Chapter X. Notes on the Craterlets of the Anei (1779) and Bummei (1468-1476) Eruptions.

59. Comparison of old and recent craterlets. The larger explosion craterlets of the Sakura-jima eruptions in the periods of Anei (1779) and Bummei (1468–1476) are found to be not much different in magnitude from those formed in the eruption of 1914 : a fact which seems to indicate that the explosive force of the volcano did not much vary in the different outbursts during the several hundred years since the 15th century. Some of the old lava sources remain also in a well preserved condition, presenting an appearance similar to those in the recent eruption. (For the position of the craterlets and lava sources, see Pl. IX of the present Volume.)

60. Anei (1779) eruption : southern craterlets. The eruption began first from the upper craterlet on the southern or Furusato side, although the eruptive energy there was much smaller than on the north-eastern or Komen side.

Lower Lava Source. The lava source at the lower craterlet, situated 260 m above sea-level at the distance of 1250 m to the N. 18°E. of the hot spring in the village of Furusato, is much similar in arrangement to that in the recent eruption formed below the eastern craterlet No. 4′, being a sort of an U-shaped cavity, 160 m in length, 50 m in width, and 20 m in depth. The lava outflow from this source, locally known as a *hoge* (" fire place "), has run down along the eastern side of that from the higher craterlet and can be clearly traced down to the coast. It seems to have run out some days after the commencement of the eruption, being coated with no special layer of pumice and ash.

Higher Craterlet. The higher craterlet, occupying the bottom of a large U-shaped old explosion basin at the southern flank of

Sakura-jima Eruption of Bummei Period (1475). Uppermost Craterlet on the S.W. Side. (Oct. 1916. F. Omori, photo.)

