11. *On the Vertical Displacements Accompanying Imaichi Earthquake in 1949.*

By Eiji INOUE,*

Geographical Survey Institute.

(Read Nov. 21, 1950.—Received Dec. 20, 1950.)

1. Introduction.

For the purpose of detecting the vertical displacements of the earth's crust accompanying the Imaichi Earthquake on Dec. 26 1949, the preliminary precise levelling was carried out by Geographical Survey Institute in June 1950. In this paper, the results of the survey are reported.

2. Routes of the Precise Levelling.

The main route of levelling is from Utsunomiya to Nikko via Imaichi and the branch route is from Imaichi to Fujiwara. The main and branch routes on which the precise levellings were carried out are shown in Fig. 1.

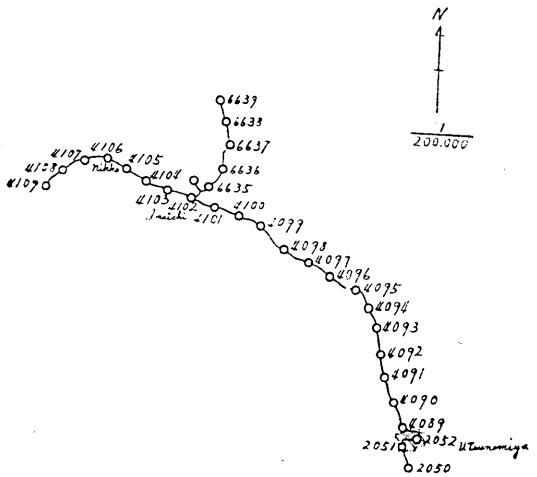

Fig. 1. First order levelling route near Imaichi (1950).

In the past levelling, the former route had been carried out in 1925 and the latter in 1898.

* Communicated by T. Hagiwara.

3. Results.

The vertical displacement of the respective bench mark is shown in Fig. 2. The curves represent the changes in levels during the period 1925-1950 and 1898-1950, the B.M. B-4 at Utsunomiya being assumed as fixed.

In Fig. 2, the area of the remarkable displacements is situated in the range within 10 km radius from Imaichi. In the outside of the area, the displacements are less than 1 cm.

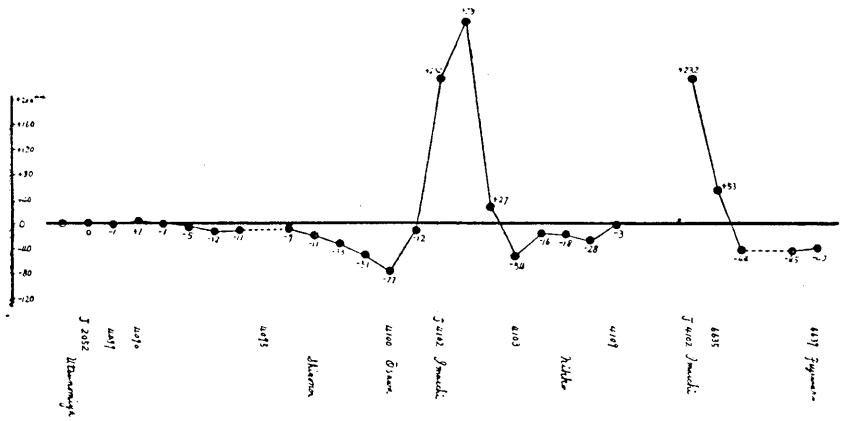

Fig. 2. The change in level accompanying the Imaichi earthquake on Dec. 26 1949.
{Main route from Utsunomiya to Nikko (1925—1950)}
{Branch route from Imaichi to Fujiwara (1898—1950)}

The amount of the vertical displacements reaches a maximum (upheaval of about 34 cm) at the westside of Imaichi and a minimum (subsidence of several centimeters) in the surroundings of the upheaved area, and outside of these areas, the displacements are nearly equal to zero. But, on the route from Imaichi to Fujiwara, a subsidence of 3 or 4 cm still remained at Fujiwara which is more than 10 km away from Imaichi.

