

CHAPTER II. LISTS OF THE ERUPTIONS OF
THE ASAMA-YAMA.

7. List of Asama-yama eruptions in historical times. Table I gives the list of the eruptions of the Asama-yama during the twelve hundred years between 685 and 1889, which has been compiled chiefly from the following three works:— (i), “Dai Nippon Jishin Shiryo,” or, Materials for the Earthquake History of Japan, *the Reports* (Japanese) of the *Imperial Earthquake Investigation Committee*, No, 46; (ii), the late Mr. Ogashima’s “Nippon Saiishi,” or, A History of the Unusual Natural Events in Japan; (iii), the “Asama-yama,” a collection of the informations regarding the Asama-yama, published by the Komoro Elementary School.

TABLE I. LIST OF THE ERUPTIONS OF THE ASAMA-YAMA
DURING THE HISTORICAL TIMES. (685—1889.)

Group.	No.	Date.	Remarks.
	1	April, 685.	Eruption of fires and ashes, destroying vegetation.
	2	Aug.-Oct., 1108.	{Eruption of fires, stones, sands, and ashes, burying the cultivated fields for about 18 miles. The detonations were heard in the different provinces.
I	3	May, 1527.	Eruption, throwing out stones and sands.
	4	1528.	Eruption.
	5	1532.	Do.
II	6	May 1-5, 1596.	Eruption throwing out stones and killing people.
	7	Aug. 19, 1596.	Eruption.
	8	1598.	Do.
	9	Dec. 1605.	Eruption, lasting over a month.

Group.	No.	Date.	Remarks.	
III	10	Feb. 20, 1644.	Eruption.	
	11	Feb. 24, 1645.	Do.	
	12	May 21, „	Do.	
	13	Feb. 18, 1647.	Do.	
	14	March 25, „	Do.	
	15	March 22, 1648.	Eruption at about 8 am.	
	16	Aug. 29, „	Eruption.	
	17	Aug. 17, 1649.	Do.	
	18	April 12, 1651.	Do.	
	19	April 12, 1652.	Do.	
	20	Nov. 25, 1655.	Do.	
	21	Dec. 10, 1656.	Detonation and eruption at 6 am.	
	22	Nov. 25, 1657.	Eruption.	
	23	July 24, 1658.	Do.	
	24	July 24, 1659.	Detonation and eruption at 6 am.	
	25	April 8, 1660.	Eruption.	
	26	April 14, 1661.	Do.	
	27	April 27, „	Do.	
	28	Oct. 21, „	Do.	
	29	1669.	Do.	
	IV	30	Feb. 5, 1704.	Eruption, lasting several days.
		31	Nov. 20, 1706.	Eruption.
		32	Dec. 29, 1708.	Eruption; ashes fell in Yedo (Tokyo).
		33	April 13, 1710.	Eruption.
		34	April 12, 1711.	{ Eruption at 11 am, lasting for one hour. Ashes { accumulated 1 inch.
		35	Sept. 23, 1717.	Eruption.
		36	Sept. 26, 1718.	{ Eruption, fire bombs rolled down the S. slope of { the Maikake-yama.
		37	June 6, 1720.	Eruption.
		38	June 22, 1721.	{ Eruption, at about noon, killing 15 travellers and { wounding 1.

Group.	No.	Date.	Remarks.
IV	39	1722.	Eruption.
	40	Feb. 5, 1723.	Do.
	41	Aug. 20, „	Do.
	42	Nov. 10, 1728.	Do.
	43	Nov. 1729.	Do.
	44	July 30, 1732.	Do.
	45	July 30, 1733.	{ Eruption during the night, the Kurof-yama being covered by the fires. The Maikake-yama was cracked at several places to the width of 5 to 15 inches. Stones fell as far as the Yuno-taira.
V	46	Aug. 7, 1754.	Eruption, throwing out ashes.
	47	Aug. 19, „	Do.
	48	Sept. 5, 1776.	Eruption at 10 pm.
	49	1777.	Several eruptions.
	50	May 9-Aug. 5, 1783.	Great Temmei Catastrophe. (Chapter VIII.)
	51	July 4, 1803.	{ Eruption; sands fell to a distance of 5 km on the N. side.
	52	Nov. 7, „	{ Eruption during the night, throwing out large stones by which the Wakasare cottage at the base of the Ko-Asama was crushed down.
	53	Nov. 20, „	{ Eruption from 4 am, small stones and sands being thrown out till 7 am; ashes fell also in Yedo.
	54	Feb. 28, 1815.	{ Eruption at 11 pm, small stones and sands falling down for half an hour, towards Itahana, in Kotsuke.
	55	1866.	Eruption.
	56	1869.	Several eruptions.
	57	June 14, 1875.	Eruption in the morning, throwing out ashes.
	58	Sept. 27, 1879.	{ Eruption at 10 am. There were eruptions also on the 28th.
	59	1889.	Eruption.

