January 1969

# A PRELIMINARY REPORT ON THE INANGAHUA EARTHQUAKE NEW ZEALAND, MAY 24, 1968

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| Origin Time: | 1968 May 23d 17h 24m 16.7 ± 0.25s (UT) |
| Epicentre: | 41.72° ± 0.03° South, 171.94° ± 0.02° East |
| Focal Depth: | 12 km (restrained for computations) |
| Magnitude: | Richter's local magnitude scale, 7.0 $M_L$ |
| Intensity: | Maximum, in Modified Mercalli Scale, M.M.X |

C O N T E N T S

EXTRACTS

"The Inangahua Earthquake of 5.24 a.m. on May 24, 1968 was the first New Zealand earthquake to reach magnitude 7 since that in Fiordland on May 24, 1960 .... It became the sixteenth earthquake believed to have reached magnitude 7 or greater since 1848, since when all such earthquakes should have been observed ...."

"Faulting took place at two localities, near Inangahua Junction railway station and about three miles north of Rotokohu. In both places movements comprised horizontal, vertical and thrusting components.... Inangahua lies at the northern end of the 60-mile-long Grey-Inangahua Depression, a complex structural feature between predominately-granite ranges to the east and west ...."

"The maximum intensities reported are close to Inangahua, some 15 km south of the (instrumental) epicentre. Large landslides (one of them responsible for two deaths and another temporarily blocking the Buller River), serious damage to wooden structures including houses and bridges, bending of railway lines, breaking of underground pipes, slumping and cracking of roads, and ejection of ground water, establish an intensity of M.M.X ...."

"Because there were no major engineering works, (heavy commercial or industrial buildings) or multistorey buildings in the area, the main lessons for engineering seismology were indirect. The low casualties and relatively low damage may lead to severity of this earthquake being underated."

"From aerial reconnaissance late on the morning of the earthquake, it was clear that severe damage to buildings had occurred at the township comprising Inangahua Camp and Inangahua Junction; and in farmland within a radius of five to eight miles."

"The 6.30 a.m. N.Z.B.C. radio news stating that mild earthquakes had been felt between Muriwai and Timaru, made us aware that no one knew of our plight. This prompted us to organise our community to spend an indefinite period in the shattered township."

"Immediately the emergency had been declared the safety of the people in the Inangahua area became our first consideration.... Of necessity the helicopters were required to fly and land in very difficult areas, flying late into the night, landing under conditions that were hazardous because of the terrain, the continual fog and the encroaching darkness.... As soon as possible after the rescue and the providing of the necessary welfare, consideration was given to the restoration of roads, bridges, electric power and telephone lines, supply systems and other services."

"A road block was established on the only accessible road into Inangahua and official daily passes were issued by the police at civil defence headquarters.... When the disaster area was finally opened to the public, police presence was essential, because sightseers attempted to wander across properties and through homes."

"If one accepts the premise that people matter more than things, then public relations becomes of prime importance in any restoration work. Should a disaster, such as the one experienced on the west coast, this year of 1968, occur in an area of greater population density, then I think it would be necessary to have several men and women capable of dealing with people's questions, fears, and criticisms."

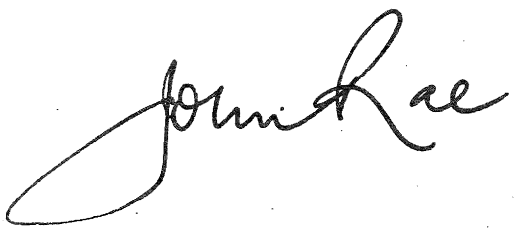
# FOREWORD

We are indebted to the many contributors to this Bulletin for putting on record their experiences and impressions of the Inangahua Earthquake in this preliminary report while events are fresh in their minds and in the minds of the public.

There are lessons to be learned from every earthquake and in recent times Government has recognised this by sending officers of Ministry of Works or D.S.I.R. to view earthquake damage in other countries and this has led to strengthening of building codes and the erection of safer buildings.

