / 24.7	
127	Oct. 25. 83	23.8 / 24.2	750	1.0		24.8 / 25.2	
128	Oct. 25. 83	24.2 / 24.5	870	1.4		25.6 / 25.9	
129	Oct. 25. 83	22.2 / 22.7	920	1.6		23.8 / 24.3	
130	Oct. 25. 83	23.5 / 24.5	990	1.9		25.4 / 26.4	
131	Oct. 25. 83	23.9 / 23.6	1030	2.0		25.9 / 25.6	
132	Oct. 25. 83	23.6 / 24.4	1060	2.1		25.7 / 26.5	
133	Oct. 25. 83	22.1 / 22.9	1080	2.2		24.3 / 25.1	
134	Oct. 20. 83	26.1 / 25.9	845	1.3		27.4 / 27.2	
135	Oct. 20. 83	27.9 / 27.7	810	1.2		29.1 / 28.9	
136	Oct. 20. 83	27.2 / 27.2	830	1.3		28.5 / 28.5	
137	Oct. 19. 83	25.0 / 25.4	690	0.7		25.7 / 26.1	
138	Oct. 26. 83	23.6 / 25.3	780	1.1		24.7 / 26.4	
139	Oct. 26. 83	22.7 / 22.7	875	1.4		24.1 / 24.1	
140	Oct. 26. 83	23.8 / 24.1	850	1.3		25.1 / 25.4	
141	Oct. 27. 83	23.6 / 23.2	935	1.7		25.3 / 24.9	
142	Oct. 27. 83	22.9 / 23.7	950	1.7		24.6 / 25.4	
143	Oct. 20. 83	26.8 / 26.6	710	0.8		27.6 / 27.4	
144	Oct. 26. 83	24.2 / 24.9	870	1.4		25.6 / 26.3	
145	Oct. 26. 83	24.8 / 25.1	915	1.6		26.4 / 26.7	
146	Oct. 26. 83	22.3 / 23.3	870	1.4		23.7 / 24.7	
147	Oct. 26. 83	23.1 / 23.4	840	1.3		24.4 / 24.7	
148	Oct. 26. 83	24.0 / 24.0	900	1.5		25.5 / 25.5	
149	Oct. 27. 83	26.7 / 25.8	1000	1.9		28.6 / 27.7	
150	Oct. 27. 83	23.7 / 23.9	1050	2.1		25.8 / 26.0	
151	Oct. 10. 83	25.7 / 25.8	1075	2.2		27.9 / 28.0	
152	Oct. 10. 83	23.9 / 24.0	925	1.6		25.5 / 25.6	
153	Oct. 12. 83	23.4 / 23.8	1150	2.5		25.9 / 26.3	
154	Oct. 19. 83	25.9 / 27.1	710	0.8		26.7 / 27.9	
155	Oct. 24. 83	24.6 / –	1030	2.0		26.6 / –	