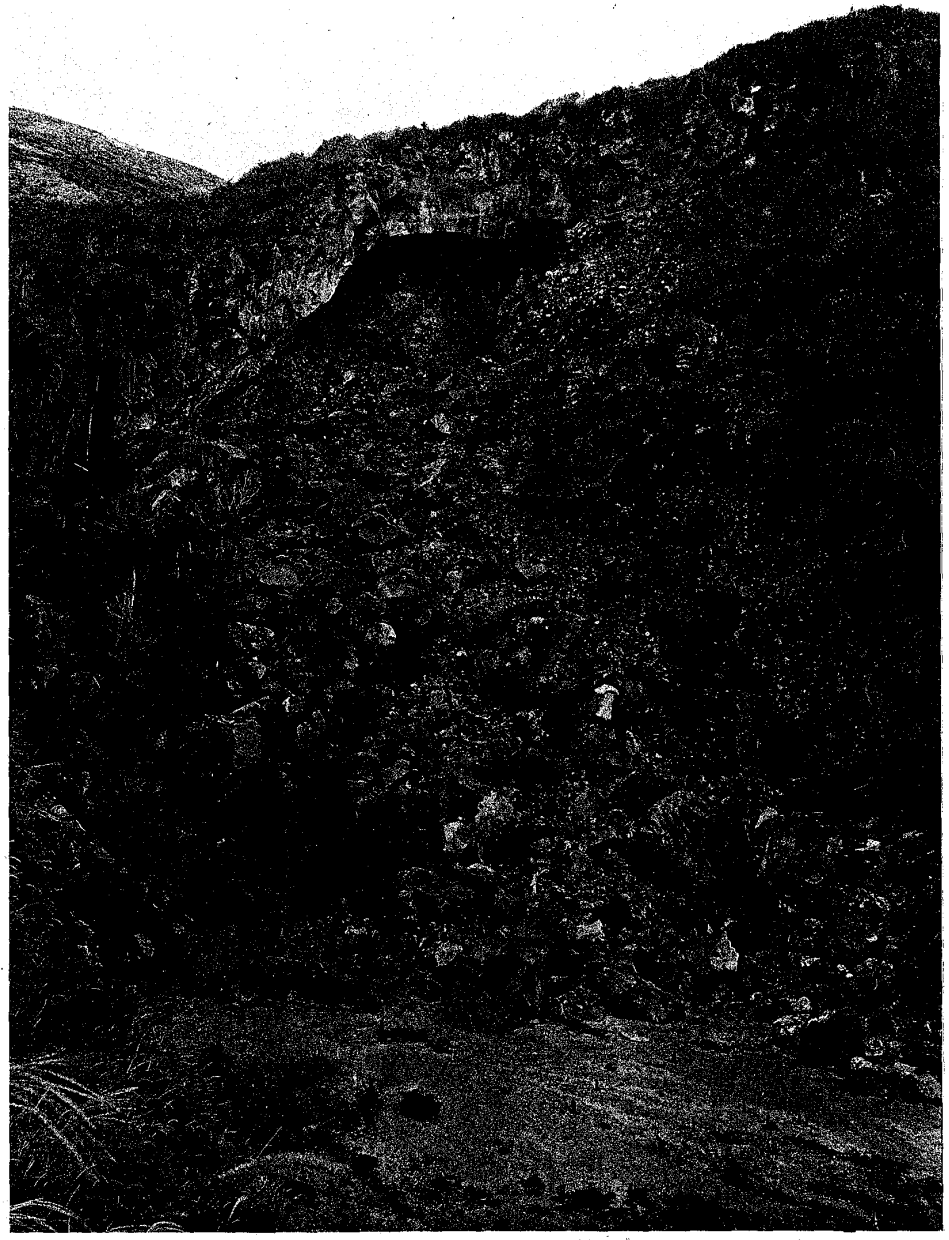

Fig. 132. The Craterlet seen from the lower or S.W. rim, showing the bottom and the N.E. inner slope.

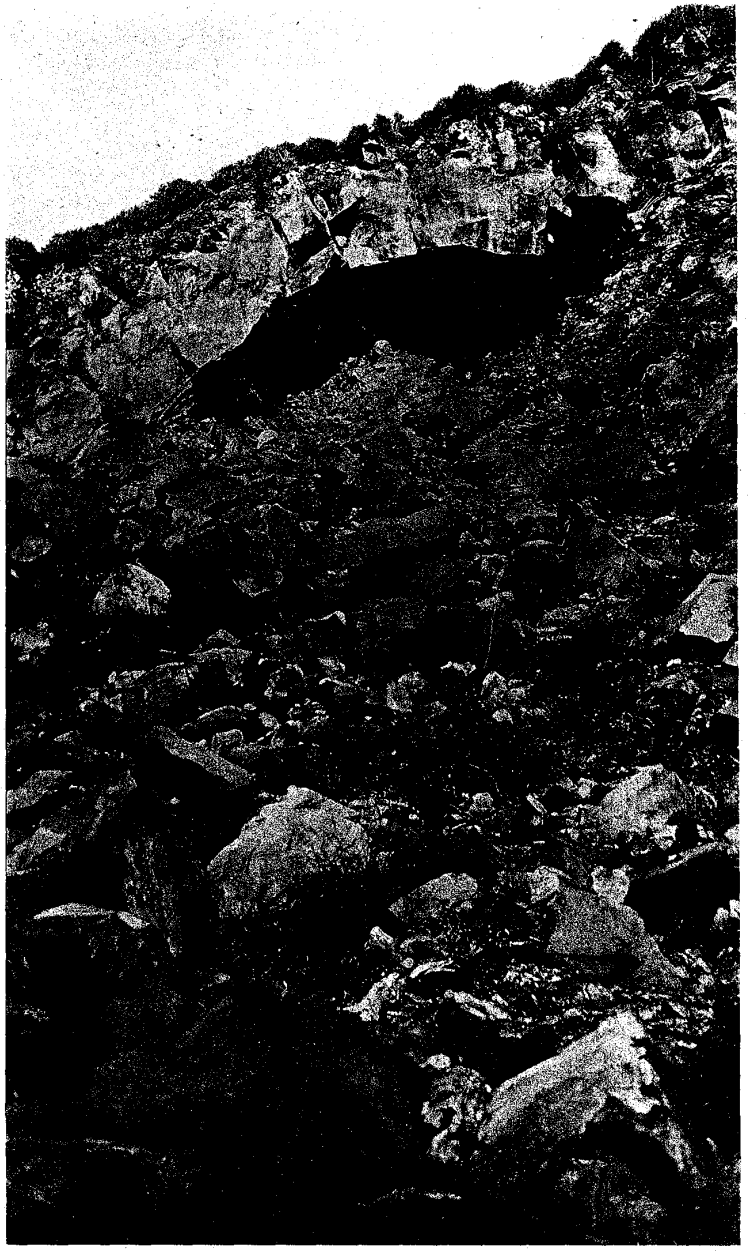

Fig. 133. Nearer View of the Lava Arch at the top of the N.E. side wall.

