22. *The 1950-1951 Eruptions of Mt. Mihara, Oshima Volcano, Seven Izu Islands, Japan. Part II. The 1951 eruption.*

A. Activity of the second period.

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VI. Temporary suspension of eruption of Mihara crater during Sept. 24, 1950—Feb. 3, 1951.

Mihara crater on the central cone (Miharayama) of Oshima volcano was active for 70 days from July to Sept. 23, 1950, without any day-long or longer break of eruption[28]. By the eruption, the crater and its central pit were filled with new lava; part of the lava ran over the crater-rim both to the north and to the northwest, flowing down to the foot of the central cone; and a cinder cone, about 50 m in height above the crater-floor, was formed outside of the former central pit and near the southern wall of the crater.

The sudden stoppage of eruption on Sept. 23, 1950, marked the end of the 1950 eruption—the first period of the present activity of the volcano. From that day on, the crater had been virtually dormant for 130 days until Feb. 4, 1951, when it began to show again signs of reopening eruption. Thus during that dormant period, there occurred neither eruptive activity nor any remarkable topographical changes in and about the crater, although both the cinder cone and the lava in the crater seemed to have subsided but slightly, though having collapsed here and there, probably due to the withdrawal of some underlying molten lava and/or shrinkage of the solidifying mass of new ejecta (Figs. 62, 63). Some fume or misty vapour was occasionally visible rising through several fissures in the cinder cone, and about the middle of October there remained still visible glow from cracks in the lava at

28) H. TSUYA, R. MORIMOTO and J. OSSAKA, "The 1950-1951 Eruptions of Mt. Mihara, Oshima Volcano, Seven Izu Islands, Japan. Part I. The 1950 eruption," *Bull. Earthq. Res. Inst.*, **32** (1954), 35-66.

a few spots near Kakôjaya (tea-house on the crater-rim). On Jan. 10, 1951, according to S. Watanabe, a photographer of Motomura village, the cinder cone was found to have been cut by several large fissures at the summit and on measuring was found to have depressed more than 1 m. White vapours were issuing, continually and vigorously, through some of the fissures and from the summit bowl-shaped depression (1950 explosive vent) of the cone. However, the general feature of Mihara crater at that time remained nearly the same as that observed immediately after the 1950 eruption stopped.

During the remainder of January and in the first three days of February, the crater maintained again its quiescence as before, displaying nothing worth special mentioning, although steaming of the cinder cone was rather continuous with the rise and fall of its intensity. Neither volcanic earthquakes nor tremors were recorded on the seismographs at the Oshima Meteorological Observatory[29]. Thus there had been no forewarning of the coming danger, even within a few hours just before the 1951 eruption began on Feb. 4.

From Feb. 4 on, the volcano had been in a state of eruptive activity for 148 days, until June 28, 1951, when it finished once again its apparent surface activity. The first half (Feb. 4–April 1) of this activity was an almost continuous eruption attaining its height towards the end of March, while the next half (April 2–June 28) was characterized by recurrence of rather short-lived eruptions with intervening quiet phases. Preceded by the 1950 eruption as the first period and rising phase of the 1950–1951 activity, the former represented the second period and the peak of the activity, and the latter, the third period and declining phase.

VII. Course of the eruption in the second period.

(1) *Opening of the 1951 eruption, Feb. 4, 1951:*

On Feb. 4, 1951, the cinder cone in Mihara crater was steaming all day as usual, not only from its summit crater but from fissures in its outer slopes. Thus white vapour was rising most actively from three radial fissures that ran through the western slope of the cinder cone all the way up to the point where they joined some concentric steaming fissures on its summit crater-rim. Two of the radial fissures, lying about 20 m apart, were trending northwest toward the base of the

29) Y. KIZAWA, "Volcanic tremor," *Jour. Geogr.*, **60** (1951), 28.

cinder cone (Fig. 67).

At about 12 h 40 m, Feb. 4, 1951, following small explosions with a little black ash-cloud, red-hot lava began to be ejected from a vent (a), about 1 m in diameter, newly opened on one of fissures in the 1950 lava adjoining the northwest base of the cinder cone (Figs. 64, 65). Ejection of fragmentary red-hot lava, up to a height of about 100 m in the air, was repeated every two to three minutes, continuing at each time for several minutes, accompanied with loud detonation. The solidified 1950 lava, adjacent to the new vent, was moving up and down, probably owing to pressure of the gases rising from below to be discharged explosively through the vent. At the same time, continuous rocking of the ground was felt distinctly at a distance of about 100 m from the vent, on the crest of western rim of Mihara crater. The vent (a) had stopped its activity within 24 hours without forming any large heap of cinder and/or spattery ejecta around it, although the activity opened the way for more spectacular ones at several adjoining vents, which followed in succession soon afterwards.

(2) *Activity of spatter cones at the western foot of the cinder cone, Feb. 5–19:*

Early in the morning of Feb. 5, adjoining to the south of vent (a), a new vent (b in Fig. 67) was opened to eject red-hot lava in the same way as displayed at the preceding vent. The same day, at about 16 h, a similar ejection of red-hot lava started at another new vent (c in Fig. 67) situated several meters away to the southeast of the vent (b). From that time on, these two vents (b and c) were almost continually active side by side, but without any sympathetic rise and fall of their activities. On Feb. 6, at 15 h, the vent (b) was found to have grown into a spatter cone, about 5 m in relative height, while the vent (c) still remained as it was in the preceding day, without being surrounded by conical heap of spattery ejecta. With an intermission of less than one minute, a detonation lasting for 4 to 5 minutes was being repeated, and at the same time fragments of red-hot lava were being thrown up to a height of about 30 m in the air.

On Feb. 7, at 10 h 30 m, two active vents (b and c) were displaying ejection of red-hot lava as before, and sending forth white vapours in addition. A hissing noise like that caused by a flying cannon-ball was heard almost continuously, but with a short intermission at intervals of 4 to 5 minutes. Besides, about that time, considerable white

vapours were visible rising along several cracks in the 1950 lava about the active vents, and also at a few sunken areas south and southeast, on the western foot of the main cinder cone (Figs. 66, 68).

On Feb. 9, at 10 h 50 m, one of the active vents (c) was found to have grown into a spatter cone, about 5 m in relative height, and was ejecting lava spatter side by side with the other vent (b). Emission of a bluish fume was being accompanied with an almost continuous hissing noise. But they became feeble or stopped while the lava spattering was going on. Two days later, explosions were heard, together with puffs, almost continuously from early morning to evening hours and with increasing intensity, even at Goshinka-jaya (tea-house) on the somma. The spatter heaps at b and c had extended largely so that their skirts joined with each other. One vent (c), a few meters in diameter, was ejecting lava fragments from two spots in it, to a height of more than 100 m in the air, while the other (b) was at a standstill, but glowing inside. The neighbouring sunken areas that had been steaming vigorously for the preceding few days were visible without sending forth vapour clouds so thick as to veil themselves. One of them, situated about 100 m south of the vent (c), was circular in its outline with a diameter of about 50 m, standing out clear with white and yellowish patches of incrustation due to some solfataric action, and having a glowing spot in its central part. Between the said area and the vent (c), and adjacent to the west foot of the main cinder cone, there was another sunken area wherein a little red-hot lava was exposed.

On Feb. 13, about 13 h, red-hot lava began to gush from a new vent (d in Fig. 69) in one of the above-mentioned sunken areas, and about an hour later, the lava was flowing northwards along the western wall of the Mihara crater, after having spread over the area about the new vent. In the vent was a red-hot lava pool, about 20 m in diameter, surging incessantly and displaying explosive fountainings at intervals of several minutes, by which spattery lava fragments were thrown up to a height of about 100 m in the air. About that time, the vents (b) and (c) continued to be active in building their respective cones with spattery ejecta, and the sunken area southeast of the vent (c) seemed to have a red-hot lava pool, about 30 m in diameter.

Lava outflowing from the vent (d) had already stopped early in the next morning, whereas explosive lava fountainings at the same vent lasted for several days. Thus on Feb. 15, at 11 h, the fountaining

activity was in progress at the vent (d), which had been surrounded with its own-building spatter cone, about 10 m in height and 40 m in diameter at the base. The neighbouring vents (b) and (c) also continued to spatter red-hot lava, although their activities were far less in intensity than that at the vent (d). The spatter cones at (b) and (c) were measured respectively 8 m and 11 m high, and 35 m across at their combined basal part. In the sunken area southeast of the vent (c), there were two glowing spots, and faint bluish fume was rising from the ground thereabout. Soon after these two glowing spots became active in succession, forming separate vents (e and f in Figs. 70, 71) that displayed lava spatterings side by side. Thus on Feb. 17, at 12 h 30 m, these two vents continued to spatter red-hot lava, each being surrounded with its own spatter cone, about 5 m in height. At that time the neighbouring three vents (b, c and d) were also actively piling their spattery ejecta higher and higher around them.

For the next two days, Feb. 18–19, the five vents (b, c, d, e and f) were active, every one of them, vying with one another in making flings of spattery red-hot lava, together with detonations accompanied by puffs of blue gas. The lava spatterings and detonations were going on almost continuously at b and e, while they occurred about every two minutes at d and f. On Feb. 19, at 10 h 30 m, the spatter cones b—f measured 20 m, 20 m, 30 m, 10 m and 8 m in height respectively, and the lava spatterings that were still going on, were some 50 m, 30 m, 150 m, 100 m and 20 m in height above their respective vents. With the simultaneous lava spatterings on that day as a climax, these vents declined in activity rapidly afterwards. Thus on Feb. 21, at 11 h, three (c, d and f) of the five vents were found to have already stopped their lava spattering activity, although the rest (b and e) still remained active with some lava spatterings continuing until the beginning of the next month.

(3) *Revival of eruption of the 1950 cinder cone, Feb. 20, 1951:*

While the lava spattering activity was spreading among the six vents (a—f) as mentioned above, both fissuring accompanied by local collapse and emission of whitish vapour-clouds on the 1950 cinder cone were being increased remarkably. In the afternoon of Feb. 6, S. Watanabe went to the summit of the cone on the southern rim of its crater-bowl; no further sign of activity of the crater could be detected, except voluminous liberation of whitish vapours, although the cone was still very hot only a few centimeters beneath its surface, even on its

outer slope, and there were several fissures glowing inside. There was steam on the outer slopes of the cone and inner walls of its crater-bowl, and lines of vapour vents could be followed all way up the western slope, which might represent upright fissures in the cone. There were also several steam lines parallel with the rim of the crater, which marked concentric fissures in the cone (Figs. 65, 67).

The steaming activity of the cone increased in intensity day by day, but there was sometimes apparent lull in the activity as on Feb. 9, when only a faint blue fume could be seen rising on the cone.

On Feb. 9, the cone was found to have settled remarkably in its western sector between two steaming fissures extending from near the crater-rim half way down the outer slope. Within sunken area and half way down the western slope of the cone, there had developed a bowl-shaped opening, about 30 m in diameter, whence steam could be seen rising in quantity on Feb. 13. This new opening on the cone had gradually been enlarged and deepened by slumping of its walls and possibly by steam blasts. On Feb. 17, it had grown into a crateriform depression vomiting whitish vapour-clouds (Fig. 70).

A new feature on the cinder cone, as observed on Feb. 20, was a black ash-cloud rising from an explosive vent, a few meters in diameter, that newly opened on that day close to the down-slope side of the above-mentioned depression on the western slope of the cone (vent 1, Fig. 73). The next day, bombs of red-hot lava was being ejected in succession from the new vent, together with black ash-clouds. This was the first time after the early days in the second period of activity that the ejection of red-hot lava had come into play from a vent on the 1950 cone.

On Feb. 23, at 15 h 30 m, heavy volumes of black ash-clouds were rising from the Feb. 20 vent, while red-hot bombs were being ejected from another new vent (vent 2, Fig. 73), several meters in diameter, that had been opened close to the downhill side of the preceding one. At the same time the first depression on the northwest side of the top of the cone had grown into a new crater. Thus having been enlarged and deepened markedly since the beginning of collapse about Feb. 11, it took the form of a circular crater several scores of meters across, with its southeast rim close to the northwest rim of the 1950 crater of the cone (vent 3, Fig. 73). Vapour clouds were rising from both old and new craters. It was evident that the new crater was being extended by fissuring and slumping of loose ejecta on the surrounding walls.

a

b

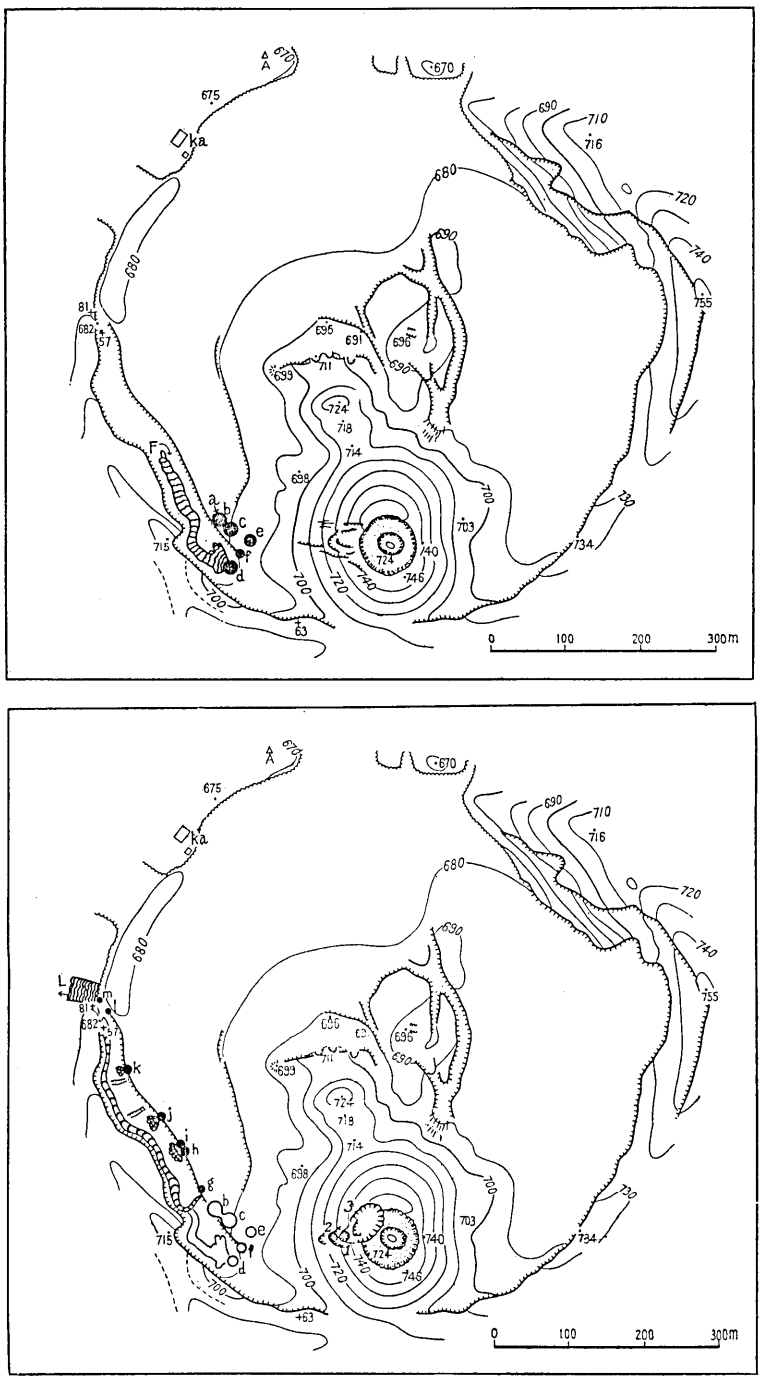

Fig. 72. Map of Mihara crater.

a) Showing new spatter cones (b—f).

b) Showing new spatter cones (g—l) and new vents (1—3) on the main cinder cone.