Point Sample No.	Data	Bottom T. measured (°C) (60cm) / (100cm)	Elevation (m)	Elevation adjustment (°C)	Daily adjustment (°C)	Temp. corrected (°C) (60cm) / (100cm)	Remarks
156	Oct. 24. 83	23.5 / 23.7	1000	1.9		25.4 / 25.6	
157	Oct. 24. 83	22.7 / 23.4	950	1.7		24.4 / 25.1	
158	Oct. 24. 83	22.7 / 22.8	920	1.6		24.3 / 24.4	
159	Oct. 25. 83	23.2 / 23.8	1020	2.0		25.2 / 25.8	
160	Oct. 25. 83	22.6 / 23.5	960	1.7		24.3 / 25.2	
161	Oct. 26. 83	24.3 / 24.6	840	1.3		25.6 / 25.9	
162	Oct. 26. 83	23.7 / 25.4	700	0.8		24.5 / 26.2	
163	Oct. 27. 83	22.4 / 23.4	925	1.6		24.0 / 25.0	
164	Oct. 27. 83	23.8 / 24.5	1000	1.9		25.7 / 26.4	
165	Oct. 27. 83	22.6 / 23.1	1090	2.2		24.8 / 25.3	
166	Oct. 27. 83	22.7 / 23.4	1150	2.5		25.2 / 25.9	
167	Oct. 28. 83	22.3 / 22.7	960	1.7		24.0 / 24.4	
168	Oct. 31. 83	25.8 / 26.2	1065	2.1		27.9 / 28.3	
169	Oct. 31. 83	26.4 / 26.4	1020	2.0		28.4 / 28.4	
170	Oct. 31. 83	24.8 / 21.9	960	1.7		26.5 / 23.6	
171	Oct. 31. 83	23.9 / 24.4	910	1.6		25.5 / 26.0	
172	Oct. 31. 83	26.3 / 26.0	900	1.5		27.8 / 27.5	
173	Oct. 31. 83	25.2 / 25.4	900	1.5		26.7 / 26.9	
174	Oct. 31. 83	27.1 / 27.1	870	1.4		28.5 / 28.5	
175	Oct. 31. 83	27.1 / 27.4	820	1.2		28.3 / 28.6	
176	Oct. 31. 83	27.9 / 27.7	765	1.0		28.9 / 28.7	
177	Oct. 31. 83	26.4 / 26.4	700	0.8		27.2 / 27.2	
178	Oct. 31. 83	24.8 / 25.5	1000	1.9		26.7 / 27.4	
179	Oct. 31. 83	26.8 / 26.8	985	1.8		28.6 / 28.6	
180	Oct. 31. 83	25.0 / 25.0	880	1.4		26.4 / 26.4	
181	Oct. 31. 83	25.5 / 25.8	780	1.1		26.6 / 26.9	
182	Oct. 31. 83	25.1 / 25.6	715	0.8		25.9 / 26.4	
183	Oct. 31. 83	27.3 / 27.9	710	0.8		28.1 / 28.7	
184	Nov. 3. 83	22.0 / 22.4	985	1.8		23.8 / 24.2	
185	Nov. 3. 83	25.5 / 25.3	955	1.7		27.2 / 27.0	
186	Nov. 3. 83	26.4 / 26.3	920	1.6		28.0 / 27.9	
187	Nov. 3. 83	22.8 / 23.0	980	1.8		24.6 / 24.8	
188	Nov. 3. 83	22.9 / 23.1	990	1.9		24.8 / 25.0	
189	Nov. 3. 83	23.6 / 23.8	975	1.8		25.4 / 25.6	
190	Nov. 3. 83	25.2 / 25.1	1020	2.0		27.2 / 27.1	
191	Nov. 3. 83	24.7 / 25.1	1000	1.9		26.6 / 27.0	
192	Nov. 3. 83	23.3 / 23.5	1000	1.9		25.2 / 25.4	
193	Nov. 4. 83	26.4 / 25.9	910	1.6		28.0 / 27.5	
194	Nov. 4. 83	25.6 / 25.7	930	1.6		27.2 / 27.3	

Point Sample No.	Data	Bottom T. measured (°C) (60cm)	(100cm)	Elevation (m)	Elevation adjustment (°C)	Daily adjustment (°C)	Temp. corrected (°C) (60cm)	(100cm)	Remarks
195	Nov. 4. 83	24.4	24.7	950	1.7		26.1	26.4	
196	Nov. 4. 83	24.6	24.8	985	1.8		26.4	26.6	
197	Nov. 4. 83	26.0	25.7	960	1.7		27.7	27.4	
198	Nov. 4. 83	25.4	25.7	900	1.5		26.9	27.2	
199	Nov. 4. 83	24.2	24.3	850	1.3		25.5	25.6	
200	Nov. 4. 83	25.3	25.2	790	1.1		26.4	26.3	

