

## 46. Changes in Magnetic Dip that Accompanied the Activities of Volcano Mihara.

(The second report)

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As has been reported in his previous paper<sup>1)</sup>, the writer conducted a series of geomagnetic dip survey over Ooshima (Oo-sima) Island in connexion with last year's eruption of Volcano Mihara and found out remarkable changes in the earth's magnetic field. Though Volcano Mihara has been quiet for several months after the sudden stop of its eruption on Sept. 23, 1950, a new activity took place in the beginning of February this year. The activity continued up to the beginning of May, though the eruption tended to become intermittent towards the end of the activity. Of course, a considerable amount of new lava welled up during the period, the lava overflowing the central cone as before and filling up the interior of the first and second somma.

In order to investigate the geomagnetic state of the volcano, the writer and his associates executed the third survey during the period from March 28 to April 1 with the same instrument which was used in previous surveys.

The results are shown in Table I. Diurnal variation and general changes in the earth's magnetic field are eliminated by means of the same method as used in the previous paper where Kakioka Magnetic Observatory is taken as the standard point. Thus  $\delta\theta$  in Table I may be regarded as the local anomalous changes in Ooshima Island during the period from surveys II to III. Unfortunately, however, many stations in the vicinity of the crater has been covered by the new lava-flow, making it impossible for the writer to reoccupy them. As shown in the Table, changes in dip-angle are generally small except at the station No. 12 where the change amounts to  $-52.7$  minutes of arc. The station, however, was surrounded by a new lava-flow which already cooled down to some extent. Since the point nearest the new lava was only 2 m, the change should be attributed to the intense magnetization of the lava and be excluded from the discussion of general aspects.

1) T. RIKITAKE, *Bull. Earthq. Res. Inst.*, **29** (1951), 161.

Table I.

| No. of Station | Survey III |         | $\theta_{III} - \theta_{II}$ | $\theta_{L, III} - \theta_{L, II}$ | $\delta\theta$ |       |
|----------------|------------|---------|------------------------------|------------------------------------|----------------|-------|
|                | Date       | Dip     |                              |                                    |                |       |
|                | 1951       |         |                              |                                    |                |       |
| 1              | Mar. 31st  | 09h 59m | 48°40'.9                     | -2'.0                              | -1'.7          | -0'.3 |
| 2              |            | 09 18   | 49 32 .1                     | -1.1                               | -1.8           | +0.7  |
| 3              |            | 08 33   | 48 18 .4                     | -3.7                               | -1.4           | -2.3  |
| 4              | 29th       | 17 48   | 51 16 .4                     | -2.2                               | +0.4           | -2.6  |
| 5              |            |         |                              |                                    |                |       |
| 6              |            |         |                              |                                    |                |       |
| 7              | 30th       | 14 23   | 53 30 .4                     | -3.8                               | -1.6           | -2.2  |
| 8              |            |         |                              |                                    |                |       |
| 9              |            |         |                              |                                    |                |       |
| 10             | 29th       | 18 31   | 52 37 .1                     | -3.0                               | +1.0           | -4.0  |
| 11             |            |         |                              |                                    |                |       |
| 12             | 30th       | 15 05   | 48 56 .0                     | -54.3                              | -1.6           | -52.7 |
| 13             |            | 16 04   | 48 40 .3                     | -0.5                               | -1.4           | +0.9  |
| 14             | 31st       | 13 19   | 48 23 .8                     | -0.6                               | -1.5           | +0.9  |
| 14'            |            | 13 40   | 50 16 .1                     | -2.3                               | -1.5           | -0.8  |
| 15             |            | 14 50   | 51 05 .1                     | -2.8                               | -1.5           | -1.3  |
| 16             |            | 15 43   | 48 36 0                      | -1.1                               | -1.5           | +0.4  |
| 17             |            | 11 15   | 43 42 .9                     | +0.1                               | -1.7           | +1.8  |
| 18             |            |         |                              |                                    |                |       |
| 19             | 29th       | 15 49   | 48 08 .8                     | -1.9                               | -2.5           | +0.6  |
| 20             |            | 14 29   | 49 45 .6                     | -0.9                               | -3.4           | +2.5  |
| 21             |            | 13 19   | 48 40 .5                     | -4.4                               | -4.2           | -0.2  |
| 22             |            | 11 13   | 47 40 .5                     | -1.8                               | -3.9           | +2.1  |
| 23             |            | 11 59   | 49 57 .1                     | -3.2                               | -4.7           | +1.5  |
| 24             | 28th       | 10 09   | 47 25 .4                     | -3.2                               | -3.1           | -0.1  |
| 25             | Apr. 1st   | 11 11   | 47 27 .6                     | -2.7                               | -1.1           | -1.6  |
| 26             |            | 12 14   | 46 57 .5                     | -2.0                               | -0.9           | -1.1  |
| 27             |            | 13 20   | 47 59 .0                     | +1.7                               | -1.3           | +3.0  |
| 28             |            | 15 24   | 48 18 .9                     | -3.6                               | -1.4           | -2.2  |
| 29             |            |         |                              |                                    |                |       |
| 30             | Mar. 30th  | 13 18   | 52 47 .5                     | -1.5                               | -2.1           | +0.6  |
| 31             |            |         |                              |                                    |                |       |
| 32             |            |         |                              |                                    |                |       |
| 33             |            | 11 17   | 51 23 .9                     | -3.3                               | -1.9           | -2.4  |
| 34             |            | 10 15   | 50 37 .5                     | -6.1                               | -1.5           | -4.6  |
| 35             | 29th       | 10 30   | 46 41 .8                     | -1.8                               | -3.2           | +1.4  |
| 36             |            |         |                              |                                    |                |       |