Of the different eruptions tabulated above, Nos. 1 to 59, the greatest was that in the 3rd year of the Temmei period, 1783, (No. 50), and with regards to this maximum display of the volcanic

activity, the previous outbursts may be taken as indicating a periodicity more or less definitely. Thus, leaving Nos. 1 and 2 out of consideration on account of the obvious incompleteness of the historical records before the 16th century, the 48 eruptions, Nos. 3 to 50, may be divided into five groups, I to V; the time intervals of absolute rest between the successive groups being respectively 64; 39; 35; and 21 years. In the following table are indicated the mean epochs of the different groups, with the successive time differences; only the group V being supposed to be represented solely by the great Temmei catastrophe, No. 50.

TABLE II. ASAMA-YAMA ERUPTIONS IN HISTORICAL TIMES DIVIDED INTO GROUPS.

Group.	Number of Eruptions.	Mean Epoch (year).	Successive Difference.
I	3	1529 A.C.	
II	4	1599 70 years.
III	20	1654 55
IV	16	1719 65
V	Temmei Eruption.	1783 64
<i>Mean</i>	—	—	63½

Thus the successive differences between the mean epochs of the volcanic activity varied from 55 to 70 years, giving the average interval of about 63 years. After the great Temmei (1783) outburst, the Asama-yama was very quiet, until the activity has revived with great intensity since the year 1909. The time

difference between the latter and 1783 is 126 years, which happens to be double the average interval above obtained. It may be possible that 63 years is the length of the predominating or fundamental period in the frequency of the explosions, or in the activity of the volcanic manifestations, of the Asama-yama.

8. Number of eruptions in 1894-1909. The total number of the eruptions of the Asama-yama, reported from the different places during the 16 years between 1894 and 1909, were 40, as follows :—

TABLE III. YEARLY NUMBER OF THE ERUPTIONS OF THE ASAMA-YAMA, 1894—1909.

Year.	Number of Eruptions.	Year.	Number of Eruptions.
1894	6	1902	1
1895	0	1903	0
1896	0	1904	1
1897	0	1905	0
1898	0	1906	1
1899	4	1907	3
1900	7	1908	5
1901	6	1909	9

Thus, in the recent times, previous to 1909, the Asama-yama was much active in the years 1894, 1900, 1901, and 1908.

9. Annual variation of frequency of eruptions. The distribution in the different months of the year of the Asama-yama eruptions in 685-1889 and in 1894-1909 (§§ 7 and 8) is indicated in the following table :—