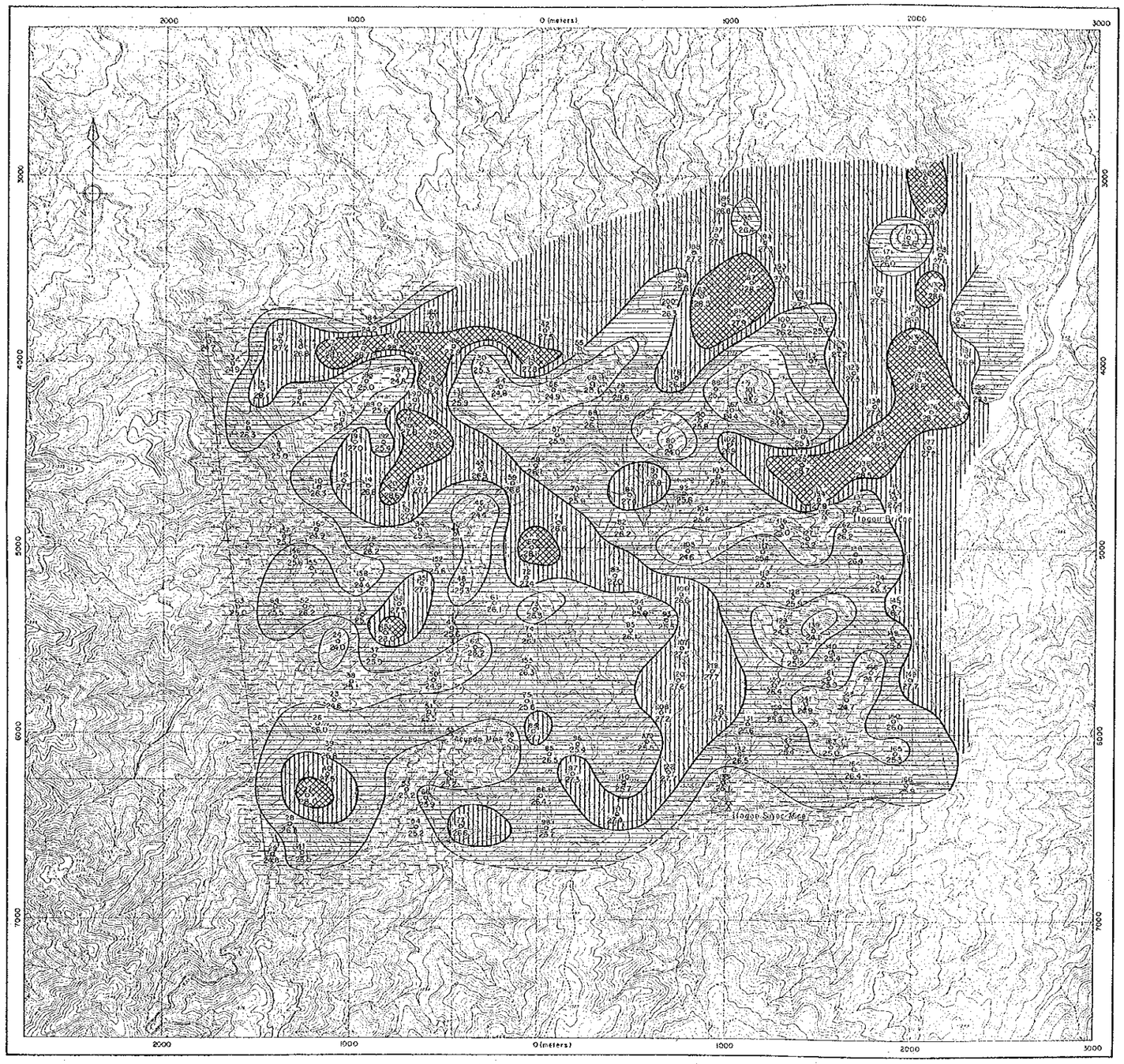


Fig. Ⅲ-2-7 Contour Map of 1-m Depth Temperature

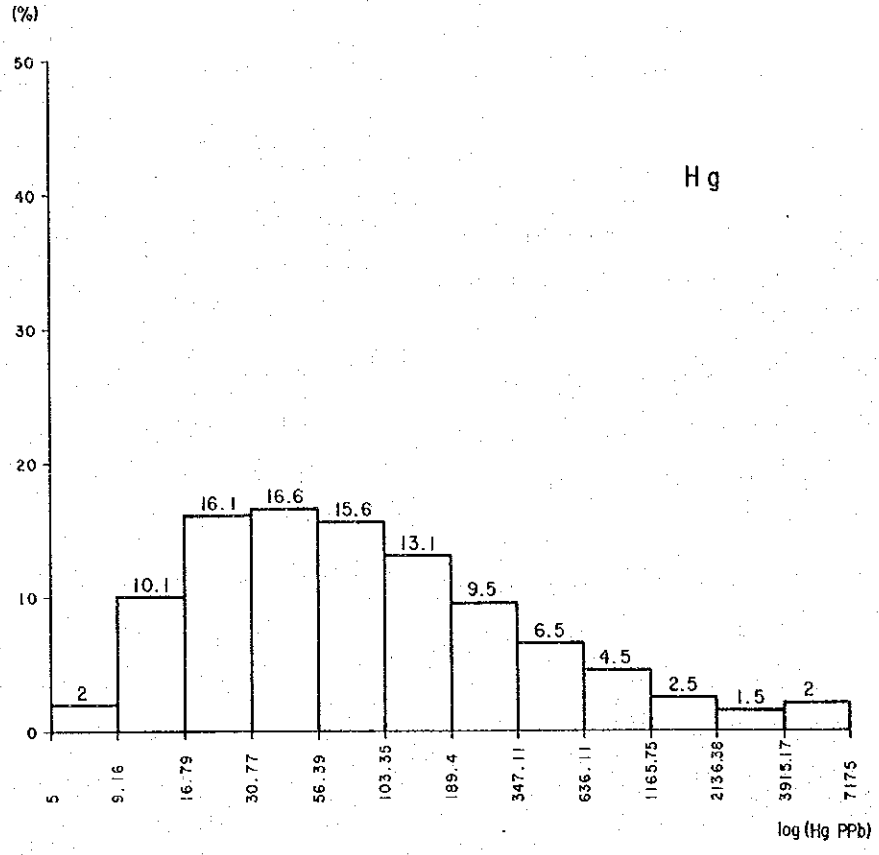