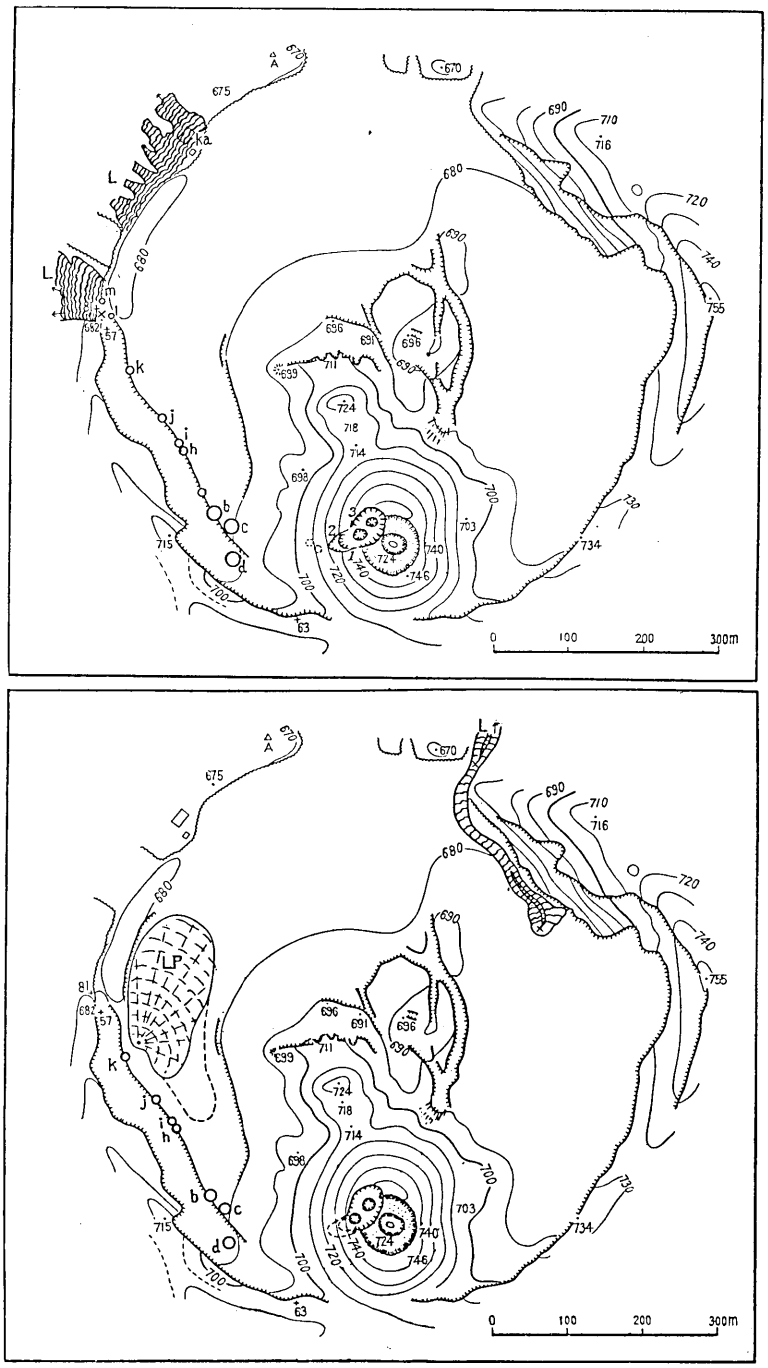

Fig. 73. Map of Mihara crater.
Showing development of new vents on the main cinder cone.

The next day, between 13 h and 16 h 40 m, explosive eruption was taking place at the Feb. 23 vent every one or two minutes, with ejection of red-hot bombs and occasional spoutings of black ash clouds. For the most part of the rest of February, an almost incessant activity of the cinder cone was notified by explosions so loud as to be audible every several minutes even at the village of Motomura, but it was visible only at times from Goshinkajaya because of cloudy weather with occasional rains.

(*4*) *Appearance of a line of new spatter cones, and upheaval of the inside of Mihara crater, late in February, 1951:*

Since the beginning of the present activity on Feb. 4, 1951, the inside of Mihara crater had been rising little by little, but with some intervening small halt and subsidence, as confirmed by observing several landmarks both on the top of the 1950 cinder cone and on the 1950 lava-flows accumulated within the crater. The rising was remarkable particularly in the northwestern half of the crater including the central mound that had been thrusted out of the former central pit during the 1950 eruptions. Thus the central mound and the vicinity were observed to have upheaved 5–6 meters by the end of February. Besides, on Feb. 23, the lava ground northwest of the 1950 cinder cone was found to have upheaved several meters in a night, covering an area of about 150 m × 50 m in front of the west wall of Mihara crater.

On the just-mentioned lava ground, prior to its remarkable upheaval, a faint blue fume was seen already about Feb. 17, rising from a small area, about 1 m in diameter, with whitish and yellowish coatings. Since then, the fuming area had been spreading day by day until Feb. 23 when, immediately after the sudden upheaval of the lava ground, blue fumes were rising with hissing noises from many spots on the upheaved ground. By that time this ground was traversed by several large cracks opened deep due to its upheaval, and moreover its surface part was broken into countless lava pieces, large and small, to form an impassable chaotic mass. Blue fume was rising most vigorously from several spots on one of the large cracks, which run from near the aforementioned group of spatter cones northwestward for a distance of about 500 m. And at last, about Feb. 25, red-hot lava began to be thrown out as spattery ejecta from a fuming spot near the southeastern end of that crack, and a new spatter cone, several meters in height, was formed at the spot a short time later. From then onward lava ejection

spread rapidly all along the same crack, and on March 2 there developed six new spatter cones forming a line along the crack (g, h, i, j, k and l in Fig. 72 b).

(5) *Lava overflowing onto the western flank of Mt. Mihara, Feb. 28, 1951:*

The proceeding of the activity of Mihara crater in February suggests that, after travelling a long way upward through the permanent lava-conduit underneath the volcano, a molten lava again came up to the crater bottom, intruding in sequence into different parts of the crater filling. Thus the molten lava approached the ground in succession: first in a small area including the spatter cones (b)—(f); second on the western flank of the cinder cone; and third in the northwestern part of the crater, particularly along a fissure by the SE.-NW. line of spatter cones (g)—(l). As the activity continued, the inside of the crater was subject to a differential upheaval, suggesting that intrusions were going on within the heap of ejecta filling the crater, forcibly but with different rates of progress in different parts of the crater. The molten lava which intruded must have had an unconquerable gas potential actuating it, and consequently, upon approaching the surface of the ground, it caused an explosive liberation of gases, resulting in eruptions of red-hot lava breaking through different parts of the ground as already described. But, for three weeks after the present activity began on Feb. 4, 1951, the eruptions were no more than almost incessant spatterings of red-hot lava accompanied by occasional puffings of black ash-clouds, with the exception of a small lava-flow brought by the fountaining activity at the vent (d) on Feb. 13.

It was on Feb. 28 that the 1951 lava overflowed for the first time the northwestern rim of Mihara crater and descended the western flank of Mt. Mihara onto the sandy flat called Sabaku (desert)—part of the atrio between the somma and the central cone (Mt. Mihara). Thus, according to I. Takagi, a member of the family who manages the Goshinkajaya rest house, this day about 1 h, a red-hot lava was observed from his house, descending the western steep slope of Mt. Mihara in a cascade of fire along the margin of the southernmost of the 1950 lava-flows. The same day, at 11 h, the new lava was found to have reached the flat of Sabaku, a distance of more than 1 km from its source, forming a narrow stream, a few meters in width, on the steep slope of Mt. Mihara, and spreading out as a broader fan over the flat of Sabaku.

The lava front, which showed the form of a levee about 1.3 m high, was still creeping ahead sluggishly with a rattling noise made by *aa* blocks tumbling down from the front as it advanced.

The lava did not come directly as a surface flow neither from the 1950 cinder cone nor from any one of the spatter cones on the floor of Mihara crater, but it issued from a new vent opened in the pile of 1950 lava on the northwestern rim of the crater, just at the northwestern end of the fissure on which several spatter cones (g—l) were being formed. It must have been fed by a molten lava that moved sideways from the inside of the crater through the said fissure beneath the surface. Possibly about that time, lava stood molten in the fissure at levels high enough to permit spatter ejection on the one hand, and outflowing in a red-hot fluidal state on the other.

For more than a month after its start on Feb. 28, the lava outflowing went on with increasing intensity, and in the latter half of March it showed itself as the climax of the present activity, together with the concurrent Strombolian eruptions on the 1950 cinder cone.

(6) *Climax of the present activity, March, 1951:*

i) Activity of spatter cones: Early in March, lava spatterings were in progress to build up several spatter cones in the line of activity (g—l, Fig. 74) that had developed late in the preceding month along the crack about 500 m long, trending southeast-northwest across the upheaved lava floor in the northwestern part of Mihara crater. Besides the active vents with growing spatter cones, there had developed a number of fuming (or steaming) spots in the same line of activity, where the rock was covered with whitish and yellowish coatings. The spatter cones were very changeable in activity without any sympathetic or antipathetic relation between them. Thus on March 4, of the three spatter cones (i), (j) and (k), all of which towered far above the rest, with a height of 5 m or so, the last one was throwing out spatters of red-hot lava every three minutes to a height of several meters in the air, while the other two were sending out white vapours only without regard to their vents glowing inside; on March 6, the spatter cone (k) displayed neither lava spattering nor steaming, whereas (i) and (j) were in the midst of their lava spatterings side by side, and (j) was spilling small lava-flows from its side openings (Fig. 75). But the line of activity appeared to be most active as a whole on March 7, when lava spatterings were going on side by side on the four spatter cones (i, j,

k and l), besides lava squirtings in the form of a small river of fire from a vent adjacent to (g). The same day, at 20 h, incandescent lava from this vent was seen flowing with a velocity of about 0.5 m/sec, at first to the west for a distance of about 50 m, then to the north for a distance of about 300 m along the western wall of Mihara crater (Fig. 76).

The lava floor on both sides of the just-mentioned line of activity had been upheaved several meters in the few days before March 10, together with the adjoining central upthrusted mound[30]. But after March 11, these parts showed a tendency to depress, and at the same time, lava spatterings and other activities in that line of activity also dwindled rapidly. Thus on March 16, when one of the writers (Tsuya) visited the volcano, lava spatterings were found to have stopped at all the vents in the line of activity but two (h and i), which were ejecting a few blocks of red-hot lava every several minutes; blue fumes were rising from (j) and (k) with loud hissing noises; and only heat was noticeable at (l) and (m). At that time these last two were forming chimney-shaped spiracles a few meters high, surrounded with agglutinated spattery ejecta, while each of the other four vents (h, i, j and k) was atop a beehive cone about 10 m high, built up with agglutinated spattery ejecta and partly covered by small aprons of lava-flows (Figs. 77, 78). The southeasternmost vent (g) seemed to have disappeared in the heap of later ejecta from neighbouring vents. On the other hand, in the older group of vents adjacent to the west of the 1950 cinder cone, the twin spatter cones (b and c) were ejecting only one or two blocks of red-hot lava at a time but spasmodically, and the spatter cone (d), the largest of all, had a crateriform vent at its top, whence a bluish flame of burning gases was rising like a torchlight, with intervening spasmodical ejections of a few red-hot lava blocks. Covered with cinders ejected from the 1950 cone, these older spatter cones were about 30 m in height, whereas the rest in the same group (e and f) had vanished from sight.

ii) Activity of the main cinder cone: The explosive eruption of the 1950 cone, which was resumed in February at two vents on its northwestern side, became more spectacular in the next month. Thus, on March 2, after having been shrouded by thick rainy cloud throughout Feb. 28 and March 1, the cone was seen displaying explosive ejections

30) Cf. Figs. 31 and 61 of our previous paper (H. TSUYA, R. MORIMOTO & J. OSSAKA, *ibid.* p. 44.).

of red-hot lava from the two side vents (Feb. 20 and Feb. 23 vents), at intervals of about thirty seconds and occasionally accompanied with puffings of black ash-cloud. Close to the downslope side of the Feb. 23 vent there had developed two other vents, one inactive and the other issuing steam, whose exact date of birth was quite unknown.

The vents on the northwest side of the cone subsided virtually within the first ten days of March and all activity became centred in the summit depression afterwards, which had become enlarged by the slumping and fissuring of the surrounding walls. Thus, on March 16, the summit depression was found to have become a new crater consisting of two active vents linked with each other. The crater formed a circular funnel, about 80 m in diameter at the upper rim and more than 30 m in depth, encircled with steeply sloping walls on all sides but the west where it opened to the much shallower hollow of one of the formerly active side vents. With a low-pitched detonation, the crater bursted into a spectacular eruption repeatedly : one (west vent) of the two active vents in the crater belched a jet of fire carrying cinders and bombs of red-hot lava, at intervals of four to five seconds; and the other (east vent) sent up puffs of black ash-cloud only at a little longer but irregular intervals (Figs. 79, 80). During a spasm of the eruption red-hot bombs were being thrown into the air up to a height of about 200 m above the top of the cone. Observations from the west rim of Mihara crater, at a point about 300 m west of the centre of activity, showed that most of the flings were getting back into the crater from where they came, and only a few were falling outside the crater and rolling down the slopes of the cone. During the flight through the air, bombs generally followed towering parabolic trajectories, high and low, except those which shot straight upward above the crater (Figs. 81–84). But there were occasionally observed some lava clots taking irregular, wavy paths, and seemingly floating to flutter like burning paper. Larger bombs made a whirring noise by friction with the air while flying through it, and also made a pounding noise as they flopped down on the ground. None of the flings, however, reached to the observation point, because at that time explosions were not forcible enough and the wind was from the southwest, carrying smaller flings (cinders and ashes) to the leeward (northwest) side of the cone. Therefore, nothing dangerous was met during the half-day's stay as that point for observing the eruption, although harmonic tremors of the ground, which were felt just like the roll and pitch of a boat,

were strong enough to cause a little uneasiness to the observers on the scene, together with the larger shocks felt at times but usually in company with the explosions.

The explosive activity of the cinder cone, pulsating in character, continued until about March 25, with little change except the particularly heavy explosions in the afternoon of March 20, which were accompanied with spatterings of lava clots, more than 1 m in diameter, up to the height of about 100 m in the air and at the rate of ten times a minute.