Minami-dake, is situated at the height of 700 m above sea-level. The two limbs of the U, which is covered by layers of pumice and ash, still indicate traces of old dislocations and cracks, presenting an appearance somewhat similar to the disturbed grounds above the western lava sources Nos. 2 and 3 of the recent eruption. The lava from the upper craterlet progressed nearly southwards and reached the coast at the east of the hot spring of Furusato.

The main portion of the flow from the lower source took a course south slightly east and formed the new promontory of Tatsu-zaki*. A small bifurcation of the stream reached down across to the beach of Yunohama, thus leaving between the latter and Tatsu-zaki a piece of headland uncovered by the Anei lavas. This evidently marks the end of a small former ridge composing the eastern boundary of the main lava field. The length and the base width of the aggregate lower lava area are about 2.4 and 1.0 km respectively.

61. Anei (1779) eruption; north-eastern craterlets. The two large U-shaped craters or *higona* ("fire holes") at the N.E. flank of Kita-dake, whose bottom is situated at heights of about 700 m above sea-level, evidently belong to much remote epochs, their inside walls showing no exposure of compact rocks. The well preserved lava mound which is situated at the height of 550 m above sea-level and which indicates on its west side a sort of lava moraine, is probably to be taken as the source of the upper lava stream of the Anei (1779) eruption.

The second vent, situated about $1\frac{1}{2}$ km to the S. slightly W. of the village of Komen, is a regular explosion craterlet of 150 m mouth diameter, with rugged rocky wall, its upper lip being 280 m

* "Dragon promontory," so named from the year of the eruption, 1779, which corresponds to the sign of *tatsu* or dragon in the old Japanese calendar.

above sea-level or 67 m higher than its bottom plane, which is sandy and 30 m in extension. Only a short distance to the north of, and no doubt closely related to, the cavity in question, there is the large U-shaped third craterlet with the upper rim at about 240 m above sea-level, from which descends the hilly mass marked by a series of successive transverse dislocations ; this being the origin of the lava stream, whose course is well indicated by the prominence of its sides and which, running down to the coast, formed the cape of Nishiseko-hana and the eastern boundary of the present bay of Komen.

The fourth craterlet, which is situated on the gentle slope, 140 m above sea-level, and quite close to the road leading from Krokami to Komen, about 1 km to the S.E. of the latter village, is a double cavity, of which the lower compartment is the larger, with the depth of 22 m and the mouth and bottom diameters respectively of 80 and 35 m. Several other small craterlets may possibly be discovered on the N.E. eruption field, if minutely searched for. Beside the Sono-yama hill at Moto-Komen, there are two spots in the vicinity which were not buried by the Anei lava flow.

The present coastal portion of the north-eastern lava area lying out of the N.W. and S.E. straight line joining the beaches of Komen and of the small hamlet of Uranomae represents approximately the land increment caused by the eruption of 1779, the maximum seaward prolongation thus effected being some 0.9 km.

62. Bummei eruption : eastern craterlets. The eastern lava area of the Bummei (1468–1471) eruption is bounded on the southern side by the ridge of a marked "side moraine," which, being thickly covered with pumice and ash, looks like an embankment, and runs in a nearly unbroken line for the distance of 3 km, forming the northern barrier of the flat Krokami plain.

The maximum relative elevation of the side moraine over the latter is 70 m.

The northern boundary of the lava area is also marked by a sort of embankment, which is crossed near the top by a lava outflow of the Anei (1779) eruption. At the western point of convergence of the two side elevations there are the traces of at least two craterlets situated about 200 m above sea-level.