Though the changes at the station along the coast are small and scattered, we see a systematic decrease in dip-angle near the central part of the island as shown in Fig. 1, the maximum decrease amounting to 4.6 *minutes* of arc.

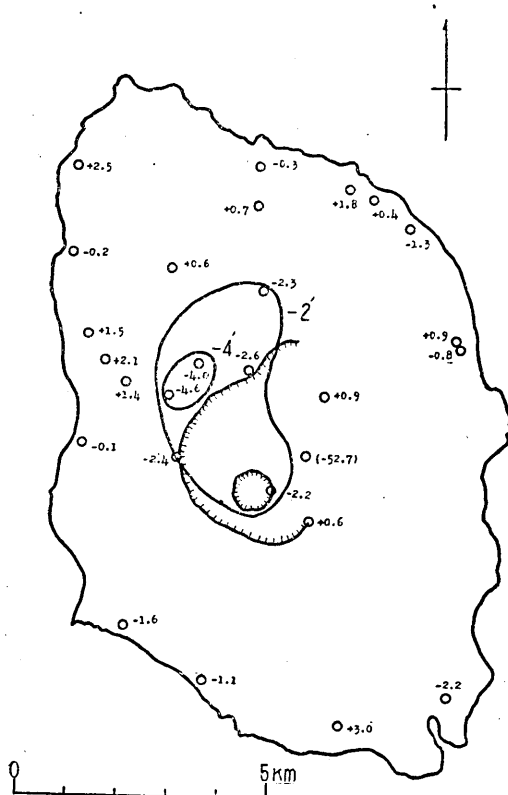


Fig. 1. Changes in dip-angle during the surveys II and III.

Taking into account the accuracy of measurement, we may say that a slight decrease in magnetic dip occurred in the central part of the island during the period from September, 1950 to April, 1951. On the other hand, we found out remarkable decreases in dip-angle during the period from July to September of 1950, the maximum decrease amounting to as much as 30 *minutes* of arc. Since the changes of III-II resemble those of II-I in their modes, we presume that some changes that occurred in the volcano at the early period of the activity have been maintained up to now and slightly enlarged. If we are allowed to ascribe the decreases in the dip-angle to the loss of rock-magnetism due to temperature-rise in the volcano, we may

say that such a high temperature is still kept up in the interior of Volcano Mihara.

In conclusion, the writer wishes to express his hearty thanks to Professor H. Tsuya and Dr. T. Nagata for their encouragement in the course of this study. To Dr. S. Imamiti and Mr. M. Hirayama of the Kakioka Magnetic Observatory who placed magnetic data at the writer's disposal, the writer's cordial thanks are also due. The writer also wishes to express his appreciations to Mr. S. Saito and Miss Y. Hishiyama who assisted the writer in the field-measurement.

46. 三原火山の活動に伴う地磁氣變化 (第2報)

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1951年3月28日より4月1日の期間に、伊豆大島の第三回地磁氣伏角測量を實施した。昨年9月の測量と比較して島の中央部に於て、最大4.6に達する減少が見出されたが、前報告に述べた變化に比べればいぢるしく小さい。この結果より、火山内部の熱的狀態は昨年9月當時と大差ないと推定される。

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