

Map showing the Position of the Asama-yama Crater, the Lava Stream of 1783, and of the Neighbouring Places.

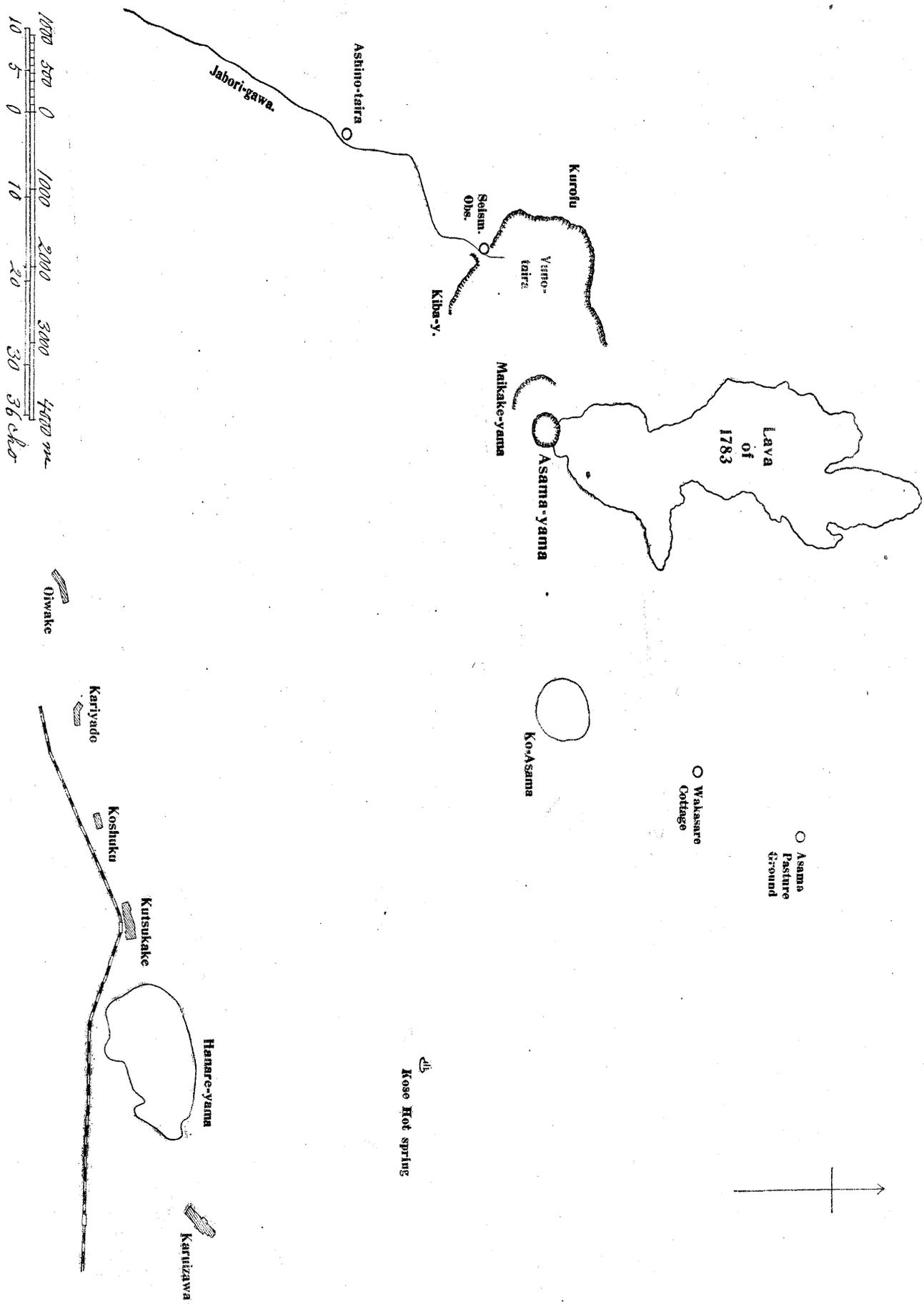
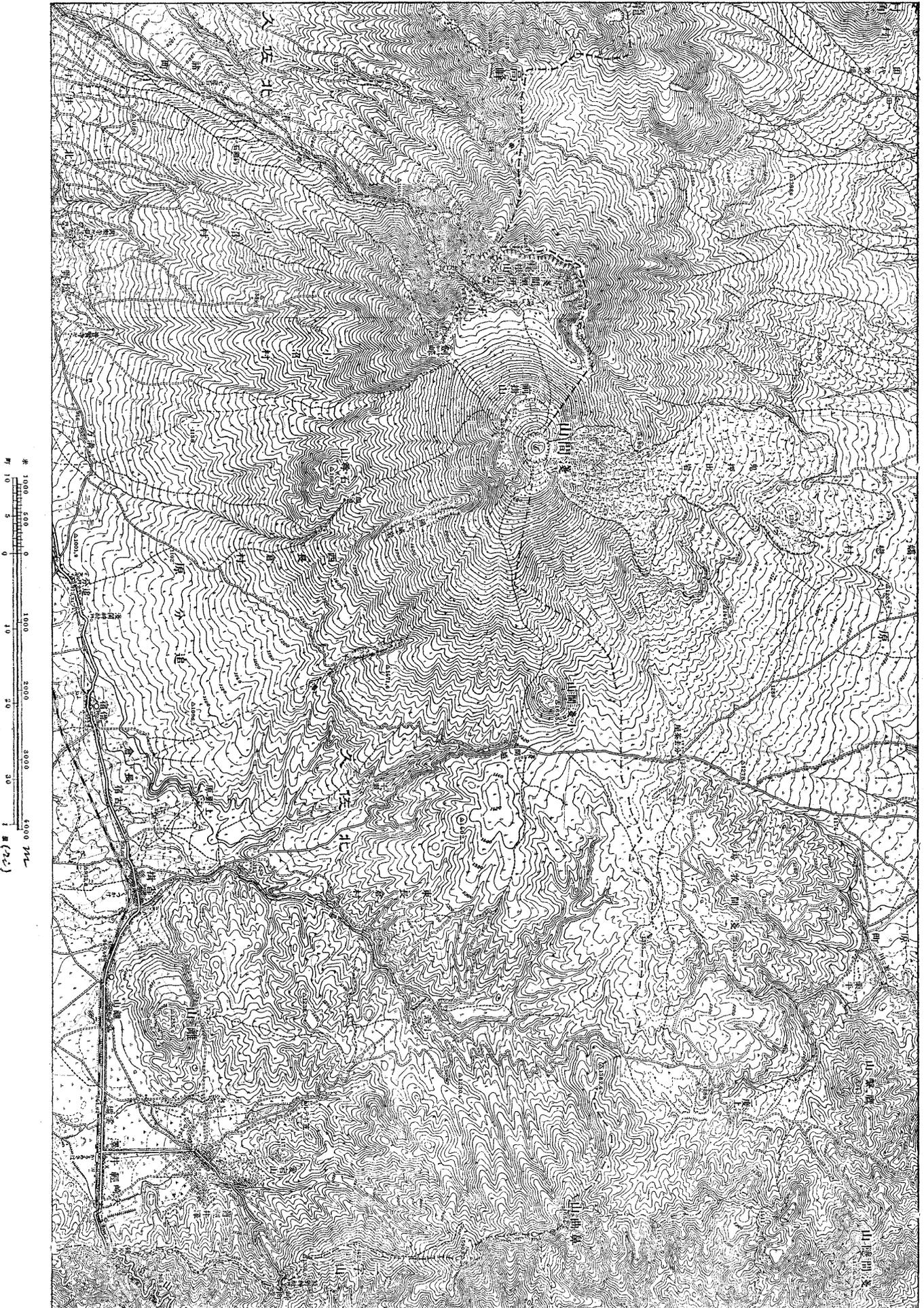