From March 25 on throughout the rest of the month, the cinder cone became less active, the major portion of its activity being explosive puffings of black ash-cloud and continual emission of white vapor-cloud. On March 31, only white vapours were seen rising from the cone, in company with light explosions, at intervals of several seconds. Thus the most thriving activity of the cinder cone seemed to have come to an end by March 25, after continuing for about two weeks from March 10. At the village of Motomura, during this period, explosions were not only heard but also frequently notified by rattlings of doors, casements, etc; spectacular glowing cloud effects over the mountain could be seen occasionally at night, with the glow waxing and waning; and observation from sea in a starlit night showed red-hot bombs being shot up like hundreds of shooting stars.

iii) West lava-flows: The lava outflows on the outside of Mihara crater, which started on Feb. 28, went on rather steadily throughout the next month, but with occasional changes of its source (Fig. 85). On March 2, at 17 h, red-hot, fluidal lava was spurting out of a vent in the solidified lava, situated just inside the northwestern rim of Mihara crater, and it was pouring away in torrents down the mountain slope (Fig. 85). Thus, advancing downwards as well as sidewise, the new flood of lava was being enlarged on the western steep slope of Mt. Mihara (central cone) and the adjoining flat of Sabaku, besides flowing over the older still-moving flows (Fig. 87, 88). On March 6 and 7, lava was issuing not only from a vent in the edge of the already-solidified lava on the northwestern rim of Mihara crater, but also from two or three holes in the fresh flows halfway down the steep outer slope (Figs. 89, 90).

The Mihara Shrine, a stone building a few meters high situated at the western base of Mt. Mihara, was buried underneath the flood of advancing lava on March 9 (Fig. 87, 120). The same day, at 16 h 10 m,

Kakôjaya (tea-house) on the north-northwestern rim of Mihara crater was also destroyed by a new lava-flow whose front by that time was about to run over the crater-rim at the south of the house. On March 10, at 5 h 30 m, this new flow was found to have advanced downhill just north of the 1950 west flow (Nomashi lavas shown in Fig. 30) and partly overlapping it. Thus, by that time, the flow had spread out as a broad fan over the flat sandy terrain (Sabaku) adjacent to the northwest base of Mt. Mihara and only a few hundreds of metre distant from Goshinkajaya (tea-house) on the northwestern caldera-rim; its farthest front had reached a distance of about 1200 m from the rim of Mihara crater, and the front was still moving forward at the rate of 0.5 m per minute. On March 12 the new lava flow on the north side of the 1950 west flow was found to have coalesced with the flow on the south side at their fronts, with several islands of the 1950 flow left uncovered between them.

From then on, during the two weeks to March 25, lava flows continued to pour out of temporary, changeable vents in the older already-solidified lava either on the crater-rim or on the steep outer slope of the mountain, and run downhill either in two or three separate torrents or as braided, branching streams, and spread over the flat ground of Sabaku. One of more thriving and long-lived flows in that period was that which on March 17–18 was seen running down along the south margin of the already-solidified flows on the western slope of the mountain. The main source of the flow was on the northwestern rim of Mihara crater, near the northwestern end of the previously-mentioned line of spatter cones, where brilliant golden-yellow molten lava was welling out continuously and silently from an opening, about 0.5 m in diameter, in the solid crust of an older flow (Fig. 92). After crawling once under the solid crust and passing through a tunnel about 20 m long, the molten lava again welled out of another opening at the lower end of the tunnel to flow downhill in a single stream (Figs. 93, 94). Moreover, in the evening hours of March 17, molten lava was seen gushing out of the side opening (grotto) on a small lava-cone, about 2 m in height and situated on the steep slope at a short distance north of the last-mentioned lava source, and flowing in torrents into the main lava stream in question (Figs. 91, 100). The lava-cone seemed to be a lump of lava which, upon reaching this point as a surface flow or through a tunnel, had been prevented temporarily from further flowing downhill by some obstacles.

Table XII. Temperatures of the 1951 flows.*

Date	Lava temp. (°C)	Locality
March 16	800	Loc. a, on the NW. slope, outside of Mihara crater.
March 21	850	Loc. b, south of the source vent of the west flows, on the NW. crater rim.
〃 〃	1120	Loc. c, in a crack on the lava flow, 130 m SE. of loc. b.
〃 〃	850	Loc. d, south side of one of the west flows on the NW. slope.
〃 〃	850	Loc. e, lateral front of one of the west flows, below the NW. caldera wall, 150 m north of the passage to Nomashi village.
March 22	1000	Loc. f, the farthest front of the west flows, 300 m NE. of Goshinka-jaya.
〃 〃	980	Loc. g, ditto.
〃 〃	1050	Loc. h_1, ditto.
〃 〃	1050	Loc. h_2, ditto.

* Observed by J. Ossaka and others[31], by means of an optical pyrometer. Localities are shown in Fig. 120.

Table XIII. Hourly rates of advance of the lava fronts.*

Date	Rate of advance, m/hr	Locality
March 16	3	Loc. x, the farthest front of the west flows, 95 m E. of the passage to Nomashi village.
March 19	6	Loc. y, immediately below the caldera wall at Goshinka-jaya.
March 22	3	Loc. z, the farthest front of the west flows, 300 m NE. of Goshinka-jaya.
〃 〃	2 (m/day)	Loc. w, lateral front of one of the west flows, 150 m N. of the passage to Nomashi village.

* Observed by J. Ossaka and others[31]. Localities are shown in Fig. 120.

31) In this matter, the writers owe much to Messrs. S. ÔYA, S. HADA, K. ISA, N. OGUSHI, S. SAKURAI, H. OBA, K. ONO, F. KINOSHITA and K. GOTÔ of the Geological Institute of our University.

The just-mentioned flow of glowing lava was running in rather straight stream like a moving belt-conveyor or escalator, with a velocity of about 0.5 m per second on the steep slope (25° or so) near its source. It was about one metre wide, becoming wider farther down the slope and exhibiting a widening into delta shape at the front on the flat ground several hundreds of metre down the slope (Figs. 95–97). At the source the glowing liquid was bright orange in colour, its heat radiation was strong enough to prevent us from approaching within two meters, and its viscosity was such as to allow us to push the tip of a long stick narrowly into it with both hands. The flow became dotted with black patches of solidified crust shortly after its departure from the source vent, and as the flow advanced downhill, these patches increased until at last they covered the whole surface of the flow. The crust thus formed tended to wrinkle into festoons of ropes with convexity downstream, making the flow less rapid and more restrained, with the greatest drag at the stream margins (Figs. 97, 98). Besides, the flow was building up natural levees of dark clinkers at each side, about 1 m high, making the flow more and more high than its surroundings. Upon arriving at the flat ground, the flow changed into a bank of *aa*, 2–3 m high and several meters wide, and as it was pushed from behind, its front was creeping forward at the rate of a few meters per hour, with the behaviour like a moving caterpillar tractor. Thus as the front advanced, its wall was impelled forward to be broken into pieces; as blocks fell off from the frontal wall and lumps of red-hot lava inside fell out on the ground below, with rustling noises; sometimes the front pushed its way through the soft sands on the flat ground, folding the latter into a low, wave-like ridge; and in some places the hardened crust of the flow broke open and gave vents to new lava-tongues which, after emerging as rounded bulbs of newly formed crust, projected ahead and sideways like arms and toes (Figs. 99, 101).

Between Feb. 28 and March 25, the almost continuous outflowing of lava resulted in an enormous volume covering practically the whole of the northwestern slope of Mt. Mihara and the adjoining flat ground of Sabaku (caldera floor), covering not only the greater part of the 1950 west flow but also the much larger surrounding area and several islands left uncovered in it (Figs. 102–104). Thus all the new flows that ran down the northwestern slope united below into one, and spread together westward against the northwestern caldera wall and then northeastward along the base of the wall. On March 17, part of the lateral front of

the flow had reached a point about 50 m distant from the deepest gap in the northwestern caldera wall, the passage to the village of Nomashi, and was advancing very slowly farther towards the gap. Lest they should suffer damage from the flood pouring out through the gap, the villagers tried to prevent by a ditch the further advance in that direction of the flow (Figs. 105–108). Seeing that the artificial ditch thus formed, about 1 m deep and 1.5 m wide, proved to be ineffective, they constructed a stone-wall about 2 m high to block the gap in the caldera wall. But this stone-wall was in reality of no use, because the lava was flowing down the gently-sloping ground northeastwards and along the base of the caldera wall, instead of attaining the level of the stone-wall whose base was several meters higher in level than the surface of the lava flow below. On March 18, the farthest front of the flow reached a point near the caldera wall just below Goshinka-jaya (tea-house), a distance of about 2 km from the rim of Mihara crater, and thereafter it advanced farther northward for about 700 m until it virtually stopped still on March 28 (Figs. 109, 110). During the last few days the lava front was advancing over a bushy land with a danger of setting fire to the surrounding bushes, but the fire was prevented by the villagers who cutdown these bushes.

The new lava flows that covered wholly the northwestern caldera floor thus formed a great lava field, about 2.7 km in length, 700 m in width at the middle, and narrowing into a 20–30 m flow at the northern end (Fig. 111). The thickness of the lava is probably about 8 to 10 m in the central part of the field and less than 1 m in its marginal part. The surface of the lava flows is largely covered with clinker-like blocks of *aa* type, but each flow is massive inside, forming a continuous ledge beneath its own crust of *aa* blocks, as may be seen in many contraction cracks formed during its cooling. Besides, in some places of the lava field, a very rough surface of "shark-skin" type is exposed patchwise without any blanket of clinkers, showing parallel grooves in the direction of flow. Along the margin of the field, particularly at its lower part, there developed a number of short tongues and toes of lava having a relatively smooth surface. But a typical *pahoehoe* is found within a short distance from the source vents on the rim of Mihara crater, where the lava is covered with a thin crust easy to break and contorted into a complex ropy structure.

The general feature of the lava field just outlined shows that the change from *pahoehoe* to *aa* took place shortly after the lava came out

of the vent of outflow, *aa* being characteristic of all the long flows far down the mountain slope. The flows that came out secondarily from cracks or tunnels in their predecessors were not typical *aa* even at their outlets, possibly owing to the fact that they maintained a relatively low temperature at the time of outflow. One of the writers (Ossaka) and students of the Geological Institute observed the lava temperatures with an optical pyrometer at several points of the flows, with the results as shown in Table XII. Hourly rates of advance of the lava fronts, observed by them, are shown in Table XIII.

iv) Lava pool: On the morning of March 25, shortly before the cessation of lava outpourings on the northwestern slope, a temporary lava pool was developed in the source area of the lava flows, just on the east side of the line of spatter cones (g–1 in Fig. 73) in the Mihara crater. The sudden stoppage of continuous drainage of lava-flows down the mountain slope must have caused the pool on their source vents in that part of the crater floor where molten lava was still continuing to issue from some underlying feeders. The lava pool thus formed became a shallow, oval basin, about 250 m in N.-S. diameter and 150 m in E.-W., bordered on its northwestern side with a slump scarp a few meters high, so that the molten lava in the pool could not overflow the northwestern mountain slope (Fig. 112).

The lava pool was glowing brilliantly with a darker scum forming on the surface and was so fluid that it was continually agitated with waves breaking against the shore[32] (Figs. 113, 114). In the pool, near its western shore, a group of lava fountains was in rapid succession welling up a dome (big bubble) of molten lava a few meters high above the pool, then bursting into pieces to be scattered about (Fig. 115 a-h). An ever-changing, glowing cobweb pattern, radial and concentric to the fountain group, was seen with zigzag bright lines between the skins of molten lava, fanning out to the east. Thus the lava streams in the pool flowed outward from the fountain group, and upon reaching the surrounding shore, they flowed under the solid lava on the shore, as if engulfed from within, instead of flowing outside over the slump scarp and other beach ramparts. It seemed likely that a convectional circulation of molten lava was taking place within the pool, although at the same time there was also a possibility of leaking out of the lava down

32) The activity of this lava pool may be clearly seen on the 16 mm telephoto motion pictures (The Eruption of the Volcano Oshima in 1950–51.) taken by the Ministry of Education, Japan.

to the northwestern slope through some passages under the slump scarp on the shore of the pool. The fountain group seemed to be the main source supplying molten lava to the pool, and as far as could be ascertained, it was situated close to the line of the spatter cones (g–1) whose gas activity still asserted itself in continual hissing noises from the glowing vents on the spatter cones (h), (i) and (j). These features seemed rather to favour the supposition that the lava pool was fed through the fountain group from that rift which had given birth to the line of the spatter cones.

Toward the end of March, the lava pool was found to have become smaller and less active. On March 30, it was about 50 m×100 m in area and much crusted, and by the beginning of the next month, it was crusted all over its surface.

v) Northeast lava flows. The eastern half of Mihara crater had displayed nothing particular to be mentioned until the end of March. Thus, for about 55 days from the beginning of the 1951 eruption on Feb. 4, neither lava flow nor spattering occurred on the northeastern floor of Mihara crater, and no eruptive vent was formed on the east side of the 1950 cinder cone. Being filled with the 1950 lava flows and partly covered with new ejecta (ashes and cinders) from the 1950 cone, the crater floor showed pressure ridges and mounds and irregular hardened flow patterns, with chasms and cracks particularly conspicuous near the east side of the central upthrusted mound now occupying the site of the former central pit. There were the usual steaming cracks about the crater floor, white vapours being seen rising vigorously during damp and cool weather. Several lines of vapour vents could be followed up the eastern slope of the 1950 cone, but hardly any spot of red-hot heat was visible thereabouts (Fig. 116).