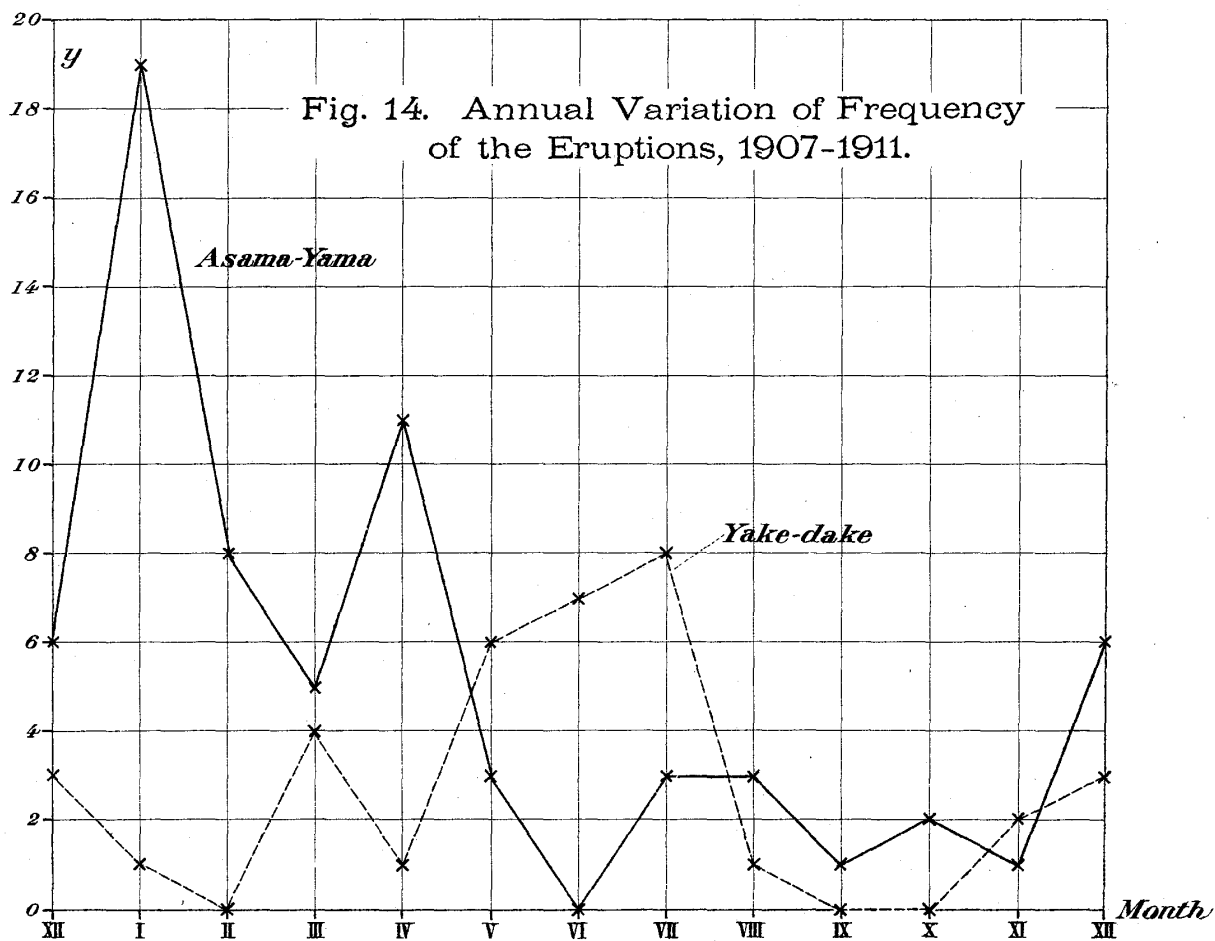
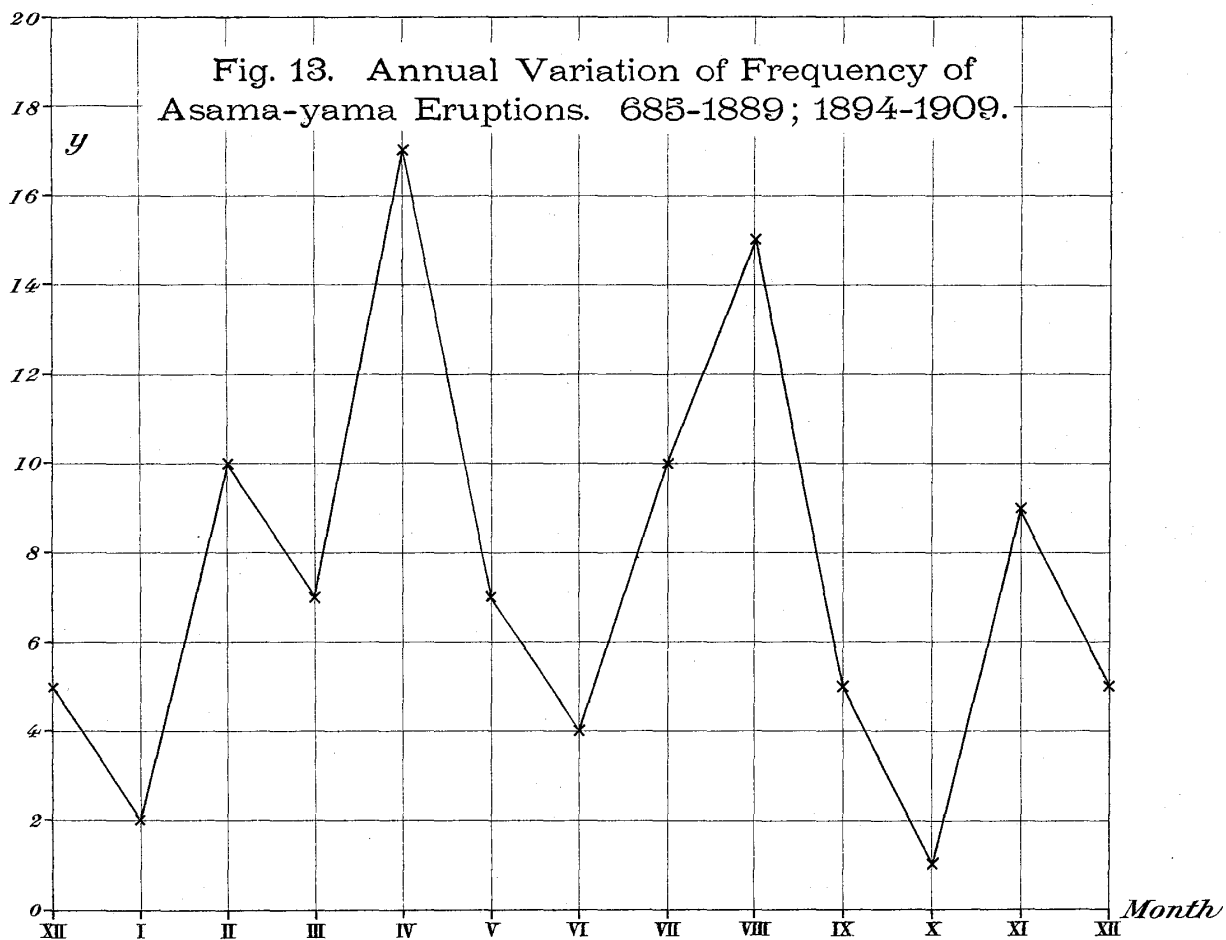
TABLE IV. ANNUAL VARIATION OF THE FREQUENCY OF THE
ASAMA-YAMA ERUPTIONS.