Fig. Ⅲ-2-8 Frequency Diagram of Hg Contents in Soil

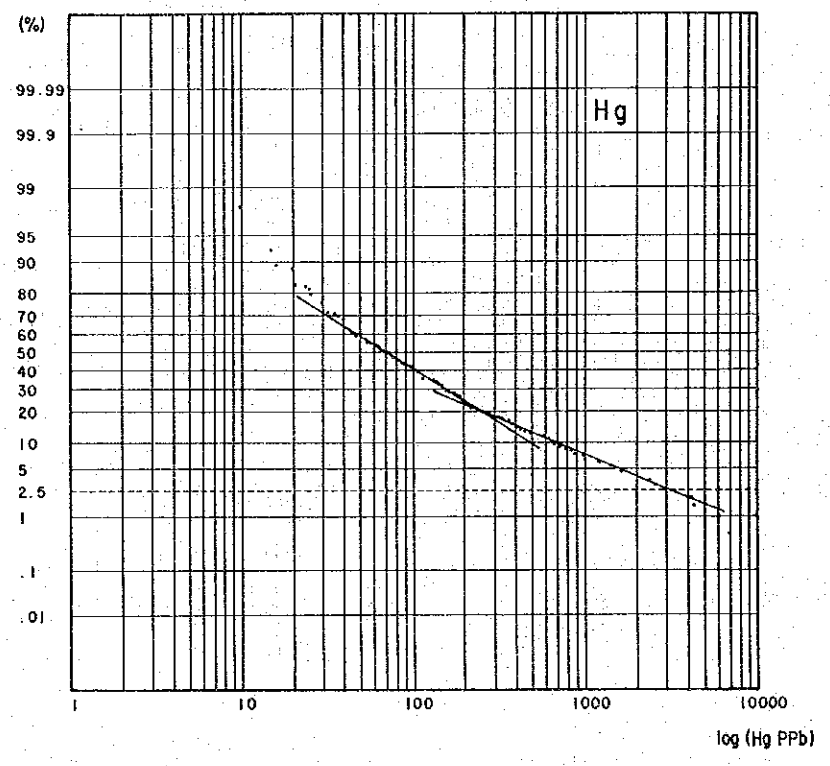
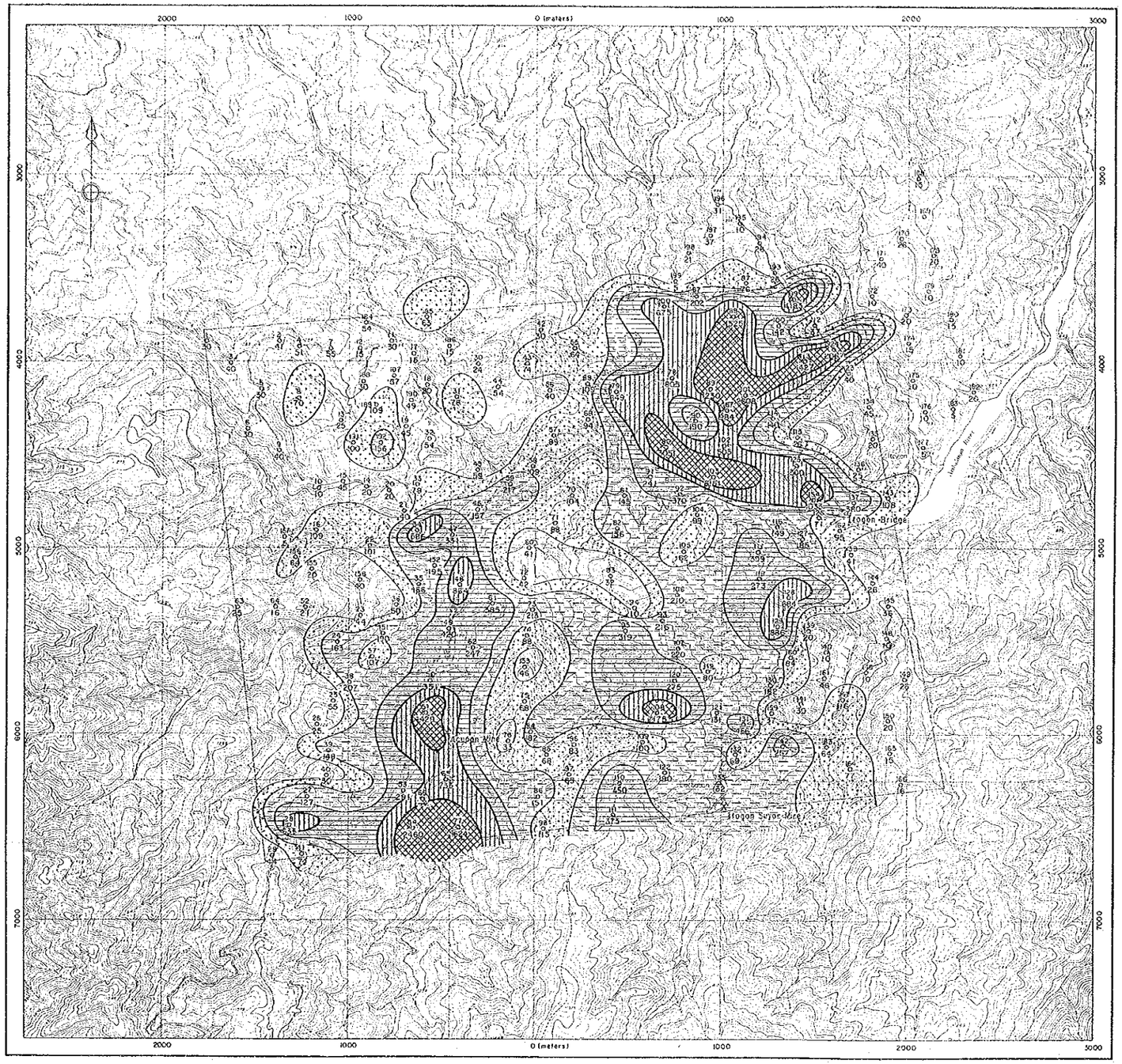


Fig. Ⅲ-2-9 Probability Plot of Hg Contents in Soil



LEGEND

- 12 Hole No
- O Soil Sampling Points
- 21.2 Hg (ppb)
- 956<
- 478 ~ 955
- 239 ~ 477
- 119 ~ 239
- 59 ~ 118
- 58 >
- Survey Area