On March 28, at 16 h 30 h, a river of red-hot lava was seen flowing for the first time in 1951 over the northeastern rim of Mihara crater (Fig. 73 b), running down the northern slope of the central cone, along the east margin of the 1950 northern flow (Senzu lavas shown in Fig. 30), and partly over-lapping it. Upon reaching the gentler slope at the base of the cone, the new lava flow deflected its course northeastward, and advanced about 3 km within a day into the desert land in the northeastern gap of the somma mountain. The flow was of the *aa* type, advancing in the same manner as observed on the already-mentioned west flows. It was about 10 m in width in the upper course, about 400 m in the middle with a long island left uncovered, and became

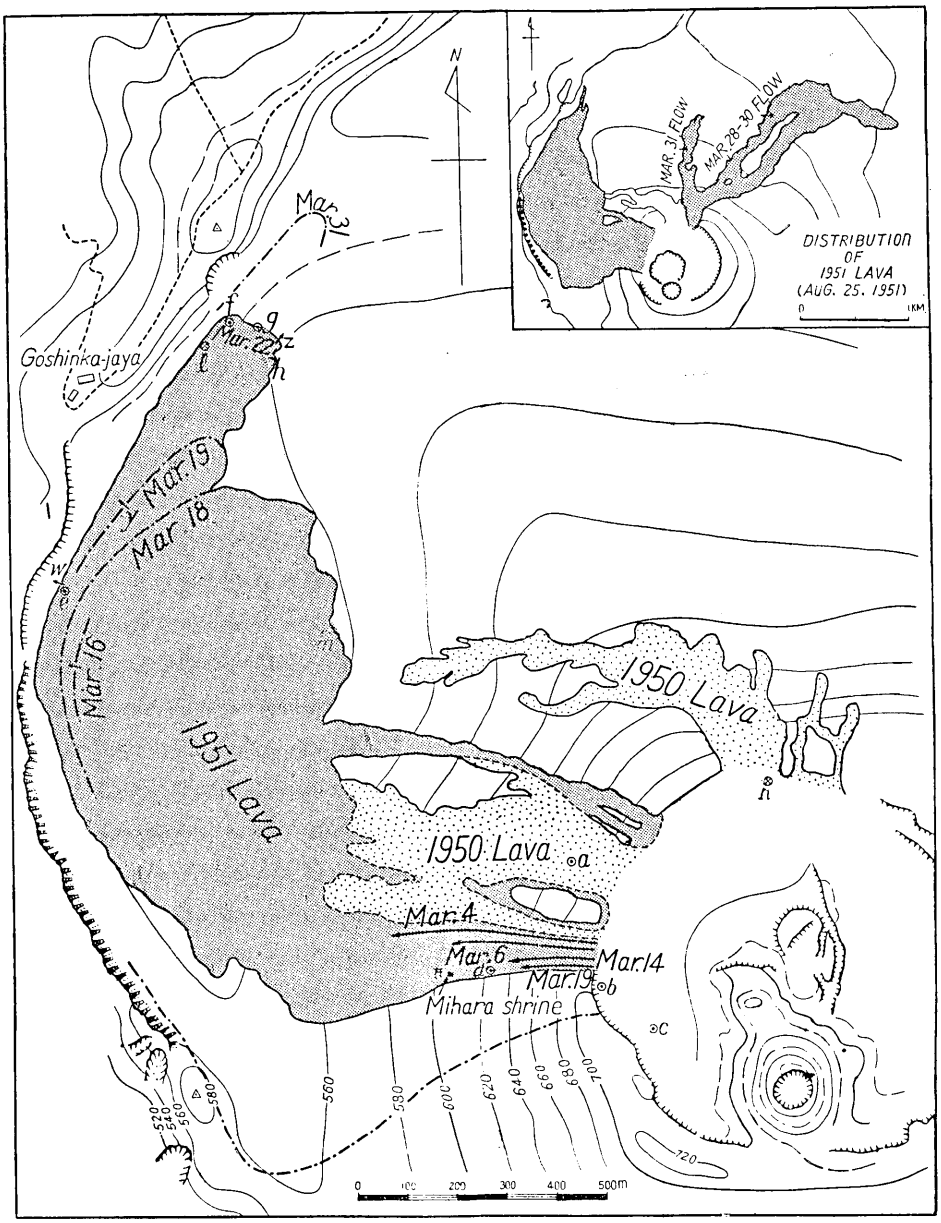

Fig. 120. Distribution of the lavas from Mihara crater during March, 1951. Arrows show the direction of lava-flowing. Chained lines show the fronts or margins of the lavas. Double circles and crossed circles indicate the points where the temperatures of the lavas were measured and the localities of some collected specimens respectively.

100 m wide near its farthest front. On March 31, another flow ran down the northern slope along the west margin of the just-mentioned one, and advanced straight northward for a distance of about 1 km within two days. It was 50 m to 150 m in width in its lower and middle courses, while its upper course was joined with that of the northeastern flow and also with one of the 1950 flows (Figs. 117, 118, and 120). The source vent of these flows was located in the northeastern part of the floor of Mihara crater, just below the inner wall of the crater (Fig. 119). Thus on March 30, at 15 h, red-hot lava was seen oozing out of a small opening in the solidified lava on the crater floor, flowing in a stream a few meters wide, and after travelling about 150 m northward along the base of the crater wall, it was flowing over the crater rim to pour in torrents down the mountain slope. The flow was typical *pahoehoe* in its extreme upper part on the crater floor, but on the steep slope outside the crater it quickly changed to *aa*.

The northern and northeastern flows had virtually stopped already on April 5, without making any remarkable advance beyond their fronts observed at the end of March. The course of these flows was similar to that of 1777–78 (An'ei lava flows), and they would undoubtedly have poured into the sea on the east coast of the island as the An'ei flows had done, if they had continued to flow for a longer period with further supply of lava from the source vent.

VIII. Review of the activity of February—March, 1951.

The 1951 eruption of Mihara crater, which started on Feb. 4, continued for about two months until the beginning of April, and after a few days' repose, it was resumed, but this time with intermittent explosions. Reviewing the continuous activity of February—March, we may distinguish it as "activity of the second period" from that of the first period, July—September, 1950, and of the third period, April—June, 1951.

The activity of the second period represented the peak of the volcanic cycle 1950–1951 as inferred from the changes of eruptions. It appeared to have been influenced by the northwest-southeast rift belt traversing the southwestern part of the floor of Mihara crater from near the top of the 1950 cinder cone to the northwestern rim of the crater. A line of activity had developed along the rift belt with explosions and lava outpourings, the explosive activity progressing along the rift from the crater floor toward the top of the 1950 cinder cone, and the effluent

activity in the opposite direction as far as the northwestern crater rim. Thus, the explosive activity started with a number of spatter cones on the crater floor, settled down to steady eruption at the top of the main cinder cone, while the effluent activity started with a few small lava flows at some of the new spatter cones, settled down to long-dated outflows from vents around the northwestern crater rim, with the result of forming an extensive lava field in the northwestern part of the caldera floor. At the final stage of the activity of the second period, a short-lived effluent activity occurred at the northeastern corner of Mihara crater, with lava-flows pouring over the northern crater-rim towards the northern and northeastern skirts of the central cone. This may be regarded as a prelude to the forthcoming activity of the third period, seeing that the latter took place exclusively in the eastern half of the crater floor.

During the entire course of the activity of the second period, the western half of the crater floor kept rising day by day, together with the 1950 cinder cone and the central upthrusted mound, although there occurred some intervening sinking locally as well as temporarily. Toward the end of March, immediately after the activity came to a halt, the crater floor tended to make rapid sinking. Certain changes in height of the crater floor, excepting those due to new filling and settling of the ground, seem to favour the supposition that there was a steady upward pressure of magma released partially by an occasional outbreaking, causing the rise and fall of the crater floor during the activity. The magma that took part in the activity of the second period may have been the same as that of 1950, still liquid in the conduit below, recharging itself with gases until it could extrude through the northwest-southeastern rift referred to.

During the activity characteristic harmonic tremors were registered at the Meteorological Observatory at Motomura almost continuously, although there were fluctuations in number and amplitude of the tremors, in accordance with the ebb and flow of the eruption. In the cases of larger eruptions as those of March 14–24, explosions were heard as thudding detonations, and in other cases they were felt at as far as Motomura, accompanied with the rattling of houses caused by air shocks.

(To be continued)

22. 伊豆大島三原山昭和25年及26年の噴火
その2　昭和26年の噴火 (*A*) 第2期の活動

地震研究所　津屋弘達・森本良平・小坂丈予

伊豆大島三原山の昭和26年の噴火は，2月4日開始，4月1日頃まで約2ケ月間，連続噴火し，小休止ののち，更に間歇的噴火を繰返して6月28日に終った．2月及び3月の噴火は，昭和25年，26年の噴火期間を通じての最高潮であった．われわれは，この連続噴火を，第2期の活動として，前回詳述した昭和25年7月16日—9月23日の第1期の活動[地震研究所彙報32号，第1冊，35–66頁]及び，4月2日以降6月28日に至る第3期の活動と区別して，ここにその噴火経過を詳しく記述した．

第2期の噴火は，三原火口の西半で行われた．とくに，前年の噴火によって生じた噴石丘頂上附近から，火口北西縁に至る，南東—北西方向の裂線に沿って演ぜられた（第72–73図参照），すなわち，爆発的活動は，噴石丘西側火口底に形成された熔岩々滴丘の活動に始まって，噴石丘頂上火孔の定常的爆発活動へと，南東に移行し，一方，熔岩の溢流は，熔岩々滴丘よりの流出に出発して，火口北西線に沿う火孔群から長期にわたって溢流するようになる．この結果，火口原（カルデラ底）北西に拡がる熔岩原が形成された（第120図）．この期の終りに，噴火は，火口の東半に移り，次期活動の前駆と見なされる，火口北東隅からの熔岩溢流がはじまる（第73図b）．

この期間を通じて，火口中央の噴石丘をも含めて，火口底の西半は，局部的及び一時的沈下はあったが，全般的に，上昇を続け，3月下旬活動休止後急激に沈下した．この火口底の上昇，沈下は，それぞれ，岩漿の上昇と，熔岩溢出によるガス圧の低下によるものである．火山微動の盛衰も，この火口における噴火の消長と，きわめてよく調和していた（未完）．

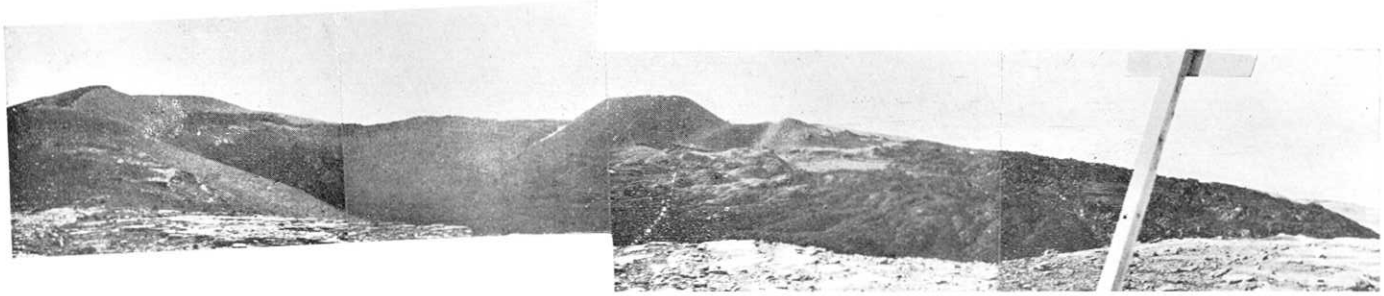

Fig. 62. Mihara crater at the time of quiescence following the 1950 eruption, with the 1950 cinder cone in the centre, Dec. 11, 1950. Looking south from the north rim of the crater.

Fig. 63. The northern inner wall of summit crater of the 1950 cinder cone, with the highest rim (Kenga-miné) of Mihara crater in the back ground, Dec. 11, 1950.

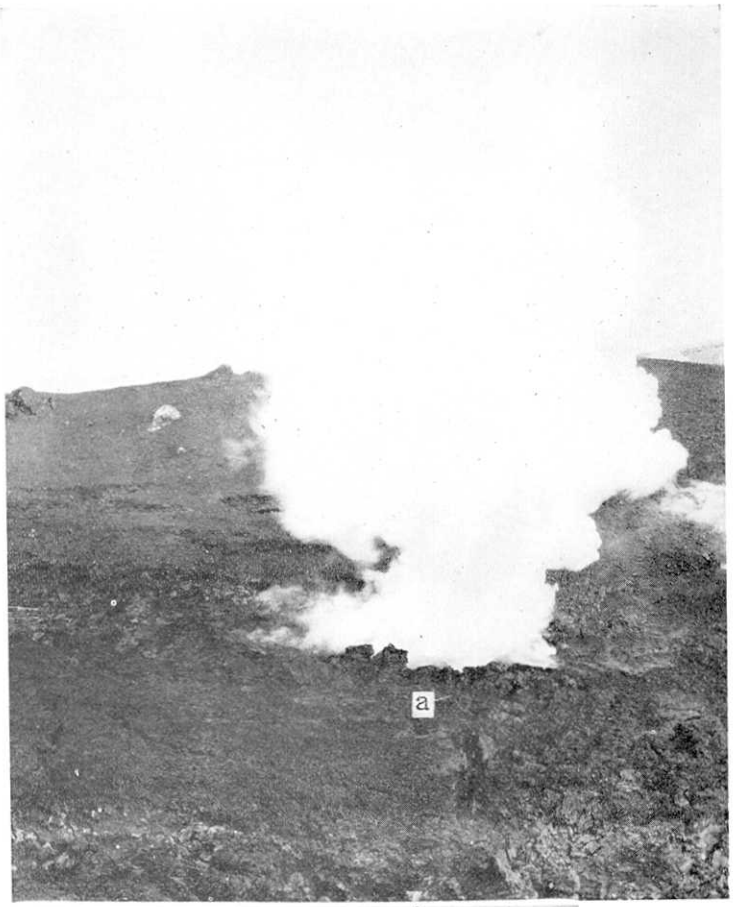

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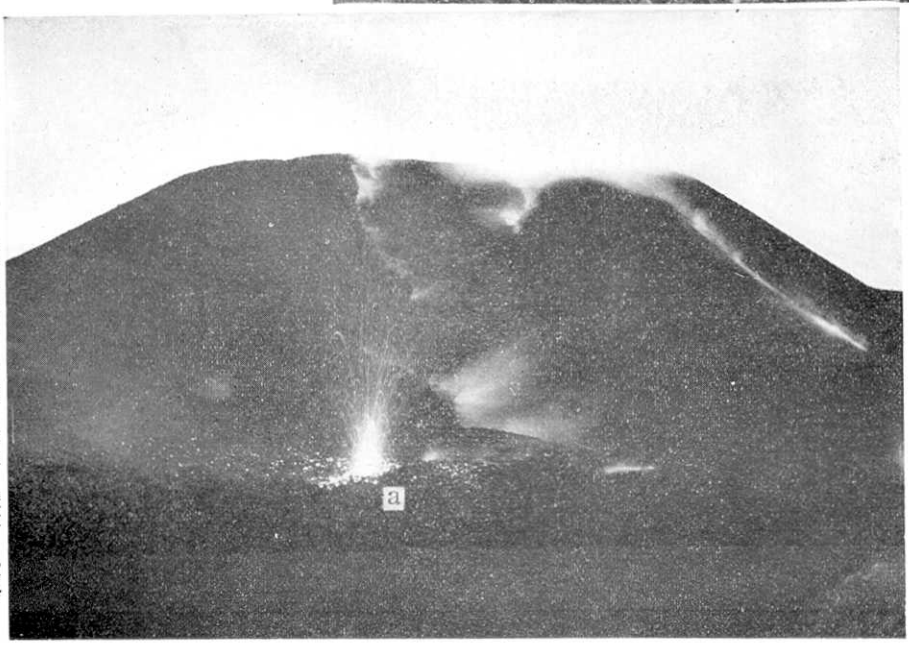
Fig. 64. Vapour rising from vent (a) on the western floor of Mihara crater, showing the opening of the 1951 eruption, Feb. 4, 1951.
Photo. Miyajima.