685—1889; 1894—1909.

Month.	(i) Historical Times, 685—1889.*	(ii) 1894—1909	(iii) Sum.
January.	0	2	2
February.	6	4	10
March.	2	5	7
April.	8	9	17
May.	3	4	7
June.	3	1	4
July.	5	5	10
August.	7	8	15
September.	4	1	5
October.	1	0	1
November.	7	2	9
December.	3	2	5
<i>Sum.</i>	49	43	92

* The Temmei catastrophe in 1783 has been omitted, as the eruptions lasted from May to August.

The annual distributions (i and ii) of the eruptions in the two intervals of 685—1889 and of 1894—1909 are mutually similar. According to (iii), which gives the results obtained by taking together these two series of the disturbances, the maximum frequency occurred in April and also in August. (See Fig. 13.) In the latter month, which belongs to the epoch of the minimum barometric pressure in the year, also occurred the final great convulsions of the Temmei catastrophe. It may be added that the snow thickly accu-



y = Monthly Number of Eruptions.

mulating in the north-western part of Japan is largely melted in April, which fact may have some connection with the increase of the volcanic activity in the latter month.

10. Recent activity of Asama-yama. The Asama-yama, whose activity considerably increased in the recent years, made, especially since 1909, numerous eruptions, several of which were powerful explosions; there being also frequent earthquakes, which originated at, or quite near to, the volcano. The greatest among these seismic disturbances was the earthquake on May 26th, 1908, at 9.18 am, which shook strongly the Kita-Saku district at the south base of the Asama-yama, and whose motion was sensible at Nagano, Matsumoto, Niigata, Yokohama, and Tokyo, at distances respectively of 40, 53, 175, 147, and 137 km from the mountain. (See also § 4.) As shown in Figs. 36 and 37, the seismographs in the Seismological Institute (Hongo, Tokyo) gave large diagrams of this shock, the maximum EW component motion amounting to 2.1 mm. The earthquake in question evidently originated at the Asama-yama itself and shook down rock fragments from the middle part of the Kiba-yama and the top of the Tsurigane-iwa (Bell Rock) of the Kurofu-yama, and from the cliff wall of the Maikake-yama; while it produced several cracks, 10 to 20 metres in length and 3 centimetres in width, around the crater, giving much alarm to the inhabitants of the neighbouring districts, who feared that this circumstance might lead to the falling down of parts of the crater wall and a subsequent strong explosion. In the course of the next year, 1909, there were, in May, eight local shocks in the districts about the city of Matsumoto, and a strong outburst of the Asama-yama (on the 31st); in June, more than 10 moderate and slight shocks of the Asama-yama origin; in October, one moderate and six slight

shocks, at the boundary districts of the two provinces of Shinano and Kotsuke; while on Sept. 12th, at 7.35 pm, the Shikazawa spa and the vicinity, in the Tsumagoi-mura, situated at the north base of the Asama-yama, were shaken in the course of half an hour by seven earthquakes, one of which was severe, causing the stoppage of pendulum clocks and overthrow of articles from shelves. Finally, in Dec. 1909, the town of Ueda, about 24 km to the west of the Asama-yama, was shaken, on the 2nd, by two slight earthquakes in the morning and by a strong vertical motion shock at 9.57 pm which caused the people to run out of doors, and which was followed by a slight shaking at 11 pm. On the next day, the 3rd, a shock was felt at 3.50 pm, in the Sarashina district, to the NW from Ueda. At the latter town there were again, on the 5th and 6th, felt six small earthquakes, namely, at 5.35, 8.20, and 10.00 pm on the 5th; and at 2.45, 3.12, and 4.40 am, on the 6th. On the day following the latter, the 7th, a strong outburst of the Asama-yama took place at 7.45.07 pm. As will be seen from Table V, thereafter the eruptions of the volcano became very frequent.

