

10. *Change of the Ground-water Level due to the Imaichi Earthquake.*

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(Read Feb. 21, 1950.—Received May 30, 1950.)

Preface.

Soon after the earthquake of 26th of Dec. 1949, which occurred in Imaichi district, Tochigi Prefecture, the writer went there principally to investigate the time variation of the ground-water level. For this purpose, he asked several suitable persons to observe, during January this year, the water-level of their wells once every morning before they bail water out of them. Dotted marks in Fig. 1 indicate the position of those wells, but, to the writer's regret, the results of the observation could not be obtained from all of them.

Change of level just after the earthquake.

The area where the ground-water level had been disturbed by the main shock covers the region including the towns of Nikko and Imaichi, and the villages of Toyo-oka, Shinden, Yamakubo, Ōsawa, Okurugawa and Itaga. The water of the wells decreased or dried up everywhere in this region, with the exception of the western half of Itaga, where it increased. The increase of water in the well or spouting of sand and water such as was observed at Fukui alluvial plain in the case of Fukui Earthquake did not occur at the fan of Daiya River. Fig. 2 shows the change of water-level at Itaga village.

Time-variation of ground-water level after the earthquake.

Fig. 3 shows the results of the observation of water-level referred to above. These curves have many features common to each other. That is, after the earthquake, the water-level fell down until it reached a minimum point, and then gradually rose up, but the water-level has not yet attained the level prior to the earthquake. At Nagahata, the place nearest to the epicentre, the water-level became stationary earlier than at other places. A similar change was reported in the case of Fukui Earthquake, 28th of June 1948. In the present case, it is obvious if we consider the data of rain-fall and barometric pressure, that these meteorological conditions did not play an important rôle. Then what could be the main cause of these changes of

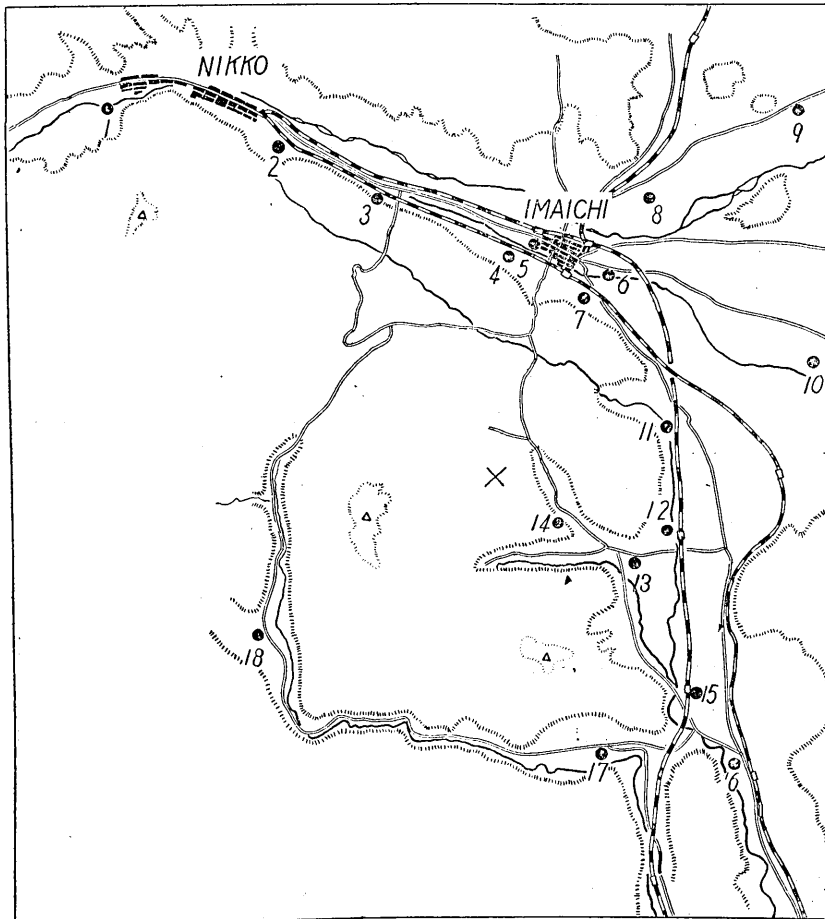


Fig. 1. ×. Epicentre, 1. Nikko, 2. Shichiri, 3. Noguchi, 4. Kitaizumi, 5. Imaichi, 6. Shichihon-zakura, 7. Murose, 8. Serinuma, 9. Todoroki, 10. Ōsawa, 11. Myōjin, 12. 13. 14. Nagahata, 15. Shimokojiro, 16. Fubasami, 17. Itaga, 18. Okurugawa.

ground-water level? To our regret, it is impossible, as the case stands at present, to deduce their cause quantitatively.