Fig. 65. Explosive emission of incandescent lava from vent (a), with the 1950 cinder cone in the background, Feb. 4, 1951.
Photo. S. Watanabe. ↓



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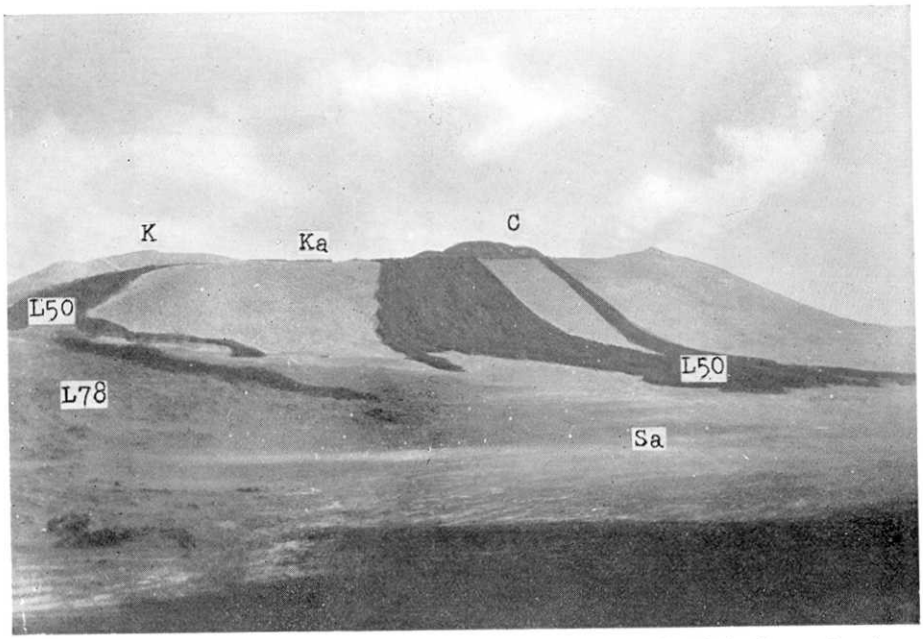


Fig. 66. Mt. Mihara as viewed southeastward from Goshinka-jaya showing vapour-cloud rising from the western floor of Mihara crater (on the right of C), Feb. 6, 1951. C:1950 cinder cone. L50:1950 lava flows. L78:1778 lava. K:Kengaminé. Ka: Kakô-jaya. Sa: Sabaku (caldera floor). Photo. S. Watanabe.

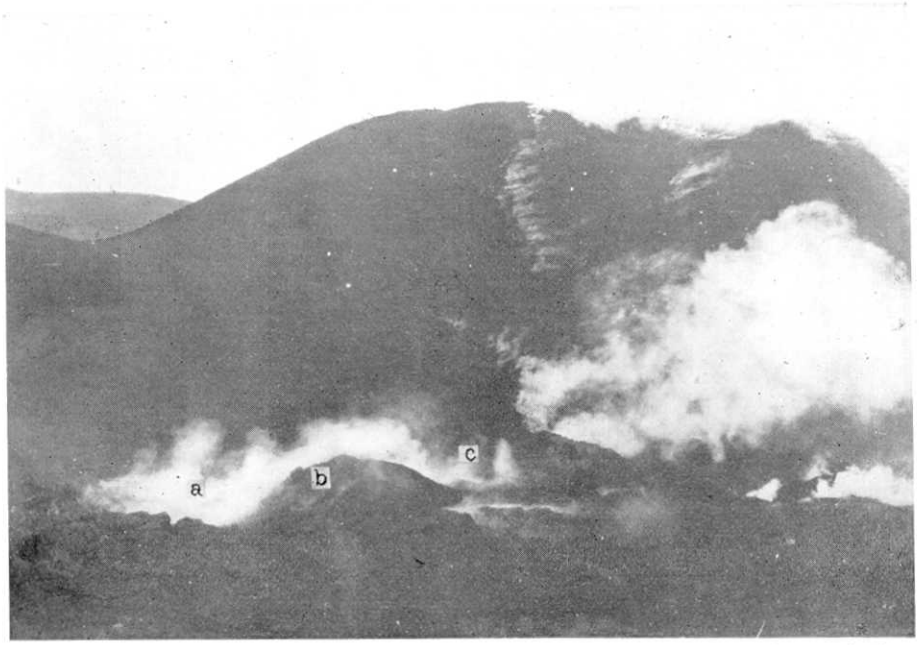


Fig. 67. Showing active vents (a), (b) and (c) on the northwest base of the 1950 cinder cone, Feb. 6, 1951. Photo. S. Watanabe.

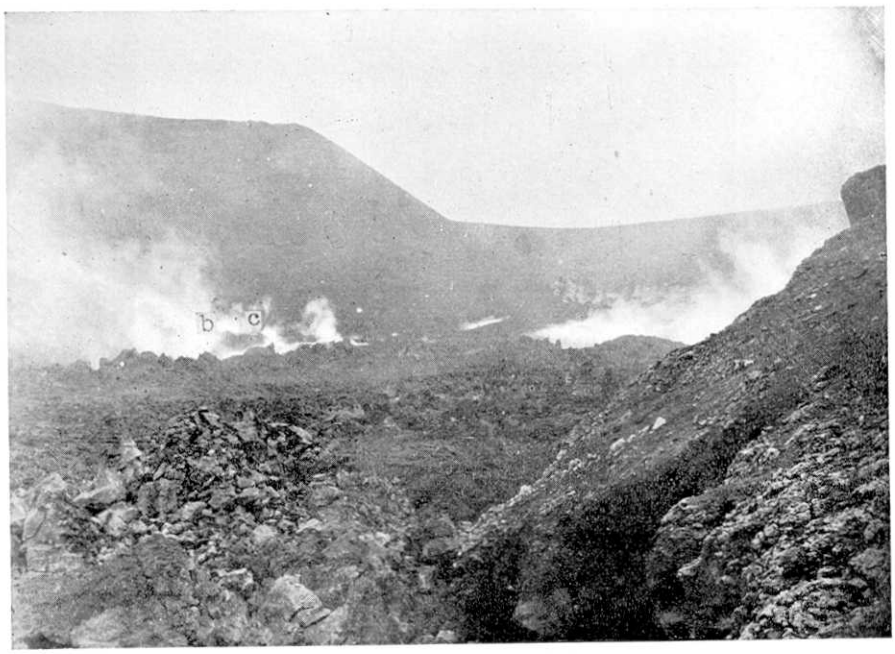


Fig. 68. Showing active vents (b) and (c), Feb. 9, 1951. Vent (d) was formed within the steaming area on the right. Photo. S. Watanabe.

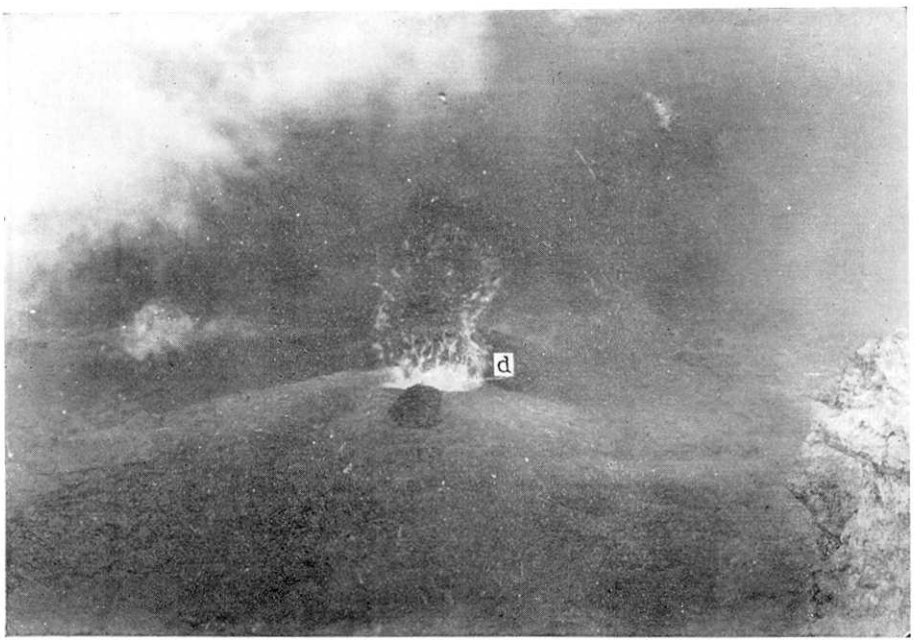


Fig. 69. Vent (d), showing lava spattering with flow, Feb. 13, 1951. Photo. S. Watanabe.

Fig. 70. Spatter cones covered with cinders and bombs (b~f), Feb. 17, 1951. The 1950 cinder cone in the back shows new steam vents formed by fissuring and slumping on its northwest side. Photo. S. Watanabe.

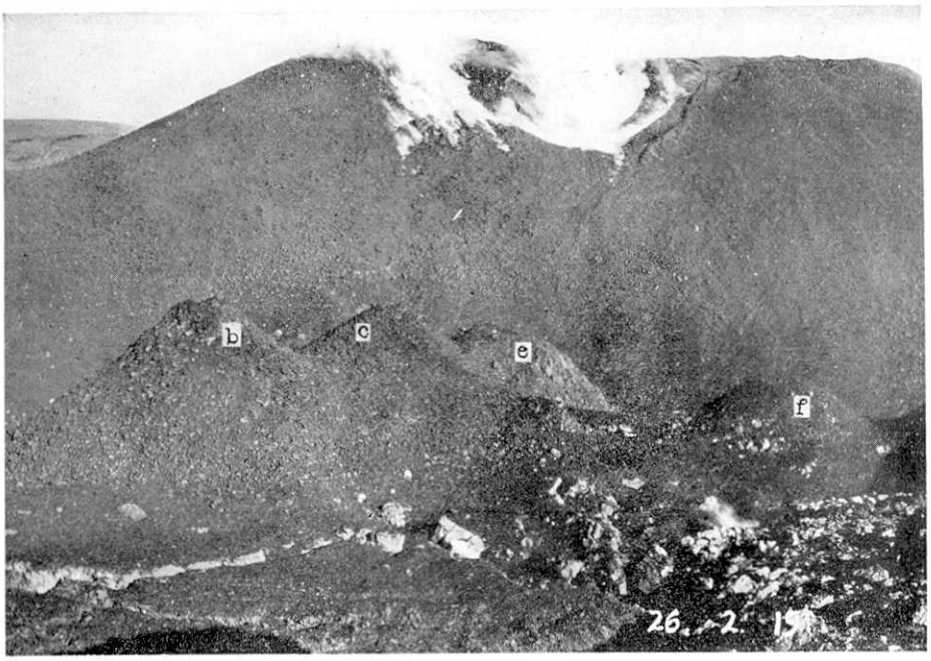


Fig. 71. Ditto. Feb. 19, 1951. Photo. M. Miyajima.

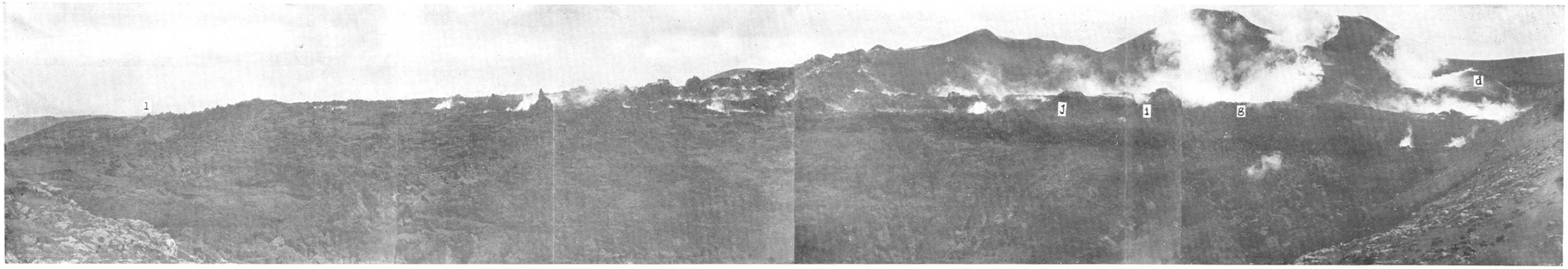


Fig. 74. The western half of Mihara crater, showing line of active vents (b—l) on the crater floor, with the new active craters on the 1950 cinder cone in the right background, March 2, 1951. The lower hill on the left of the cinder cone is the central mound upthrusted from below at the site of the former central pit.
Photo. S. Watanabe.

Fig. 75. Small lava flows on the sides of the spatter cone (j), March 6, 1951.
Photo. S. Watanabe.

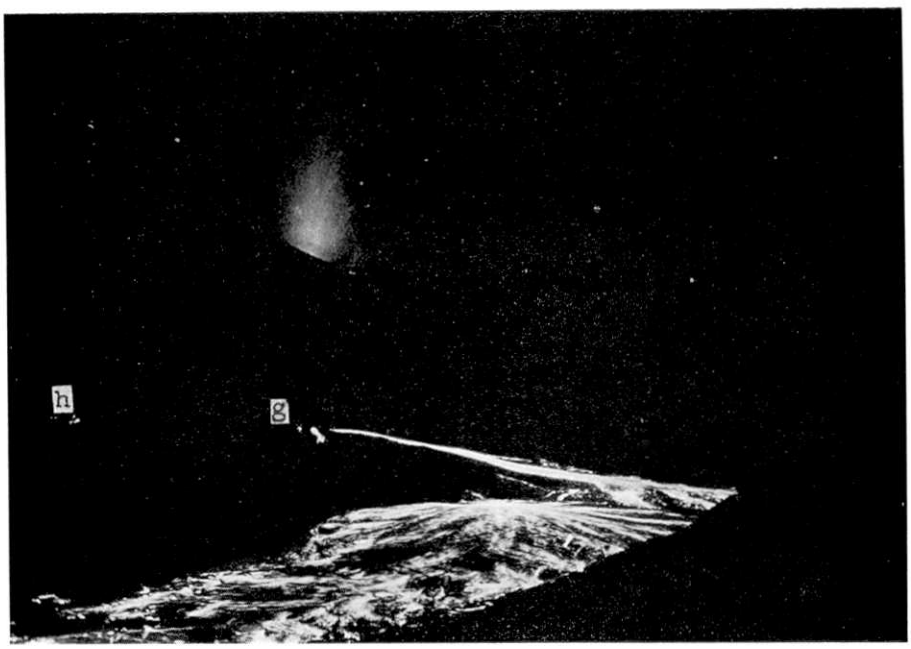


Fig. 76. Night view of lava flow from a temporary vent near the vent (g), with explosive emission of lava on the 1950 cone in the background, March 7, 1951.
Photo. S. Watanabe.

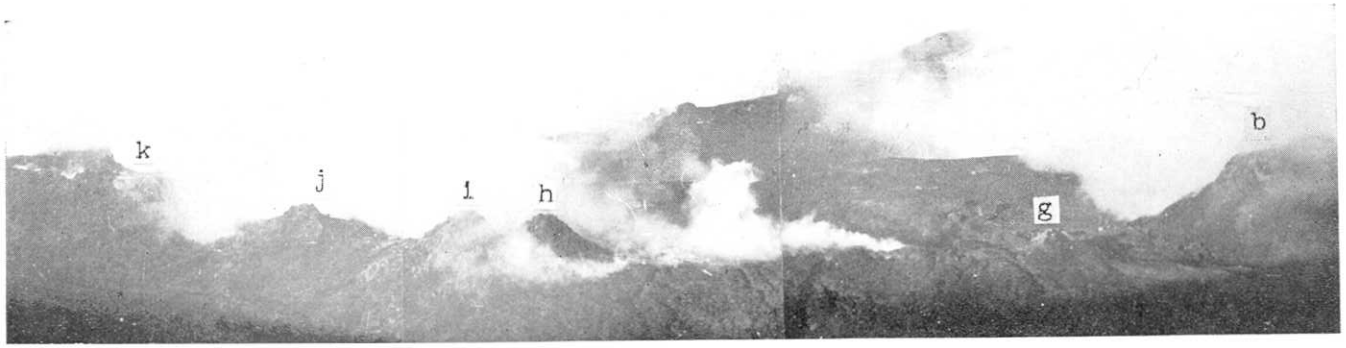


Fig. 77. The western part of Mihara crater, showing line of the fully-developed spatter cones (b—k), March 16, 1951.