On the route from Utsunomiya to Nikko, the first survey was carried out in 1897-1898, and the second survey in 1925 after the Great Kwanto Earthquake in 1923. In Fig. 3, the displacements during the time interval 1898 and 1925 are shown the B.M. J 2052 at Utsunomiya being assumed as fixed. The resulting displacements, summing up the displacements shown in Figs. 2 and 3, namely, the changes in levels during the period 1898-1950, are shown in Fig. 4, in which the amount of subsidence at Fujiwara is

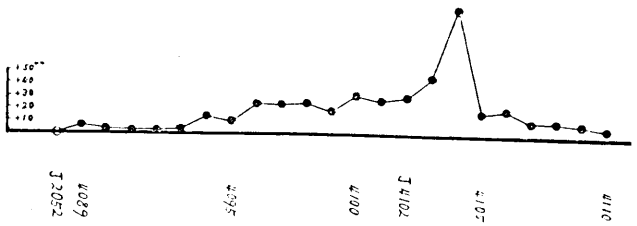

Fig. 3. The change in level in the main route (1898—1925).

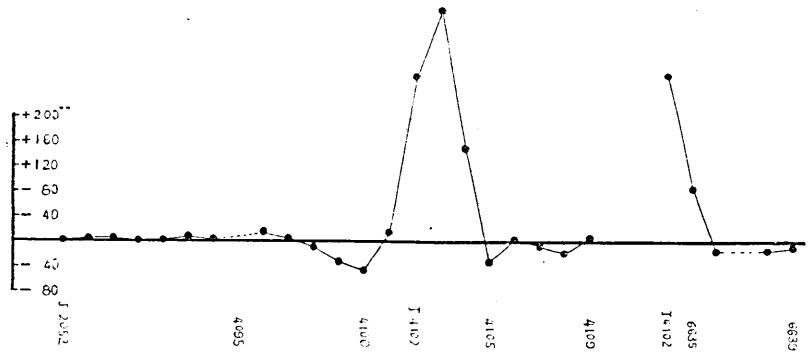

Fig. 4. The changes in level in the main route as well as in the branch route (1898—1925).

nearly equal to zero. From this fact, it seems that the area of Imaichi was upheaved 3 or 4 cm compared with Fujiwara area during the time interval 1898 and 1925 including the Great Kwanto Earthquake in 1923. (see Fig. 5)

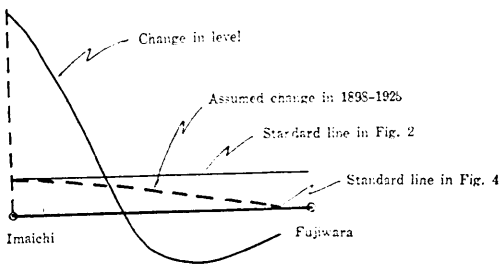

Fig. 5.

From the above mentioned facts, it is considered that the displacements accompanying this Earthquake were of small scale, and only upheaval in the epicentral area near Imaichi and the subsidence in its northside sur-

roundings were to be found. In the southside of Imaichi where the epicenter was situated, the levelling route is not yet established, so the feature of the displacements in this region is unknown. But the features of displacements in the northside and the southside are supposed to resemble each other in general.

---

11. 今市地震 (1949) に伴う地殻の垂直變動について

地理調査所　井上英二

本文は 1949 年 12 月 26 日の今市地震に伴う地殻の垂直變動調査の概報である。調査の結果，變動の顯著に認められるのは震源を中心とする半徑 10 km の範圍内のみであり，この事はこの地震が局部的なものである事を示している。變動量の最大は約 30 cm 程度であり，その特徴は震源附近が著しく隆起し，その周緣部が或る程度の沈降を示している事である。