However, when an earthquake occurs in our own country there are many problems both material and human which have to be handled with authority and expedition. I am sure it will be recorded of this earthquake that all the forces of State Departments, Local Bodies, Civil Defence, social workers and private citizens worked tirelessly at the time and have continued to work to relieve distress and restore communications, services and habitations, not only at Inangahua but over the wider area of the West Coast and even further afield.

It would be impossible to nominate all those deserving of our praise in this regard, but I conclude as I began by complimenting the contributors to this Bulletin who have put the story on record so that we may benefit from their experience should a similar disaster occur again in New Zealand.



Minister in Charge of the
Earthquake and War Damage Commission

# INTRODUCTION BY SOCIETY CHAIRMAN

W. P. Edwards*

The New Zealand Society for Earthquake Engineering considered that it was important to publish, as early as possible, the observations of many persons who were in the earthquake area during and after the shock of May 24, 1968. The reports in this special bulletin are preliminary reports but they cover a wide field of different experiences during this period. This is the first occasion in New Zealand that such a comprehensive record of both technical and other valuable information relating to a particular earthquake has been compiled.

The subject matter ranges from reports of the seismological and geological observations, local reconnaisance, damage in the various areas to structures of all kinds and to the means of communication and services which we take so much for granted - water, power, drainage and sewerage - to the combined efforts of organisations concerned with the protection of life and property and to one not so obvious aspect, namely, the restoration of morale and confidence by a local Public Relations Committee.

This is essentially a technical journal, but we make no apologies for including non-technical records. In fact, a perusal of these latter will disclose quite clearly that scientists, engineers, assessors and the like, who enter the earthquake areas immediately after such a disaster, must become part of a complete team and cannot be indifferent to the humanities of the situation. These records remind us that the purpose of science and engineering is to serve the people and that it may be easier to solve a technical problem than a human one. A disaster area is full of human problems.

The experience of engineering and scientific observers must be tempered by what they see in the disaster areas. This raises the point of the provision of experienced observer teams for local reconnaisance and the New Zealand Society for Earthquake Engineering has undertaken to set up the organisation for this very purpose so that, in a future earthquake, qualified observers are available for immediate duties at the scene of the earthquake.

In reading some of the following reports, it will be observed that, in some papers of similar subject content, there are conflicting opinions as to what happened or what was regarded as the "correct policy" at the time. Each earthquake area will have its own special problems and it would be impossible to provide for all contingencies. It is natural, therefore, that in some cases better ways could have been developed to overcome this or that set of circumstances (mainly in the human field, rather than the technical). However, the various authors have set down their observations and the impressions they gained. Their experiences should be studied and action taken to ensure that improved procedures can be developed for coping with future disasters of this kind.

The Management Committee of the New Zealand Society for Earthquake Engineering expresses its most grateful thanks to the authors of the

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+ Consulting Engineer, Wellington.

Preliminary Reports of the Inangahua Earthquake for the time, thought and care taken in the preparation of their contributions.

The Committee would also like to place on record here its gratitude to Dr. Bruce H. Falconer for preparing this special bulletin. It was his responsibility to suggest the format, to make approaches to prospective authors, to receive drafts of preliminary and final manuscripts, to check them and place them in a logical order. With his experience in the field as a Consultant to the Earthquake and War Damage Commission at the time of the earthquake and subsequently, Dr. Falconer was most qualified for this onerous duty. His personal contribution as an author and as a collator has been of inestimable value to us and the time he has so generously given will be appreciated by all of our members who read this special bulletin.

Finally, we greatly appreciate the continued interest of the Hon. John Rae, Minister in Charge, Earthquake and War Damage Commission, who has kindly contributed the Foreword.

W. P. Edwards,
Chairman, Management Committee,
New Zealand Society for Earthquake
Engineering.