Fig. 78. Spatter cones (l) and (m) on the northwestern extension of the line g—k (Fig. 77) and close to the northwestern rim of Mihara crater. One of the source vents of lava flows on the northwest slope was located at V, March 16, 1951.

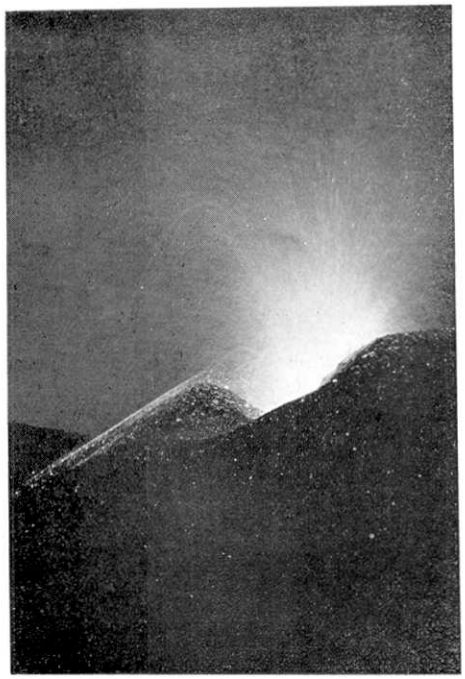


Fig. 79. Explosive emission of incandescent lava at the new main vent on the 1950 cinder cone, March 16, 1951.
Photo. S. Watanabe.

Fig. 80. Black ash cloud vomiting from the new main vent on the 1950 cinder cone, March 16, 1951. Spatter cone (d) lower right.
Photo. S. Watanabe.

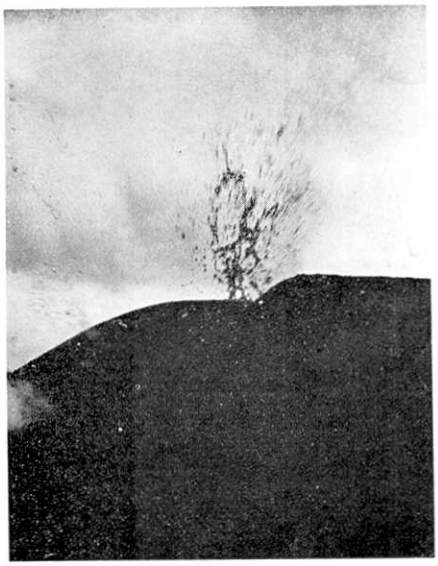


Fig. 81. Explosive emission of lava at the new main vent on the 1950 cinder cone, March 20, 1951.
Photo. S. Watanabe.

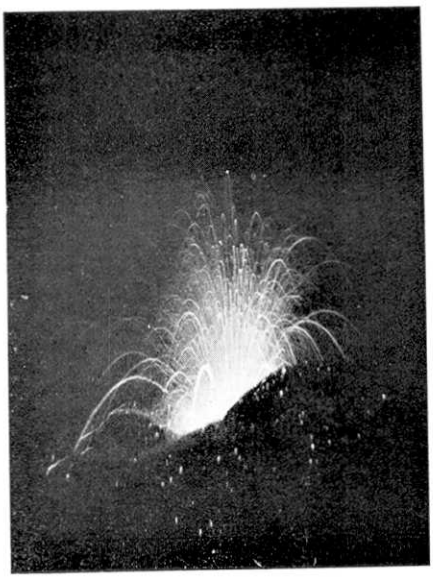


Fig. 82. Ditto. (night view), March 16, 1951.

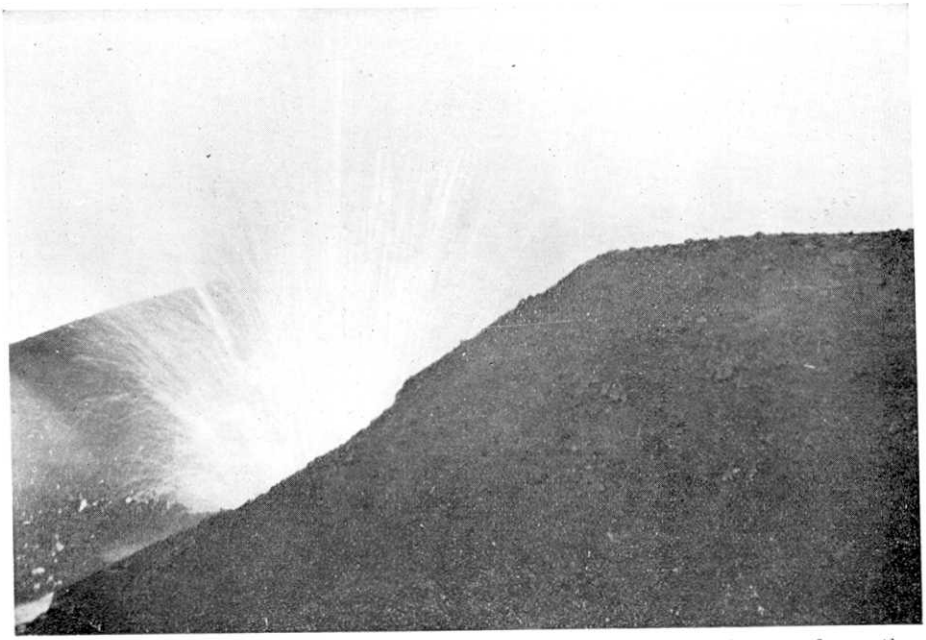


Fig. 83. Close-up of trajectories of incandescent masses thrown from the main vent on the 1950 cinder cone, March 18, 1951. (Telephoto.)

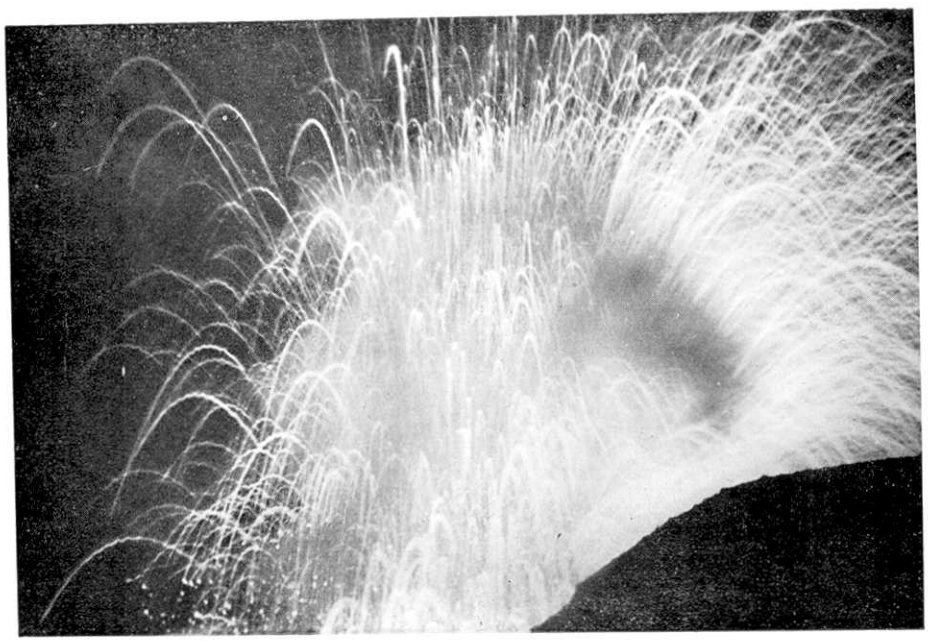


Fig. 84. Ditto. (night view)

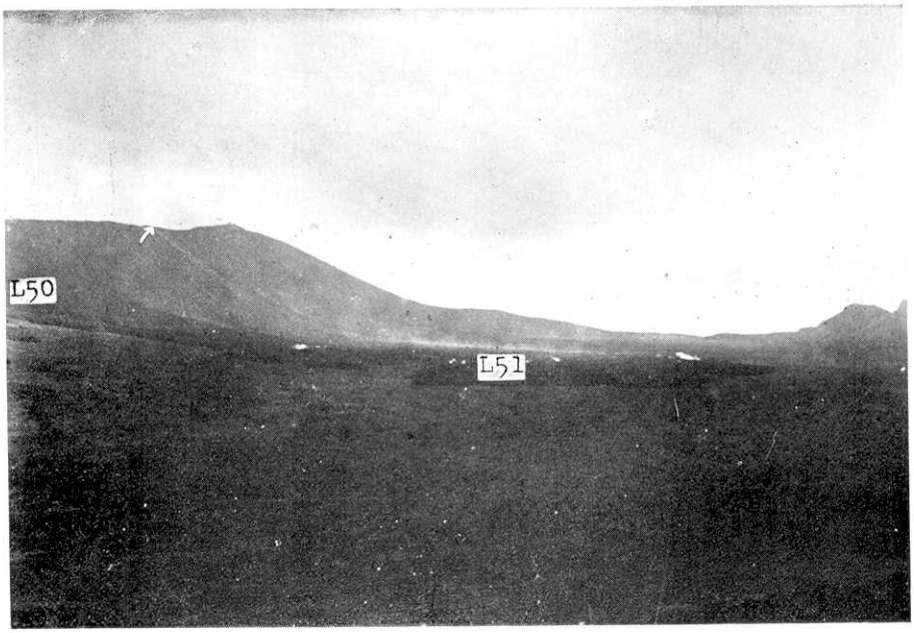


Fig. 85. New lava flowing down the northwestern slope (arrow's head) of Mt. Mihara and spreading over the flat ground of Sabaku (caldera floor), March 1, 1951. L50:1950 lava. L51:1951 lava. Photo. S. Watanabe.

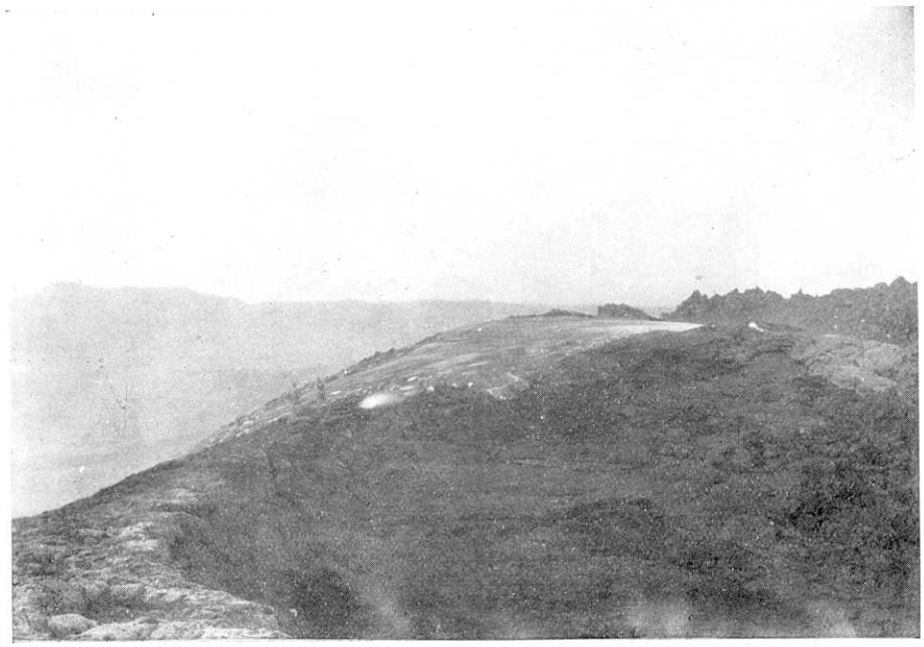


Fig. 36. Incandescent lava spurting from a vent on the northwest rim of Mihara crater and flowing away downslope, March 2, 1951.
Photo. S. Watanabe.

Fig. 87. Incandescent lava flowing down the western slope of Mt. Mihara, March 7, 1951. The small shrine (Mihara-jinja) at the right was about to be destroyed by the advancing lava. Photo. S. Watanabe.

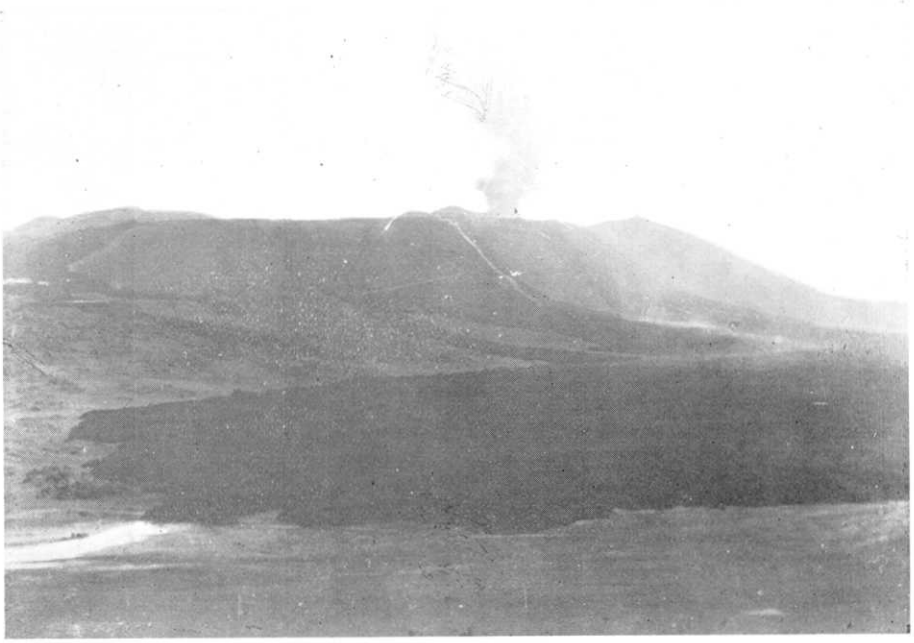


Fig. 88. New lava flows had spread extensively over the flat ground of Sabaku (caldera floor), the farthest front coming close to the caldera wall near Goshinka-jaya, March 12, 1951. Photo. S. Watanabe.

Fig. 89. Telephoto view of three source vents of lava flows on the northwest slope of Mt. Mihara, March 17, 1951. See Fig. 90.

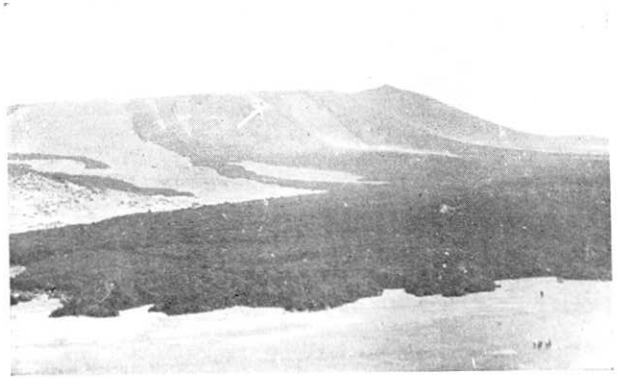


Fig. 90. Steaming lava flows and their source vents (shown by arrow's head) on the northwest slope of Mt. Mihara, March 17, 1951.

