LETTERS TO THE EDITOR

Report of Observations of Geomagnetic Variations at Aso and Naze (Amami-Oshima), during the Solar Eclipse of June 20th, 1955

(Received Jan. 17, 1956)

1. General Description

An attempt was made to examine precisely the variation of the terrestrial magnetic field influenced outside the total solar eclipse, on June 20th, 1955. For this purpose, we constructed a temporary station at Naze, to add the Aso Magnetic Observatory.

The conditions of the eclipse were as follows:

Beginning of eclipse;	12 ^h 30 ^m	135°E.M.T.	12 ^h 20 ^m	135°E.M.T.
Maximum of eclipse;	13 30	"	13 30	"
End of eclipse;	14 30	"	14 40	"
Degree of eclipse;	35%		50%	

2. Special Remark on Amami-Oshima Temporary Observatory

a) Variometer room.

Situation; The Naze Meteorological Station

Lat. 28°22'.1 N

Long. 129°30'.0 E

The magnetograph room was a concrete structure, and its dimension was 8 meter long, 5 meter wide and 4 meter high.

Daily variation of the room-temperature was about 1°C. Then Z value was corrected the temperature effect. Recording drum runs 20.5 mm. per hour. Fig. 1 shows the position of the room and the arrangement of the instruments.

b) Absolute measurements were made at 3 stations. They were

1. Oshima High School

Lat. 28°22'18" N; Long. 129°30'07" E

2. Oshima Business High School

Lat. 28°22'07" N; Long. 129°30'03" E

3. Sedome Church

Lat. 28°25'13" N; Long. 129°35'41" E

Fig. 2. shows each position of observations. The time of the observations was

The Oshima High School; June 19th

The Oshima Business High School; June 17th-18th, 20th and 25th

The Sedome Church; June 23th

Fig. 1. Magnetograph room

Fig. 2. The positions of observations.

A: The Naze Meteorological Station.

B: The Oshima High School.

C: The Oshima Business High School.

For determining the base value of each component, the result of the absolute measurements at the Oshima Business High School was referred to.

c) The sensibility of the instruments.

The sensibility of the instruments was measured by means of an attached Helmholtz coil, and its values are as follows:

	Sensibility	Temperature Coefficient
Declination D	0.43/mm	0
Horizontal intensity H	$0.75-1.42r$ /mm	0
Vertical intensity Z	5.17r/mm	$4^\circ.5/C$

Sensibility of the D and Z variometers was constant throughout the whole duration. But that of H was a function of scale value as given by the following expression which was deduced through the special experiment on June 26 by the same settlement:

$$H_n = H_0 + \int_0^n a(n) dn$$

$$a(n) = 1.8 \times \{0.418 + 0.0038n + 0.0004(n_s - 50)\} r/\text{mm}$$

where

H_n ; H -value when the scale is n ,

H_0 ; base value,

n_s, n ; reading of scale value in mm,

and n_s is adopted when n is larger than 50 mm.

3. Magnetograph Values on June 20th, 1955

Date	Time h m	H		D		Z	
		ASO 31700 γ +...	NAZE 34225 γ +...	ASO W5°00'+...	NAZE W3°49'.8+...	ASO 34500 γ +...	NAZE 28700 γ +...
20	00 00	90 γ	93 γ	6.6'	8.0'	75 γ	58 γ
	15	88	89	6.8	8.1	75	59
	30	85	85	6.7	8.0	75	59
	45	85	86	6.8	8.0	75	58
	01 00	86	88	6.7	8.0	75	58
	15	88	90	6.8	8.0	76	59
	30	87	89	6.8	8.1	75	60
	45	84	87	6.7	8.1	75	60
	02 00	84	86	6.6	7.9	74	59
	15	84	86	6.7	8.0	75	59
	30	84	85	6.6	8.0	75	59
	45	84	84	6.6	7.9	75	59
	03 00	84	84	6.6	7.8	76	59
	15	85	84	6.6	7.9	77	59
	30	84	84	6.5	7.8	77	59
	45	84	83	6.5	7.8	77	59
	04 00	83	83	6.4	7.7	77	58
	15	84	83	6.4	7.7	77	61
	30	83	81	6.4	7.7	77	60
	45	83	81	6.2	7.6	78	59
	05 00	83	81	6.0	7.5	78	57
	15	83	80	5.8	7.3	79	57
	30	84	81	5.5	7.0	81	56
	45	85	81	4.9	6.6	81	55
	06 00	85	81	4.6	6.3	81	55
	15	84	81	4.2	6.0	80	55
	30	84	80	3.9	5.7	79	55
	45	83	80	3.5	5.4	78	55
	07 00	85	82	2.6	4.6	78	50
	15	84	82	2.6	4.5	77	50
	30	84	83	2.7	4.4	75	48
	45	82	82	3.0	4.5	72	47
	08 00	81	82	3.2	4.5	71	45
	15	80	81	3.5	4.6	67	42
	30	81	80	4.0	4.9	66	41
	45	82	81	4.2	5.1	65	39
	09 00	82	82	4.5	5.6	63	41
	15	82	82	4.7	6.0	60	42
	30	83	84	4.7	6.1	60	41
	45	80	84	5.1	6.6	58	41
	10 00	80	87	5.5	7.0	58	41
	15	80	90	5.9	7.3	57	40
	30	84	95	6.4	7.8	56	39
	45	86	99	6.5	8.1	57	39