11. *List of recent eruptions of Asama-yama.* Table V gives a list of the sixty-two eruptions of the Asama-yama, which occurred in the course of the four years, 1908 to 1911, and whose detonation or emission of ashes were intense enough to be noticed in the neighbouring provinces or at places outside the immediate foot of the mountain.

TABLE V. LIST OF THE 62 ERUPTIONS OF THE ASAMA-YAMA DURING THE YEARS. 1908-1911.

No.	Date.	Time of Occurrence (at Asama-yama).	Remarks.
1	1908. Feb. 13	(Evening.)	Explosions.
2	" 19	11 — — pm.	{ Detonations; ashes fell at Komoro and other places.
3	Aug. 5	3 — — am.	Detonation and explosion.
4	" 16	8 — — pm.	Explosion.
5	Sept. 21	————	{ Several detonations on 21st-23rd; ashes fell at Komoro.
6	1909. Jan. 29	5 — — pm.	{ Strong outburst, whose detonation caused some damage at Iwamura, Komoro, Miyota, etc.
7	Feb. 2	Between 2 & 3 pm.	Detonations.
8	April 2	7 — — am.	Ashes fell at Takasaki and Maebashi.
9	May 31	11 25 — pm.	{ Strong outburst, which threw out a considerable quantity of stones. Ashes fell at several places.
10	July 6	Between 8 & 10 am.	Ashes fell in Shimotsuke and Hitachi.
11	Aug. 21	6 — — pm.	Detonations.
12	Dec. 7.	7 45 07 pm.	{ Strong eruption, putting forests on fire. Ashes reached to the Pacific coast, while the detonation was heard as far as Sendai and the E. part of Mino.
13	1910. Feb. 12.	2 — — am.	{ Ashes fell at Karuizaza, and in Kotsuke and Musashi.
14	May 2	9 — — "	Detonation.
15	July 5	10 50 — "	Do.
16	" 11	11 — — pm.	Ashes thrown out.
17	Oct. 21	3 30 — "	Detonation.
18	Nov. 7	(Whole day)	Continuous detonations.
19	Dec. 2	8 20 36 pm.	{ Strong eruption. Sound area slightly smaller than in No. 12. Ashes reached only to the vicinity of Tochigi.
20	" 15	5 01 — "	{ Sound heard to radial distance of 140 km toward the ESE.
21	" 16	8 05 — am.	{ Sound heard to radial distance of 185 km toward the E.
22	" 25	8 45 30 pm.	{ Sound heard in Echigo, Kotsuke, Musashi, and Kai; and also in Hida and Etchu; but nowhere in Shinano.
23	1911. Jan. 3	2 — — "	{ Ashes fell in Saitama, Chiba, and Ibaraki districts.

No.	Date.	Time of Occurrence (at Asama-yama).	Remarks.
24	1911. Jan. 6	1 ^h 07 ^m — ^s am.	{Ashes fell in Saitama district. Detonation was heard also in Etchu.
25	„ 16	8 — — „	Detonation, accompanied by ejection of ashes.
26	„ 17	2 04 25 „	Detonation; ashes fell at Karuizawa.
27	„ „	1 — — pm.	Do.
28	„ „	(Night).	Slight amount of ashes fell at Kumagai.
29	„ 18	1 30 — pm.	Ashes fell at Maebashi and Utsunomiya.
30	„ „	5 20 58 „	{Ashes fell at Maebashi. Detonation was heard to a distance of 125 km, toward the ESE.
31	„ „	9 27 49 „	{Ashes fell at Utsunomiya. Detonation was heard to a distance of 180 km toward the E.
32	„ 19	1 15 18 am.	Detonation and explosion.
33	„ „	9 47 — „	Do. (accompanied by some flames).
34	„ „	2 17 45 pm.	Do.
35	„ 20	0 47 — „	Ashes thrown out.
36	„ 21	6 — — am.	Ashes fell at Iino (Saitama prefecture).
37	„ „	0 16 35 pm.	Explosion; detonation was heard at Maebashi.
38	„ 22	4 — — „	{Detonation; slight amount of ashes fell at Maebashi.
39	„ 23	4 16 — „	Do.
40	„ „	9 27 14 „	{Detonation and explosion, accompanied by flames. Ashes fell at Maebashi and Takasaki.
41	Feb. 4	(Whole day).	{Detonations and explosions; ashes fell at Naganohara, Kumagai, etc.
42	„ 6	8 30 — pm.	Detonations heard at Maebashi and Takasaki.
43	„ 10	5 30 — am.	Detonation heard at Takasaki.
44	„ 13	10 25 — pm.	Several detonations; ashes fell at Maebashi.
45	March 21	2 46 — am.	Detonation and explosion.
46	„ „	9 10 30 „	Great detonation; ashes fell in Saitama districts.
47	„ 22	(In afternoon).	Several small explosions.
48	„ 24	11 55 — pm.	Small explosion.
49	„ 25	11 03 30 „	Detonation; ashes thrown out.
50	April 2	9 50 — „	Detonation.