0 500 1000m

Fig. Ⅲ-2-10 Contour Map of Hg Contents in Soil

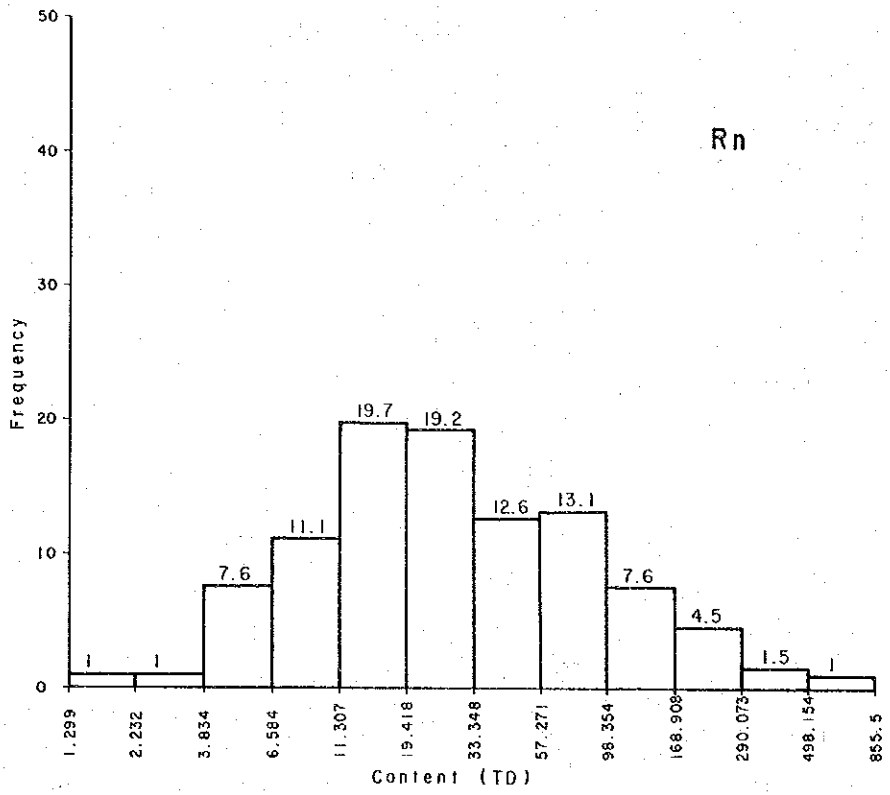