Date	Time h m	H		D		Z	
		ASO 31700 γ +...	NAZE 34225 γ +...	ASO W5°00'+...	NAZE W3°49'.8+...	ASO 34500 γ +...	NAZE 28700 γ +...
	11 00	87 γ	101 γ	7.2'	8.9'	55 γ	39 γ
	15	89	103	7.9	9.4	54	39
	30	94	106	8.1	9.4	54	41
	45	95	105	8.6	9.8	54	43
	12 00	98	106	8.6	9.9	55	45
	15	99	106	8.6	10.0	55	45
	30	98	106	8.7	10.2	57	47
	45	98	107	8.7	10.1	56	47
	13 00	96	108	8.6	10.0	55	47
	15	97	109	8.6	9.8	54	46
	30	97	111	8.6	9.6	54	45
	45	101	116	8.5	9.5	54	45
	14 00	102	118	8.3	9.5	54	47
	15	101	117	8.4	9.6	54	48
	30	103	117	8.5	9.5	55	49
	45	102	114	8.4	9.5	56	50
	15 00	100	111	8.1	9.4	58	50
	15	97	110	8.1	9.3	58	50
	30	98	108	8.1	9.3	59	50
	45	97	107	7.9	9.1	60	49
	16 00	95	104	7.7	8.9	62	48
	15	95	104	7.5	8.8	64	48
	30	95	102	7.4	8.7	65	50
	45	93	100	7.2	8.5	67	51
	17 00	93	99	6.8	8.3	69	47
	15	90	97	6.7	8.2	70	51
	30	90	96	6.4	8.3	72	50
	45	90	98	6.3	8.3	72	52
	18 00	92	98	6.0	7.6	74	54
	15	91	100	5.9	7.4	74	54
	30	91	99	5.8	7.3	74	55
	45	93	101	5.8	7.3	73	55
	19 00	94	102	5.9	7.4	72	57
	15	96	103	5.9	7.4	72	57
	30	99	108	6.0	7.3	74	56
	45	97	106	5.9	7.0	73	56
	20 00	97	105	6.1	7.5	73	56
	15	97	107	6.4	7.6	74	56
	30	98	106	6.4	7.7	75	56
	45	98	106	6.4	7.8	75	56
	21 00	96	104	6.8	8.0	75	57
	15	101	107	6.8	8.0	75	57
	30	103	111	6.8	8.0	75	58
	45	103	112	6.7	8.0	75	59

Date	Time h m	H		D		Z	
		ASO	NAZE	ASO	NAZE	ASO	NAZE
		31700 γ +...	34225 γ +...	W5°00'+...	W3°49'.8+...	34500 γ +...	28700 γ +...
	22 00	105 γ	114 γ	6.7'	8.0'	74 γ	60 γ
	15	106	116	6.7	7.8	74	59
	30	106	115	6.7	7.8	74	59
	45	104	115	6.8	8.0	74	57
	23 00	106	116	6.8	8.0	74	59
	15	104	113	6.8	8.1	75	59
	30	103	113	6.9	8.1	74	59
	45	104	114	6.6	7.9	76	59

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