Fig. 1. Map of Asama-yama and the Vicinity.

Pl. XXXV.



THE ERUPTIONS AND EARTHQUAKES OF THE ASAMA-YAMA. VI.

[Notes on the Eruptive and Seismic Disturbances, 1911—1917.]

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With Plates XXXV—LIV.

CHAPTER I. INTRODUCTION.

1. *Military Survey map.* The Military Survey 1/50,000 map of the Asama-yama districts, based on the trigonometrical works executed in 1912, has been published in 1916, the part about the volcano being reproduced in fig. 1. The highest eastern part of the crater rim is 2,542 m. above sea-level, while the height of the top of the Maikake-yama is 2,521 m.

The Yuno-taira seismological observatory is 1955 m. above sea-level and 2.30 km. horizontally distant from the centre of the crater. The "Oni-Oshidashi," or the great lava stream of the 3rd year of the Temmei Period (1783), which flowed down the northern slope of the mountain, stretches northwards to the maximum distance of nearly 5.8 km. from the crater centre. The mean thickness of the lava flow in question, whose area is about 6.8 sq. km., may be assumed to be about 40 m. Then the volume of the "Oni-Oshidashi" lava comes out to be approxi-

mately 0.27 cubic km. The amount of the pumice and ashes thrown out during the eruption in question was some 0.7 cubic km.⁽¹⁾

Comparing the Asama-yama catastrophe of 1783 with the Sakura-jima outburst of 1914,⁽²⁾ we see that the amount of the lava outflow on the former occasion was about one-sixth of that on the latter, the ashes and pumice ejected being nearly equal in volume for the two great eruptions.

2. Survey of the crater.⁽³⁾ In October 1918, Mr. T. Ushiyama, of the Seismological Institute, has executed a survey of the Asama-yama crater and the Maikake-yama. The crater was found to be slightly elliptical, with the major axis in the direction E.S.E.-W.N.W., the rim being highest at the E.S.E. and lowest at the N. part, with the height difference of approximately 47 m. The dimensions relating to the crater were found to be as follows:—

Major diameter of the crater	=	406 m.
Minor diameter	„	= 360 m.
Circumference	„	= 1241 m.
Area	„	= 1.14 sq. km.

The bottom of the crater was at the depth of about 106 m. below the lowest point, or about 153 m. below the highest point of the rim. Thus the lava bottom of the crater has sunk down nearly to the level prior to its marked upheaval at the end of the year 1912.

Immediately after the Temmei (1783) eruption, the volume of the crater, whose bottom was probably some 300 m. below the lowest point of the rim, must have been about 0.12 cubic km.

(1) The Bulletin, Vol. VI, p. 116.

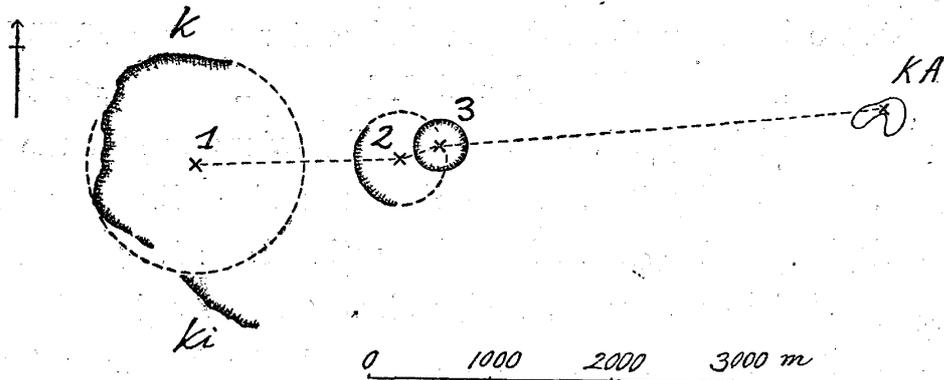
(2) The Bulletin, Vol. VIII.

(3) The figures previously given relating to the dimensions of the crater must be substituted by the more correct numbers stated in this §.

The total volume of the volcanic material ejected during the great Asama-yama disturbance under consideration was, according to § 1, approximately 1 cubic km. or 8 times greater than that of the crater. Such a powerful eruption might possibly have produced a certain depression of the region surrounding the volcano, as exemplified in a grand scale by the Sakura-jima outburst of 1914.

