

10. Tripartite Observations of Microseisms in Yamagata City.

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Tripartite observations of microseisms was made at Sakata City in Yamagata Prefecture, and the results was published in this journal¹⁾. Yamagata City is about 90 km SE of Sakata City, and is at the end of Yamagata Basin. Amplitude of microseisms seems to depend on the ground, and Yamagata was thought to be on harder ground than Sakata. So tripartite observations at Yamagata were planned to compare microseisms at the two places. The tripartite stations were set in September and October of 1957, but amplitudes at Yamagata were too small to observe, and available records were obtained only on Sept. 7, Sept. 8 and Oct. 7 in 1957. Comparison of amplitudes of microseisms on these days at several stations in Japan are shown in Table 1.

On Sept. 7, 1957 "Typhoon No. 10" was at Kyushu, central pressure 960 mb, and then it went north-east along the mainland of Japan.

Table 1. Amplitudes of Microseisms at Stations in Japan.

| | Sept. 7 | Sept. 8 | | Oct. 7 | | |
|------------|---------|---------|-------|--------|------|------|
| | 21h | 8h | 11h | 3h | 5h | 16h |
| Sendai | (0.5) | (2.2) | (3.3) | 6.0 | 8.7 | 6.6 |
| Tokuba | 0.1 | 0.4 | 0.4 | 0.8 | 0.8 | 0.5 |
| Mitaka | 8.0 | 12.0 | 14.1 | 20.1 | 22.2 | 14.7 |
| Nagoya | 20.5 | 18.7 | 8.1 | 12.6 | 12.6 | 10.5 |
| Abuyama | 1.6 | 1.0 | 0.6 | 1.1 | 0.6 | 0.7 |
| Matsushiro | 1.0 | 1.2 | 1.1 | 0.3 | 0.3 | 0.5 |
| Nagasaki | 0.6 | 1.3 | — | — | — | 0.6 |
| Yamagata | 0.7 | 1.1 | 1.3 | 1.9 | 1.8 | 1.6 |

(NS component in micron, except in () EW component).

1) F. KISHINOUE and I. SHIDA, *Bull. Earthq. Res. Inst.* **34** (1956), 301-306.

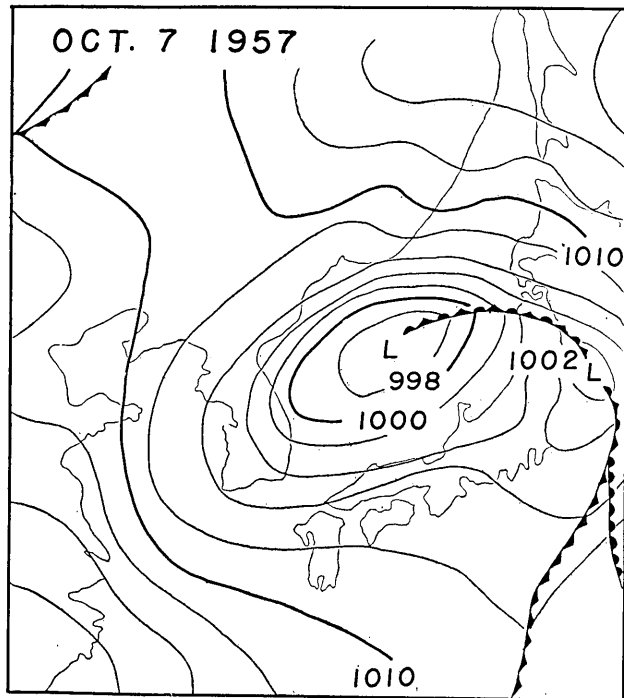


Fig. 1. Weather Map.