Fig. Ⅲ-2-11 Frequency Diagram of Rn Contents in Soil

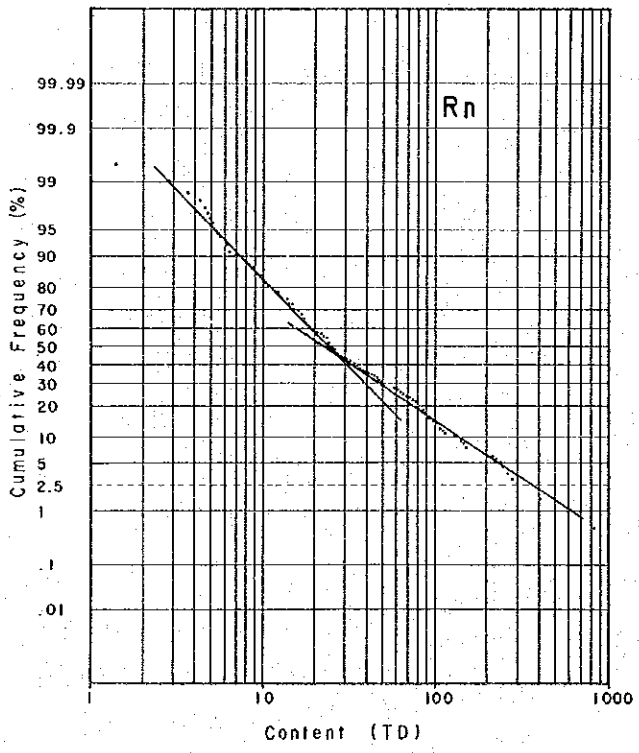
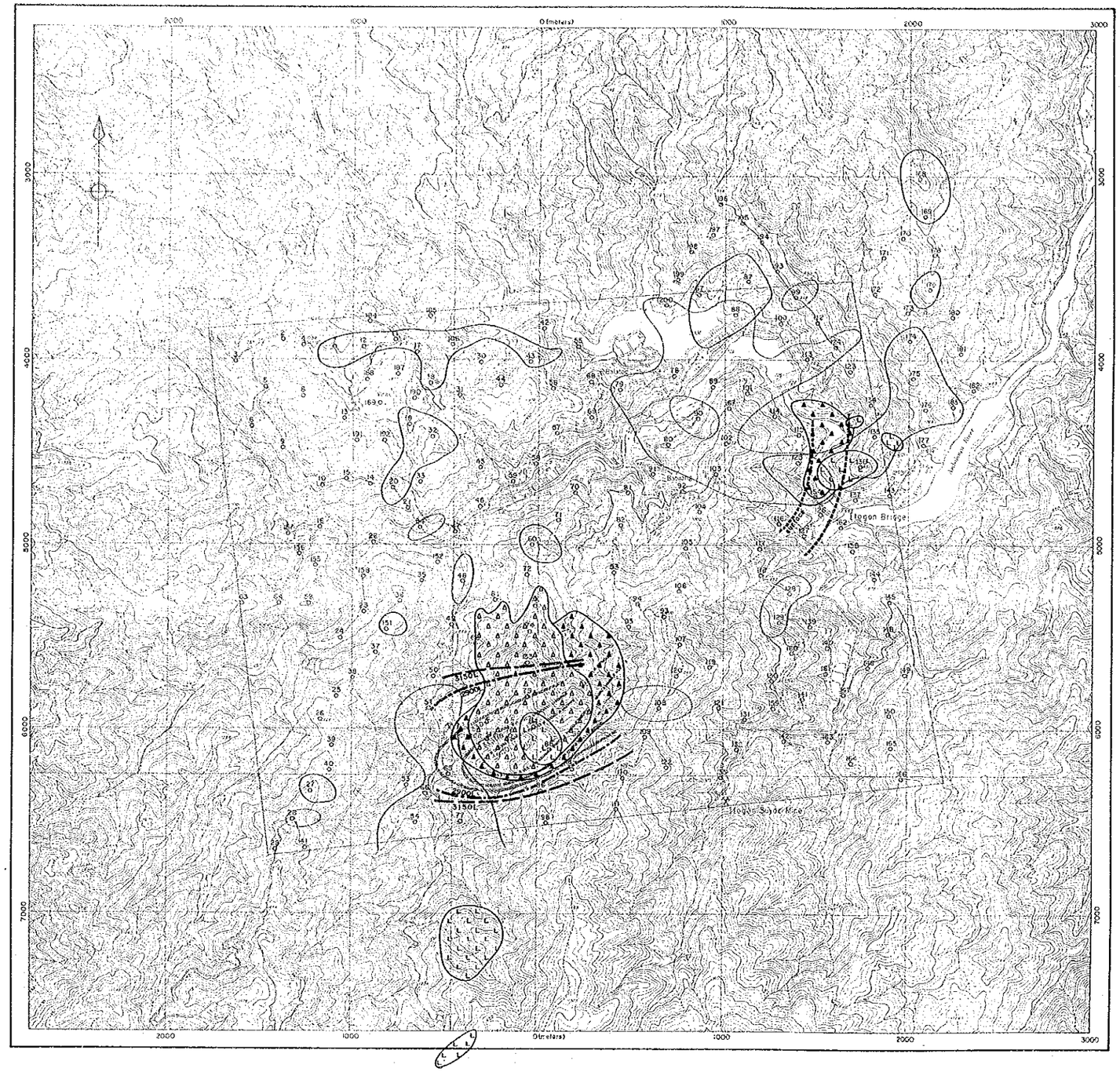


