17. **Crustal Disturbance in Kwantō Districts.**

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In a number of papers recently published, the present authors carried out an analysis of the results of the repeated trigonometrical survey in the Kwansai Districts\(^3\) as well as in the vicinity of Sakurazima volcano\(^3\) and compared the divergence \(J\) of the horizontal displacements of the trigonometrical points with the vertical displacement \(W\) of the land and also with the topographical feature of the district. The similar method of analysis was now applied to the case of the Kwantō Districts\(^3\) for which the necessary data are already available. The results may be summarised in Fig. 1 and 2.

Comparing the geographical distribution of the divergence shown in Fig. 1 with that of the vertical displacements\(^4\) of the districts as deduced from the results of the pre- and post-seismic levelling surveys we may remark the following:

1. A zone of general depression lying towards W of Tokyo extending to W-side of Mt. Tanzawa corresponds generally with the area of negative divergence.

2. The remarkable depression of the sea-bed in the Bay of Sagami coincides with the large negative divergence in the same bay.

These two results are in accordance with those relations obtained in the case of Kwansai and Sakurazima districts.

3. The coastal zone extending from Bōsō Peninsula to the coast of Sagami over Miura Peninsula, which was characterized by a

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2) T. Terada and N. Miyabe, Proc. 5 (1929), 322.
3) The divergence and rotation for the Kwantō Districts have already been calculated by Prof. Fujiwhara and Mr. Takayama of our Institute by a method essentially similar to, though somewhat different in details from that of the authors'; see Bull. E.R.I., 6 (1929), 149. It was considered, however, not superfluous to apply here the same method as in the case of the Kwansai District for the sake of comparison. Comparing our Fig. 1 with the corresponding map (Pl. VII) given in their paper cited, it will be seen that the two results obtained from the different combination of the same data agree well in general features. On account of a somewhat closer net-work of triangles here availed of, some details of the trend of iso-lines are revealed especially in the case of Bōsō Peninsula.
Fig. 1. Divergence in $10^{-5}$; + means dilatation, — contraction. ○ and ∘ are the trigonometrical points, primary and secondary respectively.

Fig. 2. Axes of strain ellipse; —— contraction, ------ elongation.
remarkable upheaval at the time of earthquake, is generally allotted with negative divergences in our map, Fig. 1, on the contrary to our expectation.

Again, with regard to the relation of $J$ with the topographical feature, we may remark the following:

(1) The Bay of Sagami and the low Kwantō Plain generally fall in with the areas of negative divergences, which is in accordance with the case of the Kwansai Districts.

(2) Bōsō and Miura Peninsulae contradict the expectation based on the analogy of the other cases and show upheavals of land in the areas of negative divergences.

Here we may be reminded of the fact that in the case of the Kwansai Districts, the correlation between $J$ and the topography was not so good in the case of Oku-Tango Peninsula as in the interior of the land. Thus we are lead to suspect that the said correlation may generally hold in the interior of land not disturbed by any severe earthquake, while it may fail in the coastal regions subjected to seismic disturbances, especially in the case of peninsulae. This conjecture is made in some measure plausible, as the recent investigation of Dr. Mutō and Captain Atumiii has shown that peninsular blocks generally show a characteristic mode of post-seismic tilting motion such that such a block seems to have its "hinge" at the junction with the main body of the land to which it is attached. According to our opinion, postulated in our previous papers, these peninsulae are probably the marginal fragmentary blocks of the land body bounded on one side by the oceanic sima bed. These marginal blocks may be especially sensitive to the crustal disturbances owing to their greatest freedom.

In Fig. 2 are shown the magnitudes and directions of the strain ellipses for different triangles. It seems plausible to draw a line of discontinuity somewhere about NE side of the Bay of Sagami, or across the mouth of the Bay of Tokyo, a line which roughly coincides with the supposed line of dislocation considered as the main source of disturbance of the Great Earthquake of 1923.

On the other hand, the active fault lines in the Kwantō districts depicted in a recent paper by Prof. Imamuraii show a general tendency to run in NW-SE direction in Sagami district and in W-E in Bōsō

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1) The paper was read before the Meeting of the Institute; not yet published.
district. This may be physically connected with the fact that the prevailing direction of the axes of elongation in Fig. 2 differs widely for the corresponding two districts.

In passing it may be noted that the zone of land extending from Bōsō to Miura Peninsula for which the correlation between $\mathcal{A}$ and $\omega$ was in the opposite sense compared with the other cases correspond to a zone of negative gravity anomaly according to the recent data reduced by Prof. M. Matuyama and Dr. Kumagae of the Kyoto Imperial University.