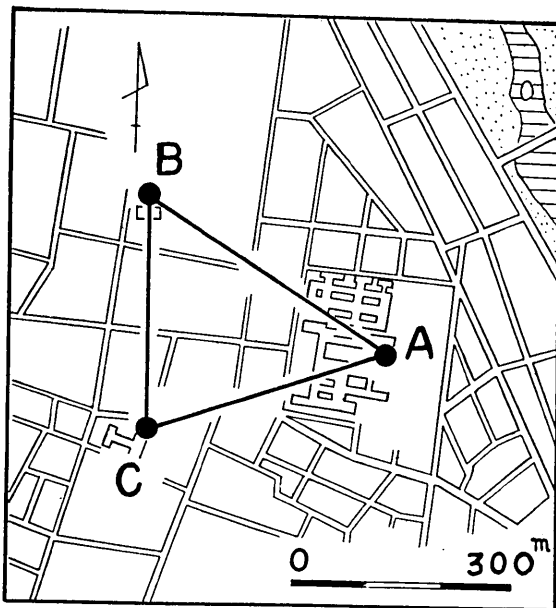


Fig. 2. Observation net.

On the next day, it rained heavily in Kyushu and Shikoku and passed off the eastern coast of Hokkaido.

On Oct. 7, a cyclone about 996 mb was near at the centre of Japan Sea, and Tokyo and its neighbourhood suffered from heavy rains and flood. (Fig. 1).

In the above-mentioned meteorological conditions microseisms at Yamagata became large, and tripartite observations could be made. Three temporary stations were set up at the labora-

tory of physics in the Faculty of Education of the Yamagata University (A), the Yamagata Meteorological Station (B) and Shinoda Hospital (C). The positions are shown in Fig. 2, and distances between these stations AB 353 m, BC 310 m and CA 339 m. Seismographs were mechano-optical ones frequently employed by the writers for study of microseisms²⁾.

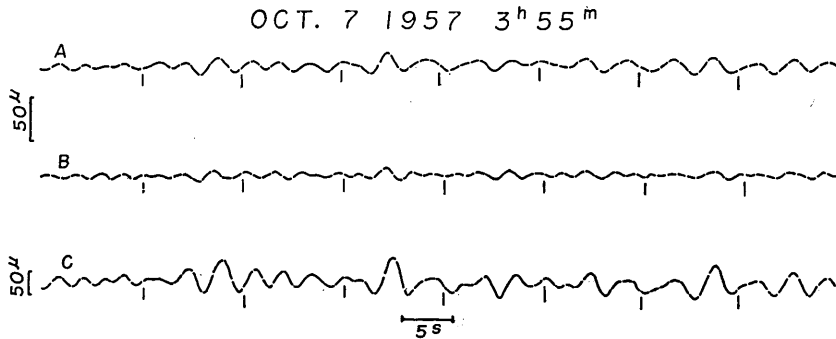


Fig. 3. Records of microseisms.

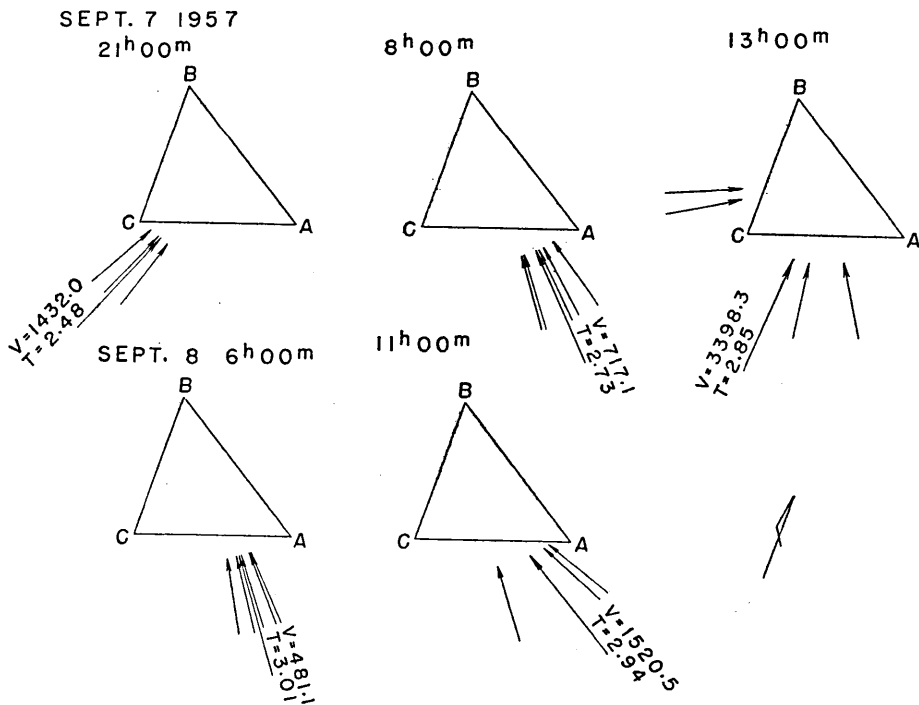
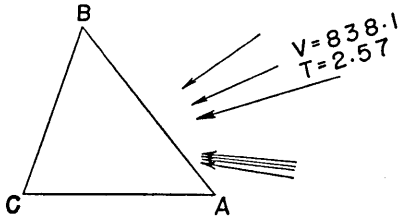
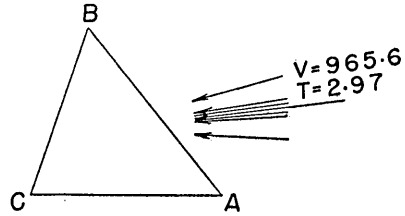