Fig. Ⅲ-2-12 Probability Plot of Rn Contents in Soil

Fig. Ⅲ-2-13 Contour Map of Rn (222) Gass Contents in Soil Air



LEGEND

- 12 O — Hole No. Sampling Points
- Temp 27.8°C<
- Hg 478 ppb<
- Rn 90 1/b <
- $\delta^{18}O$: −8.3<
- $\delta^{18}O$: −9.7≤ <8.3
- Others $\delta^{18}O$: <9.7
- Plug
- Survey Area

0 500 1000m

Fig. Ⅲ-2-14 Compiled Map of Geochemical Anomalies

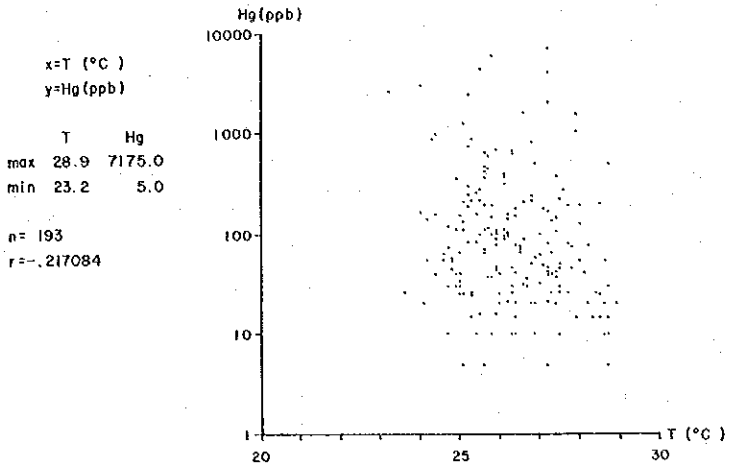


Fig. Ⅲ-2-15 Relationship Between Hg in Soil and Temperature

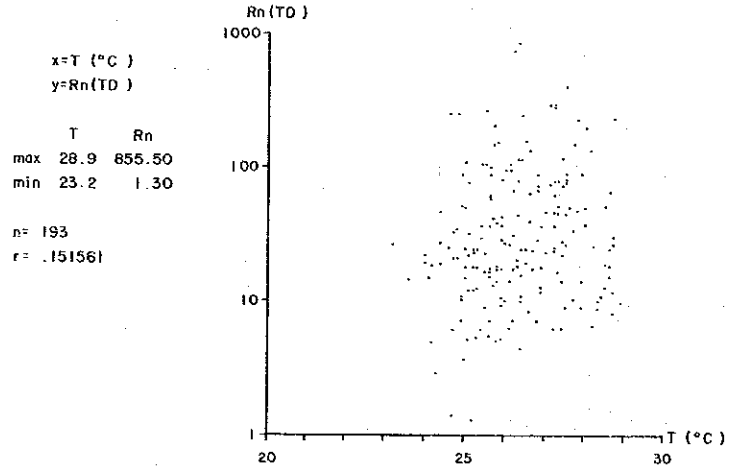


Fig. Ⅲ-2-16 Relationship Between Rn in Soil Air and Temperature

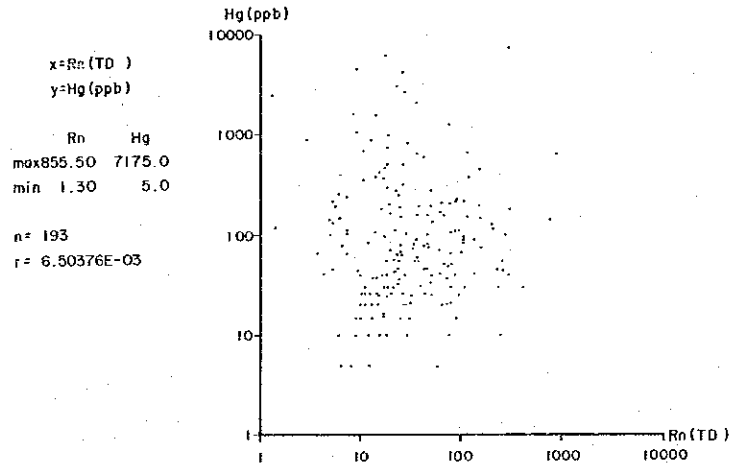


Fig. Ⅲ-2-17 Relationship Between Hg in Soil and Rn in Soil Air