

facilities the design should provide a higher factor of safety against earthquake force than in structures of less vital importance.

*Emergency Organization.*—The Building Regulations Committee, in its deliberations, has frequently touched on the subject of danger from fire. No attempt has been made to devise regulations for ensuring greater resistance to fire, except in so far as improved resistance to structural damage automatically reduces the risk of the outbreak of fire after an earthquake. In view, however, of the grave fire risks, no apology is needed for a reference here to the need for preparedness in all our cities for a possible calamity. Some of our cities are already taking action. The organization of the Christchurch Public Utilities Committee appears to be a good model. It is suggested that emergency stations should be selected in all our cities in which copies of records, plans, &c., of vital importance, in case of a great disaster, should be filed. These depots, if possible, should be interconnected by private telephone.

The necessity for critical examination of all fire-fighting services, water-supply, drainage, electric supply, and communication systems should be obvious.

*Danger of Panic.*—Probably for some years to come the public of New Zealand will be susceptible to panic should a perceptible earthquake occur while large numbers are assembled in one room. Overcrowding should be strictly prohibited, and exits properly maintained and policed. Where necessary, exits should be improved, and in new construction a high standard maintained in the provision of adequate exits.

*Existing Buildings.*—The Committee in its work has had to confine itself to the provision of a satisfactory standard of earthquake-resistance in new buildings only, in spite of the fact that many existing buildings are unsafe from this point of view. A certain amount of work is now being done to strengthen existing buildings and to remove unnecessary and dangerous weight therefrom. This policy is undoubtedly sound, and owners should act on the best technical advice procurable. The problem really requires a systematic survey of all doubtful buildings, so that the most dangerous may be selected for immediate action.

*Importance of Careful Design.*—The Committee is confident that there is in this country both the desire for improved building practice and the technical skill to achieve it. In the majority of cases the additional cost will not be felt. More science and less materials are required in our city buildings. This stricture does not apply to the best of our recent construction, but even in the last year or two a great deal has been spent in features of no use and of doubtful value as ornamentation. Such added weight, during an earthquake, only becomes a wrecking force.

In the past too much of our work has been planned by men without any true sense of æsthetic values or of structural principles. The Committee therefore desires to stress the value of competent architectural advice to owners. Buildings, too, should be simple in layout. There is a slogan among engineers that a work should be “simple, cheap, and efficient.” The preliminary layout of an important structure should be referred to the engineer in the early stages. He may be able to simplify the layout without any sacrifice of efficiency in the building, and thus greatly enhance its structural stability. The æsthetic treatment of the building will often be aided by the added simplicity of layout, and the construction will be cheapened. For resistance to earthquake shock the importance of simplicity of layout is very great indeed.

Competent men who visited Hawke’s Bay after the disaster do not require to be told the faults of our old building practices—gross faults in design and in construction. We have the men in New Zealand who can do better things, and the building-owners of the future should know how to proceed.

Our motto should be “Better buildings at less cost.” The question of cost has been steadily before the Committee, and, while the provision of resistance to earthquake force must increase the cost of the structural framework, it is felt that the reduction of useless ornamentation, and better designing, with the facilities of a uniform code, will largely, if not entirely, offset this extra cost. Also, the better construction of buildings will most assuredly be reflected in the annual cost for insurance.

The people of New Zealand must realize that the earthquake risk in this country is undoubtedly great, and that all structures, including buildings, if not properly designed and constructed to resist the destructive forces, will suffer in a severe earthquake. In future, the architect and the engineer must pay even greater attention to the importance of earthquake-resistant construction, and must co-operate with the geologist and the seismologist in the practical application of scientific principles.