No.	Date.	Time of Occurrence (at Asama-yama).	Remarks.
51	1911. April 2	10 ^h 20 ^m — ^s pm.	Detonation.
52	„ 3	1 52 30 „	Detonation (heard also in Etchu).
53	„ 4	8 42 ? am.	Do. (Do.).
54	„ 7	3 40 — „	Detonation heard at Maebashi.
55	„ 8	1 — — pm.	Ashes fell at Maebashi and Kumagai.
56	„ 9	10 — — am.	Slight amount of ashes fell at Maebashi.
57	„ 11	8 12 — „	Great detonation.
58	„ 13	2 — — „	Slight amount of ashes fell at Maebashi.
59	„ 16	4 40 — pm.	„ „ „ „ Kumagai.
60	May 8	3 27 58 „	{ Strong explosion which threw out a large quantity of stone fragments.
61	Oct. 22	3 46 04 am.	{ Strong explosion; the sound-area extended chiefly toward NE along the Shinano-gawa valley, to the radial distance of 205 km.
62	Dec. 3	3 16 — „	{ Strong detonation, emitting smokes and fires. The sound was heard also in Etchu.

According to the above table, the successive monthly numbers of the eruptions were as follows:—

TABLE VI. MONTHLY NUMBER OF THE ASAMA-YAMA ERUPTIONS, 1908—1911.

Year. Month.	1908	1909	1910	1911
January.	—	1	—	18
February.	2	1	1	4
March.	—	—	—	5
April.	—	1	—	10
May.	—	1	1	1
June.	—	1	—	—

Year. Month.	1908.	1909.	1910.	1911.
July.	—	—	2	—
August.	2	1	—	—
September.	1	—	—	—
October.	—	—	1	1
November.	—	—	1	0
December.	—	1	4	1

Thus the greatest number of the eruptions occurred from December 1910 to April 1911; the strongest among these being the following four :—

- No. 9. May 31st, 1909; 11. 25. 00^{h m s} pm.
 No. 12. Dec. 7th, „ ; 7. 45. 07 pm.
 No. 19. Dec. 2nd, 1910; 8. 20. 36 pm.
 No. 60. May 8th, 1911; 3. 20. 00 pm.

The 62 eruptions tabulated above may be regarded as being the larger among the disturbances of the Asama-yama, which happened in the time interval under consideration. Had the crater been watched carefully from an immediate neighbourhood, would there naturally have been also a great number of the minor outbursts, which failed entirely to be observed beyond a very short distance. I give in Table VII the records respecting the detonations and eruptions of the Asama-yama observed, between July 1909 and Dec. 1911, by the innkeeper, Mr. Tsuchiya, of the Wakasare cottage at the foot of the Ko-Asama, about 4 km to the NNE of the crater.

TABLE VII. LIST OF THE DETONATIONS AND EXPLOSIONS OF
THE ASAMA-YAMA RECORDED AT THE WAKASARE
COTTAGE. JULY, 1909—Dec. 1911.

Date.	Approximate Time of Occurrence.	Remarks.
1909. July 6	4 ^h 40 ^m am.	{Detonation, followed by projection of ashes and small stones.
Aug. 18	4 — "	{Detonation and explosion. [There was an earthquake on Aug. 14th, at 3.25 pm.]
Sept. 23	4 30 pm.	{Eruption. [There was an earthquake on Sept. 12th, at 7.45 pm.]
Nov. 16	5 20 "	Detonation and explosion.
" 25	2 07 am.	Detonation.
" "	3 10 "	Do.
" "	3 25 "	{Detonation, followed for 15 minutes, by precipitation of sands, and stones of maximum dimension of about 5 inches. At 3.40 am there was a sound probably due to the falling down of a part of the crater wall.
Dec. 5	1 — pm.	Ashes thrown out.
" 7	7 45 "	Strong eruption.
" 15	1 — "	{Detonation, followed by thick precipitation of ashes and sands as large as peas.
" 31	11 40 "	Detonation, projecting rock fragments to the N base.
1910. Jan. 9	6 31 am.	Detonation; sands and small stones thrown out.
Feb. 12	6 — "	{Smoke explosions accompanied by sounds like thunders, which continued till 12 pm.
April 2	8 25 pm.	Detonation, followed by projection of stones to the N base.
" 13	5 40 "	Detonation; ashes fell.
" 16	7 45 am.	Do.
" 24	7 45 pm.	Detonation; large stone fragments thrown out.
" 25	5 45 am.	Detonation.
May 7	8 30 "	{A strong earthquake accompanied by an explosion. This was preceded by another strong shock at 8.10 am and followed by five smaller ones in the course of the day.
June 25	9 30 "	{Loud detonation; large stone fragments thrown out especially towards the SW base.
" 27	— —	Detonations continued throughout the day.
July 4	10 30 "	Loud detonation.
Sept. 24	2 30 pm.	{Some precipitation of ashes. [On Sept. 6, an earthquake at 2.40 pm.]

