

PREFACE.

In issuing this first of the publications in a foreign language of the Earthquake Investigation Committee, it may not be out of place to give a short account of the work which the Committee has been doing and of what it proposes to do in future.

The Committee was appointed by an Imperial Ordinance of June 1892 in accordance with the petition of the House of Peers and has now been in working order for about four years. It consists at present of twenty four ordinary and three extraordinary members, who are all either engineers or devoted to scientific work, and mostly connected with the Imperial University or Government departments. Its name is Shinsai-Yobō-Chōsa-Kwai, literally *Committee for investigating the prevention of earthquake disasters*. Its object is two-fold :— in the first place to investigate whether there are any means of predicting earthquakes and in the second place to investigate what structures and materials are best fitted to resist such shocks. For both purposes, it is of course necessary to ascertain the true nature of the phenomena connected with earthquakes, as far as possible.

The investigations already undertaken with the above objects are many and various ; a full account of them is contained in the twelve volumes* of Reports of the Committee published in Japanese.

The following are some of the more important :

I. *Collection of facts concerning earthquakes, seismic waves, eruptions, etc.* For this purpose, on the one hand, histories, diaries, memoirs have been searched, with the result that at present the Committee is in possession of a pretty complete record of the earthquakes which have taken place in Japan, together

* There are some copies remaining which will be sent to institutions and persons specially interested in Seismology, on application to the Committee.

with references to original literature. On the other hand, reports have been obtained concerning recent earthquakes, among others the great Mino-Owari Earthquake of Oct., 1891, Hokkaidō Earthquake of March, 1894, Tōkyō Earthquake of June, 1894, Yamagata Earthquake of Oct., 1894, Tōkyō Earthquake of Jan., 1895, Akita-Iwate Earthquake of Aug., 1896, and the destructive sea waves of June, 1896; account being given in these reports of the probable origins of the earthquakes, geological changes observed after them, damages done by them, their after-shocks, etc., etc.

II. *Geological investigations* of the causes of earthquakes and relation of earthquakes to geological formations, etc.

III. *Investigations connected with the nature of earthquakes*, especially the law of propagation of waves. For this purpose all the meteorological stations have been put in electrical communication; and a special line has been constructed connecting electrically three seismographic stations in different parts of Tōkyō with that in the seismological laboratory of the Imperial University; so that simultaneous records are taken at four stations of one and same shock. A Rebeur-Paschwitz horizontal pendulum to observe earth pulsations has been ordered and will be set up as soon as it arrives.

IV. *Magnetic observations*. It seems to be established that earthquakes have a connection of some kind with changes in terrestrial magnetism and there is some ground for suspecting that certain earthquake shocks are preceded by peculiar changes in the magnetic elements. A magnetic survey of the whole of Japan has been completed and will be repeated at intervals; also magnetic observatories, fitted with instruments for photographically recording magnetic elements, have been erected in Nagoya, Sendai, and Nemuro, besides one in the Central Meteorological Observatory, and one which is now being erected in Kumamoto.

V. *Under-ground temperature observations*: for this purpose a well is now being sunk in the Tokyo Imperial University grounds to a depth of about 1000 metres, and several other such wells will be dug and temperature observations made in them.

VI. *Gravity observations*: It is intended to observe the force of gravity all over Japan, and already for this purpose, one-second and half-second reversible Bessel pendulums have been made for the Committee by Messrs. Repsold and Sons, and a Sterneck half-second pendulum has been ordered.

VII. *Latitude observations*, of which the first are recorded in the present report. Thanks are due to Prof. Terao, Director of the Tokyo Astronomical Observatory, who has kindly placed a special building for the purpose at the disposal of the committee and otherwise courteously facilitated the work.

VIII. *Testing the strengths of various building materials*: the Committee has been obliged to make these tests, there having been very few made hitherto on the strength of Japanese timbers, etc.

IX. *Testing various structures and joints*. Experiments have been made with bricks and wooden blocks. Several houses, mostly wooden, have been designed and erected in places likely to be well shaken, in order to test them as to their capacity of resisting shocks. A table has been constructed, capable of being artificially shaken, on which various structures have been placed for the same purpose. Also several models have been made and exhibited in order to introduce improved construction for houses in Japanese style.

Such are some of the works of the Committee; a detailed account of those of them likely to be interesting to foreign scientific men and engineers, will be occasionally published in a foreign language, this report being the first of the series.

In conclusion, I take this opportunity of expressing my sense of admiration for the members of the Committee and their assistants who have given their time and labour without stint to these investigations.

Aug., 1897.

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Investigation Committee.*