3. Displacement of volcanic vent. The Asama-yama volcano changed its vent three times, evidently weakening its eruptive energy with each transference. As illustrated in fig. 2, the Kurofu-yama continued to the Kiba-yama represents the western half

Fig. 2. Diagram illustrating the Successive Eastward Crater Displacements of the Asama-yama.



1, 2, 3.... Positions of 1st, 2nd, and 3rd Stage Crater Centres respectively.
 K....Kurofu-yama. Ki....Kiba-yama. K.A.....Top of Ko-Asama.

of the 1st stage crater wall, and the Maikake-yama the western remnant of the 2nd stage crater; the present central crater being the 3rd stage vent. The ridge of the Kurofu-yama arc, whose eastern slope extends to the N. E. boundary of the Yuno-taira plain, comes to an end at a point about 1800 m. to the N. 68° W. from the centre of the present crater, thence bending to the S. E. and pointing toward the N. W. slope of the Maikake-yama. Thus the 1st stage crater wall, comprising the Kurofu-yama and the Kiba-yama, does not encircle the Maikake-yama and the present

Asama-yama crater at all. Again, the Maikake-yama crater wall, whose western remnant forms a regular arc, seems, if continued to the N. E., to cross the wall of the central crater, causing the rim of the latter to become thin at the N. side. The approximate dimensions of the three successive craters are as follows:—

1st stage crater (Kurofu-y. and Kiba-y.)	Diameter=1.8 km.
2nd ,, (Maikake-y.)	,, =0.8 ,,
3rd ,, (the present Asama-y.)	,, =0.4 ,,

The line joining the three crater centres and the parasitic cone of the Ko-Asama represents a volcanic chain which runs from the W. slightly S. toward the E. slightly N., and along which the crater displacement took place in the following manner:—

Distance between the 1st and 2nd crater centres=1.75 km.

 ,, 2nd and 3rd ,, =0.40 ,,

The diameters of the 1st, 2nd, and 3rd craters are in the ratios of 4:2:1 approximately, while the successive distances of the centre displacement decreased in the ratio of 4:1. The eruptive energy of the Asama-yama, which thus markedly decreased with its successive crater displacements toward the E., may be supposed to be on the way of a rapid decline, the present crater possibly indicating the last position of the central vent.

4. List of Asama-yama eruptions in 1914. Table I, which forms the continuation of the list given on pages 3 to 6 of the present volume, contains short notes on the 29 eruptions of the Asama-yama during the year 1914, numbered 110 to 138. Of these, the outbursts on Jan. 29th and March 3rd were the strongest. Since 1915 the volcano has become perfectly quiet, there having been no explosion up to March 14th, 1919. Seismic shocks of the volcanic origin, however, continued to disturb the mountain from time to time.

TABLE I. PRINCIPAL ERUPTIONS OF THE ASAMA-YAMA IN 1914.

[The numbers are continued from the lists for the previous years.]