Fig. 91. Lava grotto (shown by arrow's head) from which an incandescent lava was cascading the day before to join into the main flow, March 18, 1951. See Fig. 100.

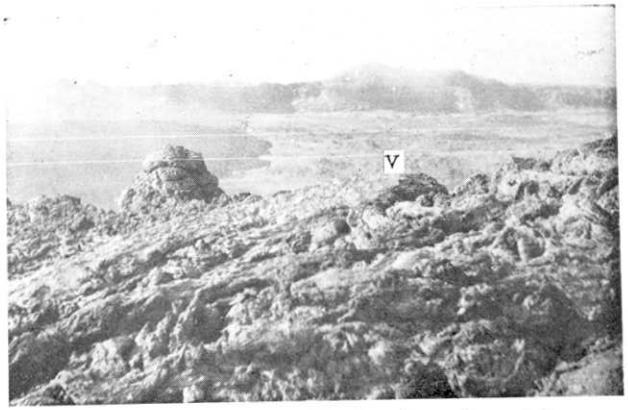


Fig. 92. Source vent (V) of an incandescent lava flow, March 18, 1951.

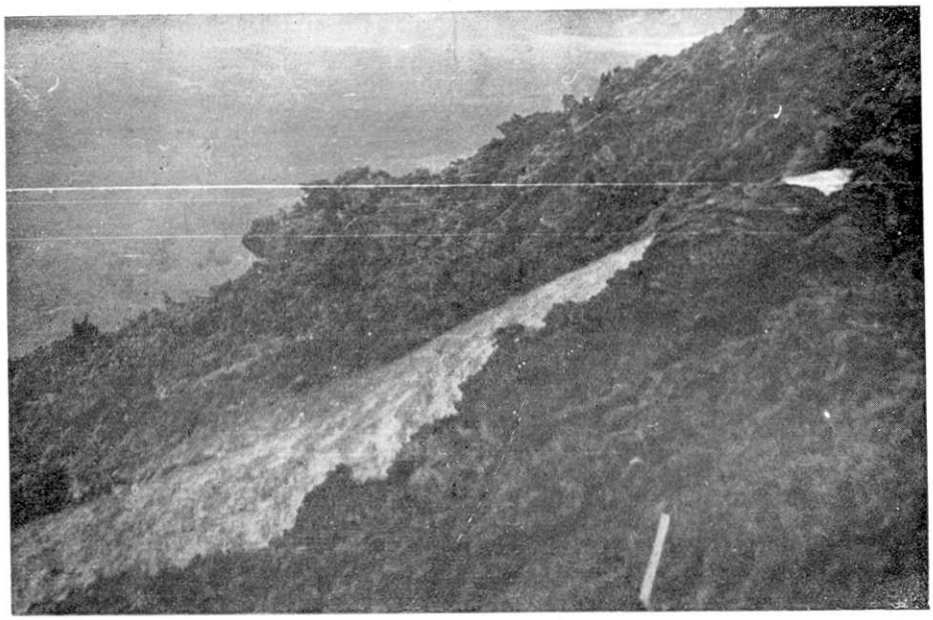


Fig. 93. Incandescent lava flow near its outlet in the edge of a lava tunnel, March 18, 1951.

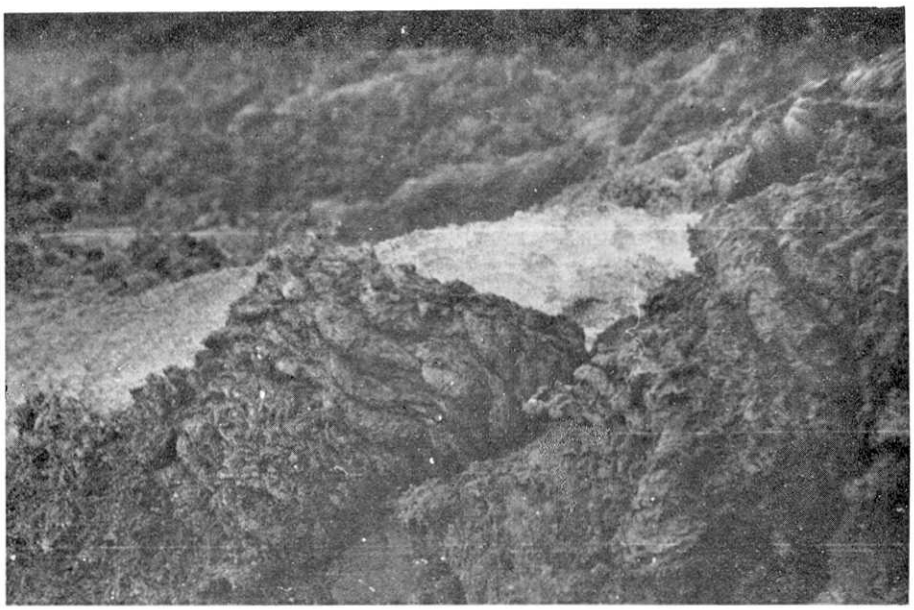


Fig. 94. Close-up detail of the same flow as shown in Fig. 93, March 18, 1951.

Fig. 95. Lava flow, March 18, 1951.

Fig. 96. Ditto. Looking upstream, March 18, 1951.

Fig. 97. Ditto. Looking downsteam, March 18, 1951.

Fig. 98. Ditto. Showing ropy crust, March 18, 1951.

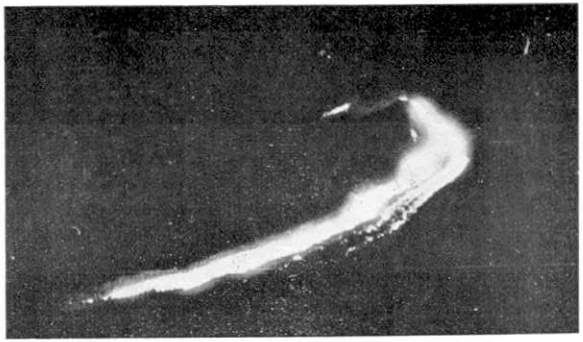


Fig. 99. Night view of lava flowing down the west slope of Mt. Mihara, March 18, 1951.

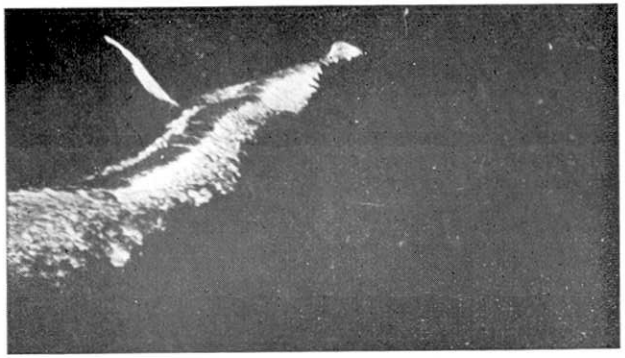


Fig. 100. Night view of lava flowing down the west slope, March 17, 1951. Lava cascade (upper left) joining into the main flow (right). See Fig. 91.

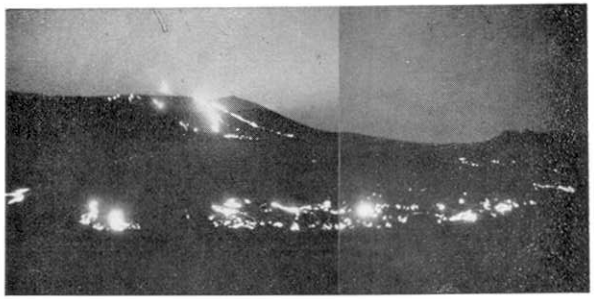


Fig. 101. Night view of Mt. Mihara from Goshinka-jaya, March 18, 1951.

Fig. 102. The same by day, March 16, 1951.

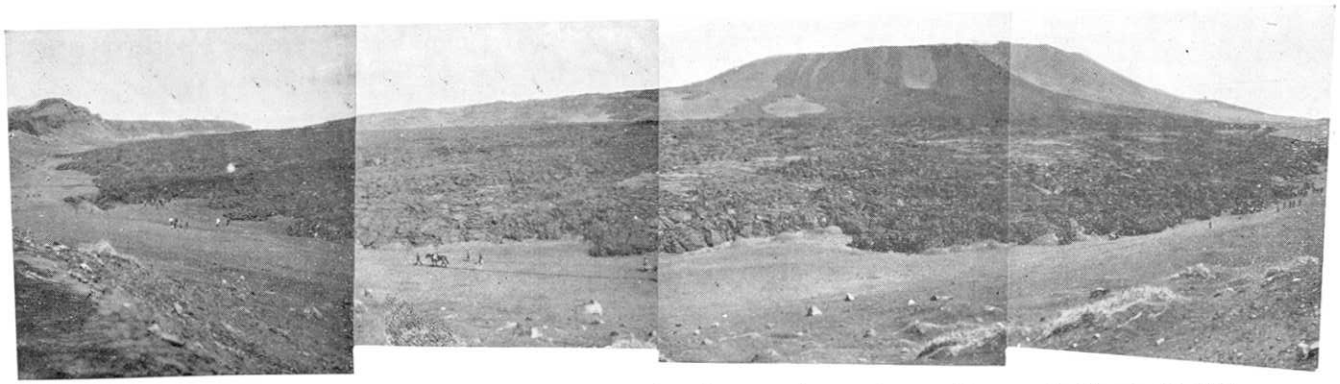


Fig. 103. New lava flows, as viewed east from the talus slope on the western caldera wall, March 18, 1951.

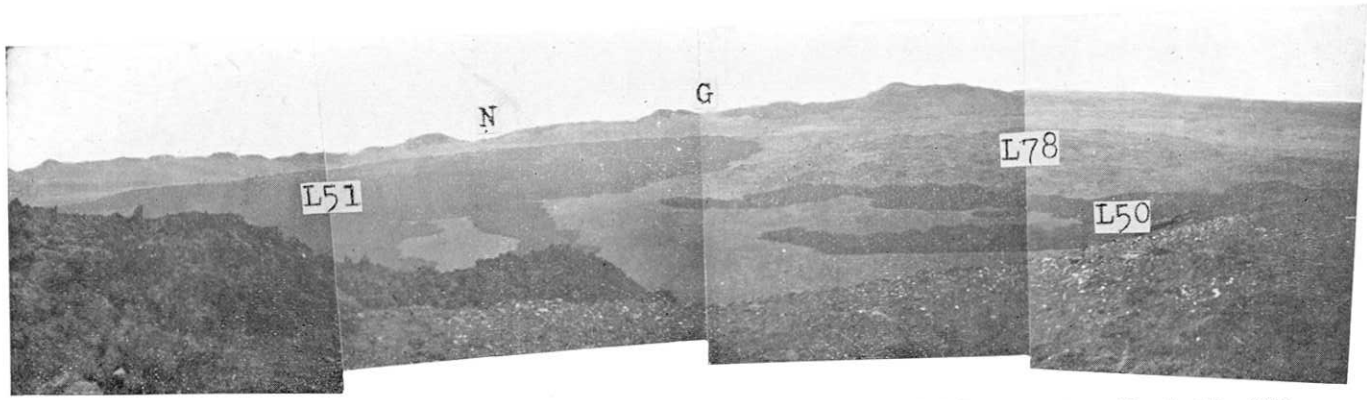


Fig. 104. New lava flows, looking down west from the northern rim of Mihara crater, March 17, 1951. L51: 1951 lava. L50: 1950 lava. L78: 1778 (An'ei) lava. G: Goshinka-jaya. N: Passage to Nomashi village.

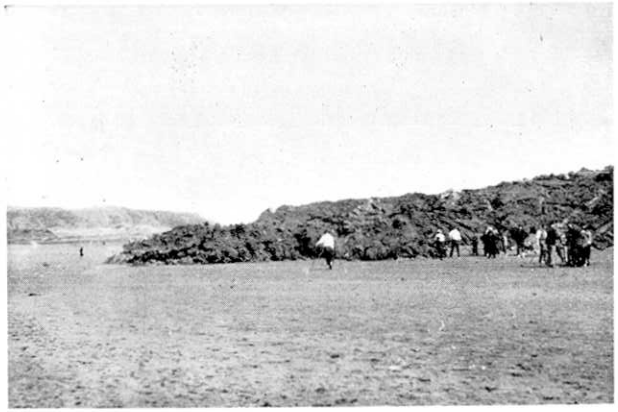


Fig. 105. Lava front near Goshinka-jaya, March 18, 1951.

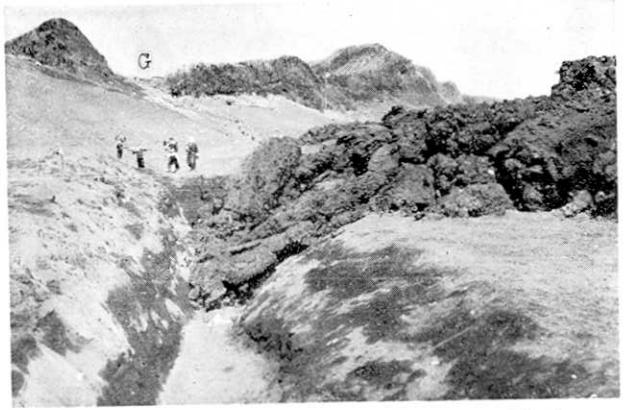


Fig. 106. Lava front creeping into an artifical ditch, March 18, 1951. G: Goshinka-jaya.

Fig. 107. *Aa* front approaching the western caldera wall, March 18, 1951.

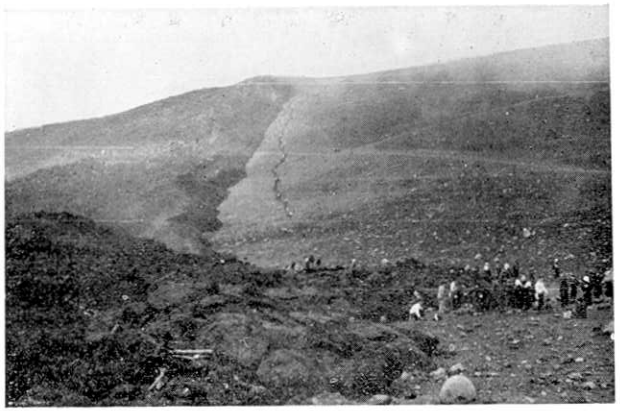


Fig. 108. The southern margin of lava flows, March 18, 1951. The Mihara Shrine had already been buried under the flows.