Fig. 4a.

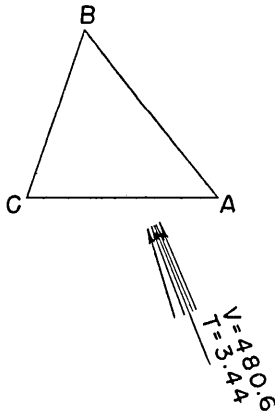
2) F. KISHINOUE, *Bull. Earthq. Res. Inst.* **20** (1942), 215-219.

OCT. 7 1957
2 h 40 m

5 h 00 m



3 h 55 m



15 h 55 m

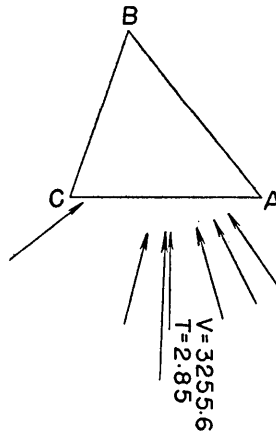


Fig. 4b.

Conditions of the instruments were $T_0=10$ sec., $V=800$ and critical damping.

Amplitudes of microseisms were so small as mentioned before, that finding of corresponding phases of microseisms was difficult, and number of tripartite observations were small.

Results of the observations are shown in Figs. 3 and 4. We could not find coincidence between direction of propagation of microseismic waves and azimuth of cyclone from the stations.

Periods of microseisms at Yamagata were observed to be small as compared with those at Sakata. The average period was 2.9 sec, and at Sakata 4.0 sec. The velocity of propagation was obtained here as a mean

3) R. Ikegami, *Bull. Earthq. Res. Inst.*, **29** (1941), 313-325.

1450 m/sec. In the investigation at Mitaka³⁾, dispersion of microseismic waves was discussed, but here we could not tell about dispersion for variation of periods was small in this case.

Wave-length was calculated by multiplying wave velocity by vibration period. The wave-length was obtained as 4.5 km. The value is larger than those at other places; Mitaka 2.2 km, and Sakata 2.0 km. The difference of wave-length may be due to elasticity of the ground of stations, in other way we may not explain the difference of periods of different places. We think at present we must observe microseisms at many places and in many cases to know their nature.

10. 山形市における土地脈動の三点観測

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酒田で脈動の三点観測を行つた結果と比較して山形でも三点観測を行つた。山形は脈動の振幅が小さい所であつて、三点観測のできた回数が少なかつた。脈動が低気圧の中心の方向から伝播する説には合わなかつた。山形は周期が約 2.9 秒で酒田 (4 秒) よりも小さかつた。周期と伝播速度とから波長を求めてみると、山形では 4.5 km となつた、三鷹が 2.2 km/sec, 酒田が 2.0 km/sec となつて、波長が地盤の強さに比例するかも知れない。また脈動について結論を出すには早く、更に多くの地点で測定をしなければならない。