Date.	Approximate Time of Occurrence.	Remarks.
Oct. 21	4 ^h 28 ^m pm.	Loud detonation.
Nov. 10	9 20 am.	Strong explosion.
Dec. 2	8 20 pm.	{ Strong explosion, throwing out stones about 3 inches in dimension toward the east.
„ 15	5 15 „	Explosion.
„ 16	8 20 am.	{ Loud detonation like thunders, followed 20 minutes after by the precipitation of small stones.
„ 25	9 10 pm.	Strong explosion; sands were thrown down.
1911.		
Jan. 3	2 30 „	Detonation and explosion.
„ „	5 — „	Precipitation of white pumice-like sands.
„ 8	4 40 am.	Detonation.
„ 18	5 35 pm.	Two detonations and strong explosion.
„ 19	7 34 am.	Explosion; sands and small stones fell.
„ „	8 30 „	Do.
„ „	9 50 „	Do.
„ „	2 35 pm.	Do.
„ „	7 20 „	Do.
„ 22	11 50 „	{ Strong explosion, ashes and large stone fragments fell at the E base of the mountain.
„ 23	2 15 „	Explosion.
„ „	3 40 „	{ Strong explosion: large stones thrown towards the north, sands and small stones falling towards the E.
„ 24	5 30 „	Detonation.
„ 25	9 — am.	Detonation and explosion.
Feb. 4	10 — „	Detonation and explosion, ashes falling till 5 pm.
March 15	— —	{ Detonation and explosion attended by the precipitation of sands.
„ 16	1 — pm.	{ Since 1 pm, detonations attended by precipitation of ashes as was the case also on the 17th, 18th, and 19th.
„ 21	4 10 am.	Earthquake accompanied by a loud detonation.
„ „	10 10 „	{ Loud detonation and explosion; stones were thrown northwards with sounds like thunders.
„ „	4 15 pm.	{ Strong explosion, sands and small stones falling down at the east side for 1 hour.
„ 22	3 20 „	Detonation and explosion, sands falling down.
„ 23	— —	Some fall of sands.
April 3	2 05 „	{ Loud detonation and explosion, stones being thrown down at the N side. [There were strong earthquakes on the 2nd, at 10.40 pm; and on the 3rd, at 9.40 pm.]

Date.	Approximate Time of Occurrence.	Remarks.
1911. April 4	8 ^h 50 ^m am.	{Loud detonation and strong explosion, stones being thrown toward the NW. Sands and ashes fell at the Mihara mura.
„ 6	3 40 „	Loud detonation.
„ 8	11 30 „	{Detonation; ashes, sands, and small stones 1 cm in dimension, falling down for about 30 minutes.
„ 11	8 17 „	{Loud detonation, large stones being thrown to the N side. {The sound continued till 9.40 am.
„ 12	5 30 „	{Stones, 3 cm in dimension, fell down. [There were earthquakes on the 17th, at 1.29 pm; and on the 19th, at 11.40 am.]
May 8	3 30 pm.	Loud detonation.
„ „	6 30 „	Explosion, ashes and sands falling down thickly.
„ 9	— —	Strong explosions, stones falling down.
June 7	— —	Detonations.
July 8	— —	Detonations continued from the noon till 9 pm.
„ 9	— —	Detonations.
„ 15	— —	{Detonations from 7 pm, continued till the next morning. { [There were earthquakes on the 24th, at 5.34 am and 9.40 am].
Aug. 19	— —	Some precipitation of sands.
Oct. 22	3 40 am.	{Loud detonation. [There was an earthquake on Nov. 15th at 6.40 pm].
Dec. 2	3 05 „	Loud detonation.