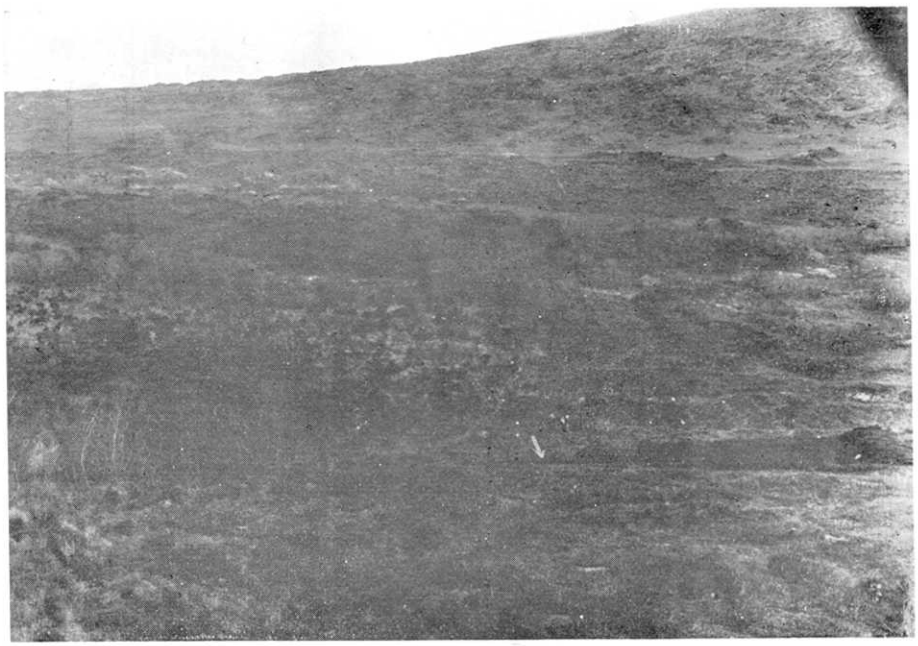


Fig. 109. The farthest front (arrow's head) advancing into bushy land northeast of Goshinka-jaya, March 22, 1951. Photo. S. Watanabe.

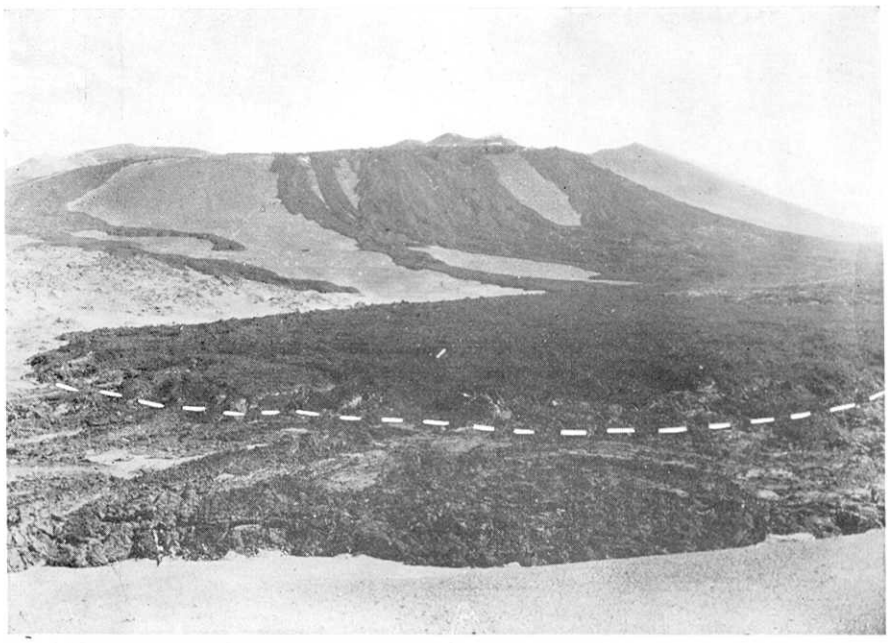
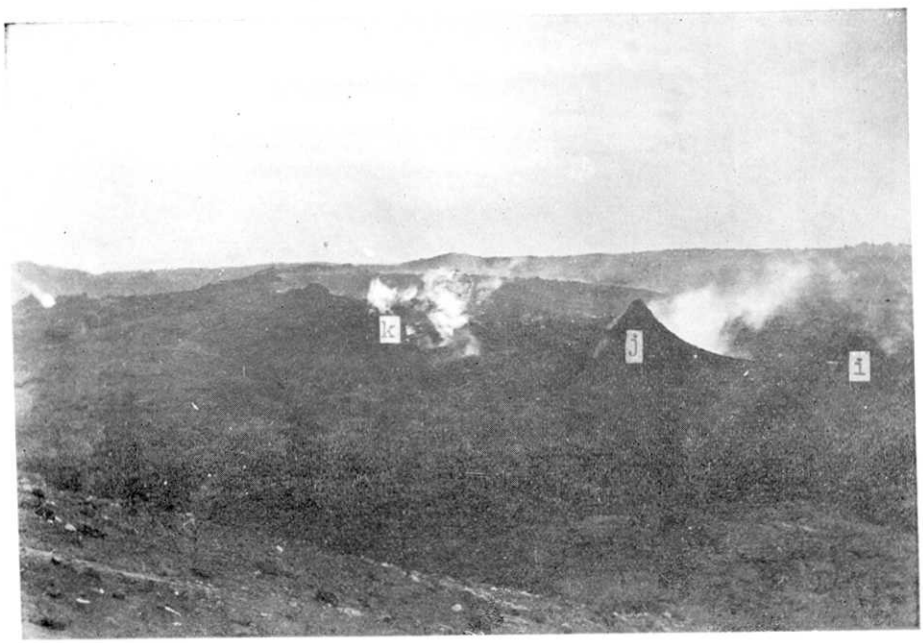


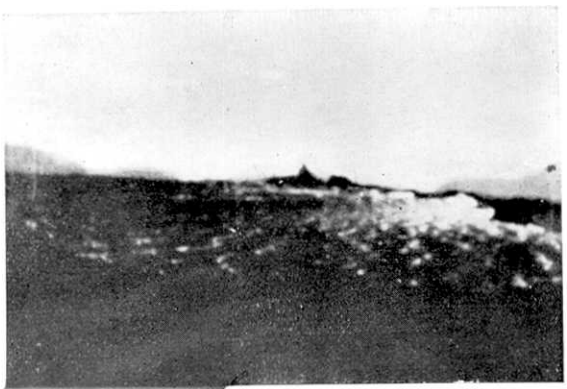
Fig. 110. New lava flows, showing flow advance by outflow from secondary vents (tunnels and cracks) on the front, March 23, 1951. Chain line shows the front on March 12. Cf. Figs. 78, 100. Photo. S. Watanabe.

Fig. 111. Aerial view of Oshima volcano, showing Mihara crater (K—M) with new lava flows and the steaming cinder cone, March 23, 1951. G: Goshinka-jaya. N: Passage to Nomashi village. S: Shiroishi-yama. G—N—S: Somma. (The Yomiuri Press.)



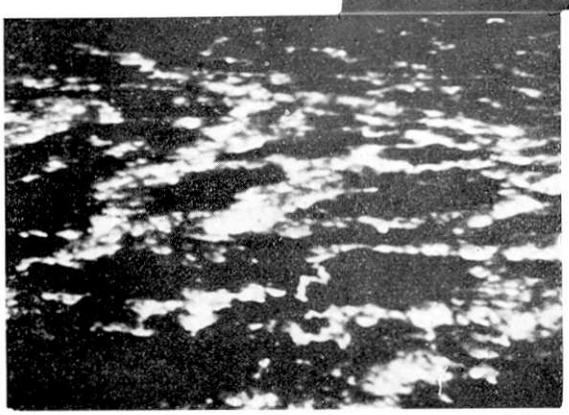
↑

Fig. 112. Lava pool looking northeast from the west rim of Mihara crater, March 25, 1951. The spatter cone (j) near centre right. Photo. S. Watanabe.



↑

Fig. 113. vLaa pool looking southwest, with bright zigzag lines in the lava crust, March 25, 1951. (One cut from the 16 mm moving pictures taken by the Ministry of Education.)



← Fig. 114. Detail of the bright lines in the lava pool, March 25, 1951. (Ditto.)

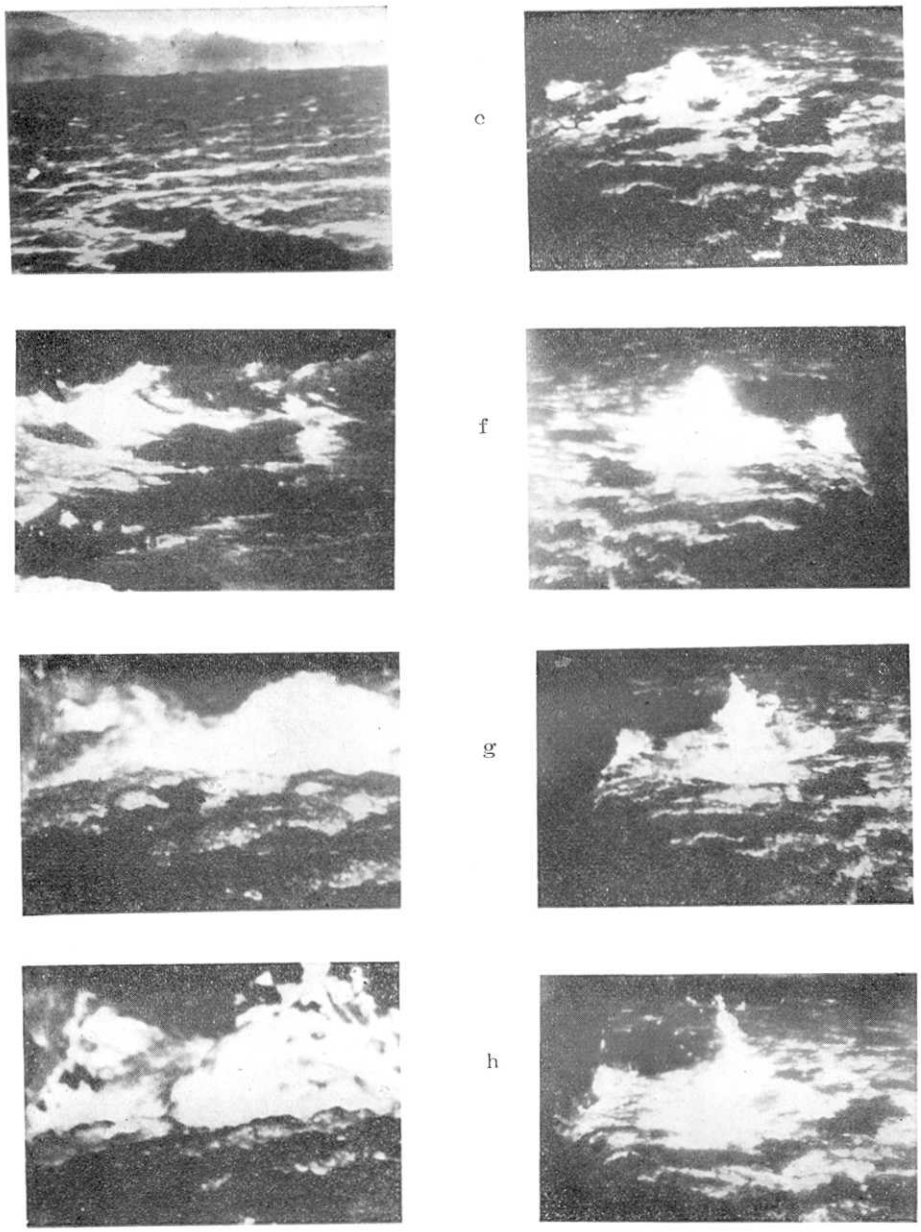


Fig. 115. Lava pool with its source fountain.
a, b. Pool lava flowing toward and into grotto on the shore near the fountain.
c, d. Pool lava doming up and spattering at the fountain.
e~h. Successive views of the lava fountain.
(Cuts from the 16 mm moving pictures taken by the Ministry of Education.)

Fig. 116. Eastern half of Mihara crater, looking southeast from near the highest point (Kengaminé) on the east rim of the crater, March 17, 1951.

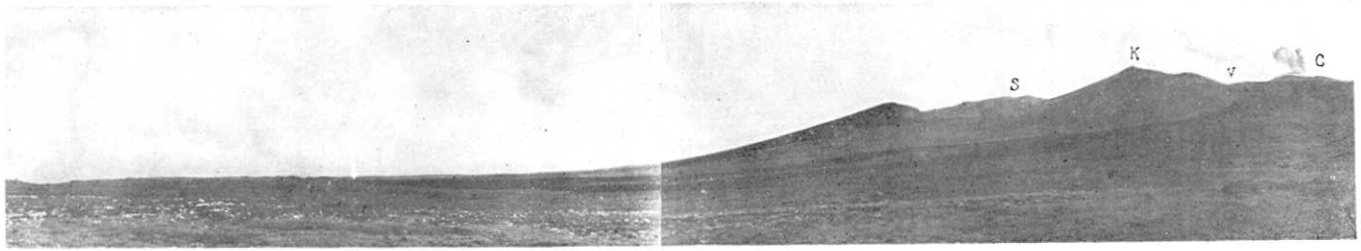


Fig. 117. New lava flows on the northeast slope of Mt. Mihara, March 29, 1951. Arrow's head shows farthest front. K: Kengaminé, S: Shiroishiyama (somma), C: 1951 cinder cone, v: Outlet of the flows on the northeast rim of Mihara crater. Photo. S. Watanabe.

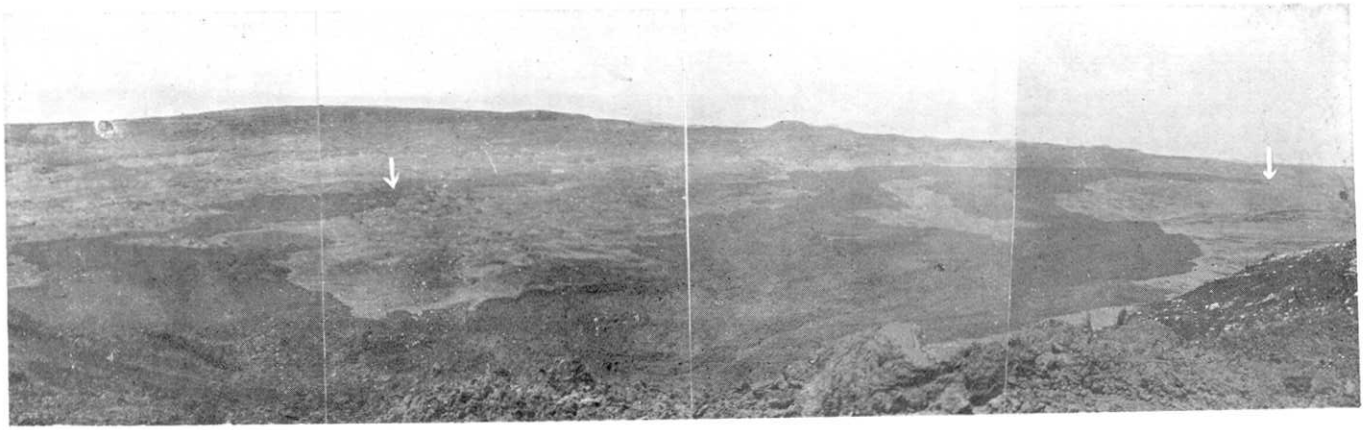


Fig. 118. New lava flows, looking down north from near the outlet of the flows on the northeast rim of Mihara crater, April 30, 1951.

Fig. 119. Lava oozing out of *pahoehoe* crust on floor of the northeastern corner of Mihara crater, March 30; 1951. The 1950 cinder cone on the left back ground. Photo. S. Watanabe.