No.	Date.	Time of Occurrence.	Remarks.
110	Jan. 11th.	6 ^h 16 ^m $\frac{1}{2}$ a.m.	{ Detonation heard at Iwamrata, Sannokra, and Maebashi. Sound and ash-precipitation also at Oze (Naka county, Hitachi.)
111	" 12th.	2 $\frac{1}{2}$ — a.m.	{ Sound, heard at Iwamrata and Naganohara, was weaker than on the preceding day. Slight ash-precipitation in vicinity of Karuizawa.
111'	" 13th.	4 $\frac{1}{4}$ — p.m.	{ Emission of black smoke column. Sound like distant thunders heard at Naganohara.
111''	" 23rd.	5 $\frac{1}{4}$ — p.m.	Do. Smoke issue continued till 9 a.m., on 24th.
112	" 26th.	6 45 a.m.	{ Detonation heard at Karuizawa, Iwamrata, Naganohara, and Sannokra, followed by precipitation of sand at Maebashi and that of ashes at Sannokra and Utsunomiya.
112'	" "	4 40 p.m.	{ Smoke emission, causing a very slight ash precipitation at Maebashi.
113	" 27th.	7 20 p.m.	Weak detonation heard at Iwamrata.
114	" "	7 50 p.m.	Do.
115	" 28th.	11 40 p.m.	Detonation heard at Naganohara and Maebashi.
116*	" 29th.	11 52 p.m.	{ Strong explosion, whose detonation was heard at Karuizawa, Komoro, Iwamrata, etc. in Shinano, and in the provinces of Kōtsuke, Echigo, Sado, Etchu, Shimotsuke, Musashi, Hitachi, Shimosā, Uzen, and Rikuzen.
117	Feb. 14th.	1 26 p.m.	Detonation heard in Kōtsuke and Musashi.
118	" 24th.	10 16 p.m.	Detonation heard at Maebashi.
118'	" 26th.	2 45 p.m.	Detonations heard at Naganohara, till 7 ^h 50 ^m p.m.
119	" 27th.	5 27 a.m.	{ Detonations heard at Maebashi, till 6 ^h 04 ^m a.m. There was ash-precipitation at Kumagai and neighbouring places between 5 and 9 a.m.
119'	" 28th.	2 — a.m.	Weak sound heard at Maebashi.
120*	March 3rd.	9 50 p.m.	{ Strong explosion, whose detonation was heard at several places in Shinano, Kōtsuke, and Mino. At Karuizawa, some doors and shōjis were overthrown by the air shocks.
121	" 14th.	7 56 a.m.	{ Detonation heard at Iwamrata, Nagano, and Maebashi.
122	" 15th.	1 — a.m.	{ Detonation heard at Karuizawa, Kumagai, and a few places in Kōtsuke.

No.	Date.	Time of Occurrence.	Remarks.
123	March 23rd.	^h 7 ^m 40 a.m.	{ Detonation heard at Karuizawa, Kumagai, and a few places in Kōtsuke.
124	„ 25th.	2 36 a.m.	{ Detonation heard at Kumagai and a few places in Kōtsuke.
125	„ 30th.	10 10 a.m.	{ At Naganohara, a detonation followed by ash precipitation.
126*	April 6th.	7 27 p.m.	{ Strong detonation was heard at the different places in K. Saku county (Shinano), in the province of Kōtsuke, and at Kumagai. The sound was noticed also at Nagano, and in the vicinity of Yokohama.
127	„ 9th.	8 51 a.m.	{ Detonation heard in K. and S. Saku counties (Shinano), and at Maebashi and Naganohara.
128	May 5th.	0 34 a.m.	{ Detonation heard in K. and M. Saku counties (Shinano), and at a few places in Kōtsuke. Also perceived in Tokyo.
129	„ 9th.	4 07 p.m.	{ Detonation heard at Naganohara, Maebashi, and Sannokra.
130	„ 19th.	6 — p.m.	Detonation heard at Naganohara.
131	June 24th.	2 05 p.m.	Smoke emission observed from Nagano.
132	Nov. 12th.	8 50 a.m.	{ Detonation heard at Iwamrata, Komoro, etc., with an ash precipitation at Shibukawa (Kōtsuke).
133	„ 12th.	8 35 p.m.	Detonation heard at Shibukawa and Hanageishi.
134	„ 15th.	11 24 a.m.	{ Loud detonation heard at Kamisuwa, Komoro Naganohara, Usuta, and Kumagai. In Tokyo the tromometers registered the vibrations due to the explosion.
135	„ 16th.	7 27 p.m.	Detonation heard at Karuizawa.
136	Dec. 14th.	3 33 p.m.	{ Sound heard at Maebashi, with ash precipitation at Kumagai and vicinity.
137	„ 15th.	0 50 a.m.	{ Detonation heard in the S. W. part of Kazusa and also at several places in the province of Mino.
138	„ 16th.	7 — a.m.	Explosive sound heard at several places in Mino.

[No further eruption of the Asama-yama till March 14th, 1919.]

* Strong explosion. Numbers 111', 111'', 112', 118', and 119' were slight disturbances.