The source of the lava outflow which formed the cape of Ōmoe-zaki can clearly be identified with a small round solitary 150 m hill called Maru-yama, which stands near the road between Komen and Krokami. It is much broken up and thickly covered with a pumiceous and ashy material, and gives rise to an U-shaped ridge enclosing a mass of lava continued to the above-mentioned cape. The hamlet of Uranomae occupies a small piece of ground bounded on one side by the Anei lava and on the other by the Bummei lava of Ōmoe-zaki. About 2 km to the S.S.E. of Komen, near the junction of the Krokami and Uranomae roads, there is a sort of "dry lake" or a piece of hollow ground, about $\frac{1}{2}$ km in diameter, which has not been covered by the lava outflows of the two above-mentioned periods.

63. Bummei eruption: south-western craterlets. (I.) *Craterlets of the Earlier Eruption Stage.* The craterlets belonging to the earlier period of the activity on the S.W. side of the island, in the year 1475, are at least five in number and were formed at the lower part of the S.W. side of Minami-dake along a zone, about 800 m in extension, which runs in a N.E. and S.W. direction and approximately coincides with a slope line, the highest and lowest limits being respectively 430 and 220 m above sea-level. (a). The lowest or No. 5 craterlet is a well preserved circular hole situated at the distance of 1.7 km to the N.E. of the village of Yuno. The

upper rim of the slanting mouth, about 100 m in diameter, is at the height of 280 m above sea-level, or 40 m above the bottom area, now converted to a cultivated field. At a few points along the craterlet wall there are exposures of rock masses exhibiting cleavage planes similar to the lavas of the new Arimra and Ushine islets mentioned in Chapter V. 50 m below the No. 5 craterlet there is a small shallow oblong depression with bottom diameters of 40 and 16 m, which may possibly be the site of a small explosive vent. (b.) The higher rim of the craterlet No. 5 is continued to a narrow valley some 80 m in length and 40 m in width, in which the remnants of two small craterlets Nos. 4 and 3 are found, and which apparently constituted a sort of eruption fissure much similar to the one connecting the craterlets Nos. 3, 3′, 3″, and 4′ on the eastern eruption field in the great 1914 outburst. (c.) The craterlet No. 2, with its upper rim 360 m above sea-level, is about 110 m in total length and is in reality composed of two compartments. Of these the posterior one, which is the larger, is a circular hole, with flat bottom 20 m in diameter, and is surrounded by a steep wall 25 m in height. (d.) The highest or No. 1 craterlet, separated by the distance of about 90 m from the upper edge of the No. 2 craterlet, is a large oblong well-preserved hole, whose top is 430 m above sea-level and whose flat pumiceous bottom has the major and minor diameters respectively of 38 and 30 metres. The lower and upper edges of the craterlet wall are respectively 15 and 42 m higher than the bottom plane, the longitudinal extension of the mouth opening being about 116 m. As will be seen from figs. 132 and 133, the higher or N.E. side of the craterlet, whose inclination has an angle of 33°, is crowned by a solid lava arch, 19.4 m in length (chord) and 5.3 m in thickness; the opening beneath being 3.5 m in height. The under surface

of the arch, exposed to about 8 m, is cracked in various direction, but indicates no irregular dislocations. A point of special interest presented by figs. 132 and 133 is their similarity to fig. 49; the arch in question being, like the covering of the compact rocky layers in the case of the recent western No. 1 craterlet (near Hikinohira), nothing else than the surface crust of a previous lava outflow. The settling down of the inner portion of a lava stream naturally produces a more or less extensive underground vacant space, this being probably one of the circumstances which favoured the formation of the western No. 1 explosive craterlets of the Bummei (1475) and Taisho (1914) eruptions actually at their respective localities. (II.) *Second Eruption Stage.* The source of the lava stream, which issued in 1476, and which formed the cape of Moe-zaki at the S.W. end of Sakura-jima seems to be the solitary 180 m hill called Kyono-tsuka (經塚) situated about 1.2 km to the north of the village of Yuno. This is composed of loose lava masses excessively broken up by deep cracks, much resembling the Maru-yama hill lava source of the Ōmoe-zaki outflow on the N.E. eruption field of the Bummei period, the Nakano-shima formed in the Anei (1779) eruption, and the western No. 3 lava source of the 1914 outburst.