But this fact is worthy of notice as a phenomenon accompanying the earthquake.

Some other particular changes.

a) In the case of a well in a lumber mill at the southern end of Imaichi town, they could not use the pump from the middle of November 1949 due

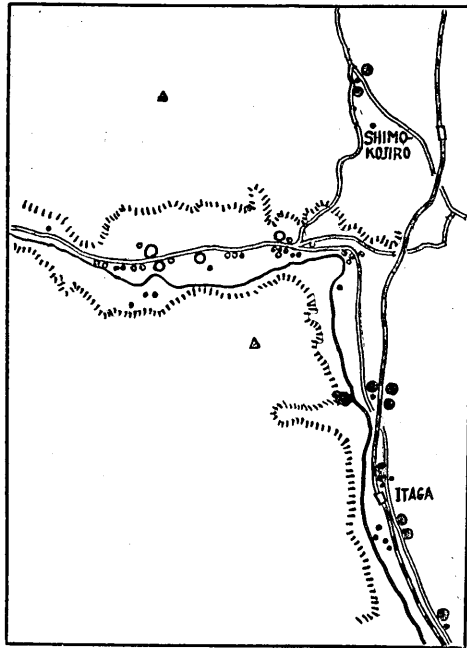


Fig. 2. Change of the ground-water level at Itaga village.

- Level fell down more than 2 feet.
- Level rose above more than 2 feet.
- " 1-2 feet.
- " 1-2 feet.

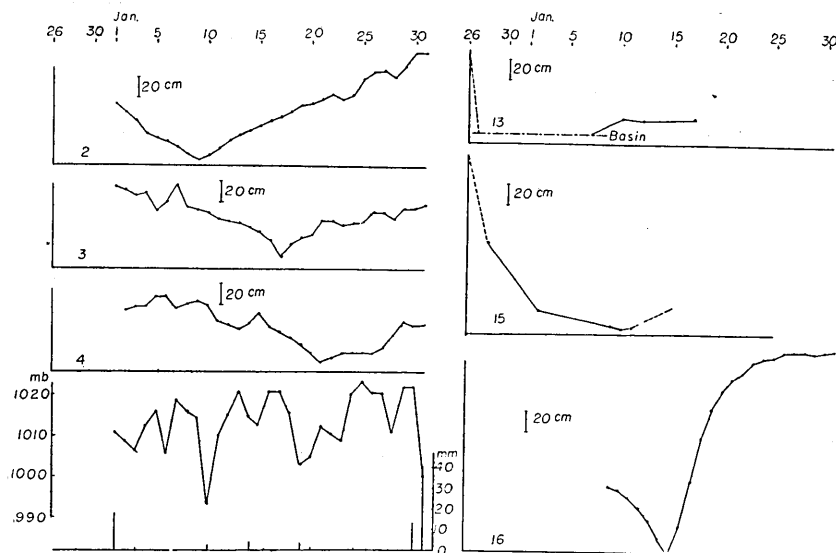


Fig. 3. Time-variation of the ground-water level at 2, 3, 4, 13, 15, 16 in Fig. 1. Rain fall and barometric pressure at Utsunomiya city are shown at the bottom of the left side.

to the decrease in the water. Similar phenomena also occurred at Shichihon-zakura, Kissawa and at Murose.

b) Sakura hotel at Kinugawa hot springs.

They say that in the middle of last August, silver ring became black due to the spouting of sulpheric substance for two or three days. The same occurred at the time of the earthquake. The temperature of the hot springs has risen by 2°C-3°C from the time of the earthquake.

In conclusion, the writer's sincere thanks are due to those men who took the trouble to observe the water-level for one month at the writer's request.

10. 今市地震に依る地下水位の變化

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福井地震の際に地下水位の時間的變化に興味ある點を見出したので、今回の今市地震の時は地下水位の時間的變化を主に調査した。十數箇所の井戸水位の1月間の毎日1回の觀測を依頼してその結果に就いて調べると、板荷村の西半分を除いていづれも地震に依つて水位がぐんぐん減少し、ある極小値に達してから又次第に水位が恢復しつゝある事が判つた。此の結果を定量的に解析する事は不可能であるけれども、もつと徹底的に調べれば、地震に伴つた現象としてその價値を發揮するかもしれない。
