

the same direction. In earthquakes of Group VIII B, however, the direction was oftener toward W than toward E. These facts seem to indicate that the direction of the first displacement of the principal portion at a given station is generally determined by the position of the seismic origin with respect to the latter, or that those earthquakes originating from a given centre or focus are generally caused by similar subterranean disturbances.

IX. Duration of the Preliminary Tremor in the Earthquakes of Groups VIII A and VIII B.

§ 14. In the macro-seismic disturbances of near origin, or the earthquakes of Group VIII A, the duration of the total preliminary tremor varied, with a few exceptions, between 3 and 17 sec.; those most frequently occurring being from 6 to 11 sec. The frequency of the different cases was as follows.—

TABLE XXIV.

DURATION OF THE PRELIMINARY TREMOR. [EARTHQUAKES OF GROUP VIII A.]

Duration of total preliminary tremor.	Number of cases.	Duration of total preliminary tremor.	Number of cases.
3 sec.	1	13 sec.	2
4	2	14	4
5	1	15	2
6	9	16	2
7	5	17	2
8	5	18	1
9	3	19	1
10	4	22	1
11	6	29	1
12	3		

Again, in cases of the local *unfelt* earthquakes, or those of Group VIII B, the duration of the total preliminary tremor varied, with a few exceptions, between $2\frac{4}{10}$ and 25 sec.; the frequencies of the different cases being as follows.—

TABLE XXV.

DURATION OF THE PRELIMINARY TREMOR.
[EARTHQUAKES OF GROUP VIII B.]

Duration of total prel. tremor.	Number of cases.	Duration of total prel. tremor.	Number of cases.
sec. $2\frac{4}{10}$	1	sec. 16	4
5	2	17	1
6	2	18	2
7	1	19	1
8	1	21	2
9	2	22	2
10	2	24	1
11	1	25	2
12	4	28	1
13	1	33	1
14	2	37	1
15	2	58	1

The data contained in the above two tables will be of use in the estimation of the focal depth of the local earthquakes.

**X. Annual Distribution of the Earthquakes of
Groups VIII A and VIII B.**

§ 15. The small local earthquakes, namely, those of Group VIII A and VIII B occurred much more frequently in the summer months than in other parts of the year, as will be seen from the following table.