As will be seen from the above table, the precipitation of ashes, sands, and small stones took place frequently at the Wakasare cottage, there having been between July 1909 and Dec. 1911, sixty-seven cases of the disturbances against the fifty-three during the same interval observed at more or less distant places (Table V). From the Wakasare observations, we see that the strong eruption of Dec. 7th, 1909, was preceded by one outburst on the 5th of the same month, and four on the 16th and 25th of the previous month.

Although the eruptions of the Asama-yama were recently so frequent, they caused no casualty till May 8th, 1911, when, as is

customary every year the opening ceremony for the ascent of the volcano was performed. A number among the numerous visitors, who then ascended the mountain, met the strong explosion at 3.28 pm, on the afternoon, one man being killed by the falling stones at the edge of the crater; the four men, who afterwards went to the mountain top in search of this missing person, met themselves an explosion at 6½ pm, on the same day, which threw out stones, one of them being thereby slightly wounded, while another was severely injured and died subsequently. Another disaster took place on Aug. 15th, 1911, the day of festival of the Asama shrine, when, according to an old habit, numerous travellers and pilgrims had ascended the mountain during the early morning in order to witness the sun-rising from the top. Unfortunately an explosion occurred at about 4.43 am, in the same morning, which projected out stones and killed a police constable and an American missionary, who happened then to be sitting at the crater edge; there being also 6 foreigners and 14 Japanese who were more or less seriously wounded. This explosion was, however, a quite small outburst, and its detonation was not perceived even at the Wakasare cottage.

12. *Relation of activity of Asama-yama to that of others.*

The recent activity of the Asama-yama is evidently the result of the growth of stress in the earth's crust, which was not limited only to the immediate vicinity of the volcano in question. Thus, the Yake-dake, which is on the boundary between the two provinces of Shinano and Hida, about 85 km to the west of the Asama-yama, became active since Dec. 1907, and made numerous explosions which occurred in striking alternations with those of the Asama-yama. (See Chapter VII.) Again, in Hokkaido (Island of Yezo) there were remarkable eruptions of the Tarumai-san and

the Usu-san which took place respectively in Jan. to April, 1909, and in July to Aug., 1910.

13. Diurnal distribution of explosions of Asama-yama.
The diurnal distribution of the explosions of the Asama-yama between 1908 and 1911, (Table V), is as follows:—

TABLE VIII. DIURNAL DISTRIBUTION OF THE 54 EXPLOSIONS OF THE ASAMA-YAMA.

Hour.	Hourly Number of Explosions.	
	A.M.	P.M.
0—1	0	2
1—2	2	4
2—3	4	3
3—4	4	2
4—5	0	3
5—6	1	3
6—7	1	1
7—8	1	1
8—9	4	4
9—10	3	3
10—11	2	2
11—12	0	5
<i>Sum</i>	22	32

Although the data at our disposal is too scanty to admit of any satisfactory discussion on their diurnal variation, the above table shows more or less definitely, as illustrated in Fig. 15, four maxima and four minima in the frequency of the explosions; the maxima occurring at 2—3 am, 8—9 am, 1—6 pm, and 8—12 pm, and the minima at 0—1 am, 4—5 am, 0—1 pm, and 6—8 pm.

The diurnal distribution of the Asama-yama explosions above considered is similar to those of the earth-sounds at Arima and of the earthquakes instrumentally observed in Tokyo, as discussed in the *Bulletin*, Vol. II, No. 2, indicating the maximum frequencies approximately at the hours of the maxima as well as of the minima in the diurnal variation of the barometric pressure. (Compare Fig. 15 with Figs. 16 and 17.)

CHAPTER III. NOTES ON THE ERUPTIONS OF THE ASAMA-YAMA, 1908-1911.

14. In the following §§, I give a short descriptive notes on the eruptions of the Asama-yama, between 1908 and 1911, which have been enumerated in Table V, the discussions on the sound and ash-precipitation areas and the repetitions and the velocity of the detonations being given in Chapters IV, V, and VI.

15. *Eruptions in 1908.*

(1) Feb. 13th, 1908. Toward the evening, there were several large smoke emissions, the Asama-yama continuing in activity during the succeeding days. On the 15th, ashes fell at the town of Annaka 35 km to the ESE of the volcano.

(2) Feb. 19th, 1908; 11 pm. Detonations, followed, till the next morning, by the precipitation of ashes at Komoro and other places at the base of the mountain.

(3) Aug. 5th, 1908; 3 am. Detonation and explosion.

(4) Aug. 16th, 1908; 8 pm. Explosion.

(5) Sept. 21st, 22nd and 23rd, 1908. At Maebashi there was in the morning of the 21st and during the night of the 22nd a precipitation of ashes mixed with the rains which were then falling. At Komoro, the detonations were heard during the night of the 21st and in the morning of the 23rd.