

## PREFACE

The earthquake that occurred off the Pacific coast of Sanriku on March 3, 1933, was so strong that it was sensibly felt throughout the eastern half of Japan. Fortunately, however, no damage was caused to ordinary houses even in regions close to the epicentre, but the tsunami that swept the coast about half an hour after the earthquake caused great loss in life and property. The Sanriku coast has long suffered from tsunami, the previous one of 1896 having been so violent as to be still vividly remembered. On comparing the damage caused by the 1896 tsunami with that caused by the last one, in the former the sea waves rose a little higher in some regions than in the latter, while in the extent of the damage and its distribution, they were about same. Our studies lead to the conclusion that, generally speaking, tsunamis virtually visit the same region every time.

Since we may assume that tsunamis are caused by topographical changes occurring on the sea floor, it is obviously impossible to prevent their occurrence, but man can do much to minimize, if not prevent, their damage, seeing that it is nothing more than an inundation of the land by huge sea waves. And since such preventive measures can be devised only with a thorough knowledge of the phenomena of tsunami itself, it is clear that we should start with a correct understanding of the subject.

Since tsunamis seem to occur only at intervals of several decades, it behooves us to miss no opportunity of studying them with all the resources at our disposal when they do occur; and it was with this idea in mind that we despatched several members of the Institute staff to the scene of the afflicted area immediately upon receipt of news of the disaster.

These observers made careful and painstaking investigations on the spot and returned with a large collection of observed data. At the same time the authorities of the regions concerned were requested to furnish us with copies of mareograms, while the same authorities and a number of school teachers in those districts were requested to send us reports of what they had observed and experienced at the time, either to be supplied by themselves or to be obtained from reliable eye-witnesses. These appeals, we are glad to say, met with favourable response.

The main points investigated by our own observers are the highest

levels reached by the tsunami as revealed through traces left by the receding waves, the areas of the regions inundated, the extent to which houses and other structures were damaged, and the relations between the severity of the effects of the tsunami and topographical conditions. As special investigations, some of our observers carried out instrumental measurements of the heights attained by the waves in such towns as were very severely affected by the tsunami, while others measured the magnitudes of secondary undulations and surface waves that occurring in some of the bays.

Most of the foregoing data being investigations of tsunami as actually observed on the spot, it was felt that we should go a step further and study the phenomena of tsunami experimentally. This resulted in experiments that were conducted at the Institute laboratory where, by means of models, the conditions of nature were simulated as far as possible. Comparative studies of these experiments with the tsunami in nature and with the various conclusions arrived at from theoretical treatments of the subject, will undoubtedly throw some light on the real nature of tsunami phenomena.

The present volume, which is the realization of our project to publish the results of the studies we have made in connection with the subject, forms supplementary volume I of the "Bulletin of the Earthquake Research Institute." The contents are divided into two parts: the first contains the research papers and the second the various reports from the afflicted regions and other data.

It is hoped that this collection of papers, which scarcely go beyond the preliminary stage of research, will not be without value as a contribution to the knowledge of tsunami. They will be followed by further papers on the subject to appear in future volumes of the Bulletins of this Institute.

In closing this preface we wish to thank all those in the afflicted districts who so willingly responded to our appeals for assistance in securing data. We wish also to acknowledge here the financial aid so generously given by the Central Bureau of our University and by the Department of Education to defray the extra expenditure in connection with this research, and also the aid given by the Hattori Foundation towards the cost of publishing this volume.

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Director, Earthquake Research Institute.