LEADING ARTICLE

For vast areas of the Pacific ocean its name seems appropriate. But it is most inappropriate to the ocean's boundary zones; these include the circum-Pacific belt - a seismically active band or area within which originate most of the world's great earthquakes. The seismic belt encircles the whole Pacific except in remote southern latitudes near Antarctica. Being also notable for its many volcanoes, the belt is sometimes called the 'circle of fire'.

From south of Chile past the terrible Andean mountains to Mexico, the main line of activity runs northwards through California and along its coasts right on to the grim mountains and fiords of Alaska. Thence by the great island arc of the Aleutians with their volcanoes and abysmal depths, the seismic belt approaches Asia. Much further south there are various lines, arcs and wide branches along which lie the epicentres of many great earthquakes. Branches pass through Japan (in the Tokyo region), the Philippines, Taiwan, the Celebes, New Guinea and the Solomons. One branch, adjoining the Tongan and Kermadec deeps, extends down through New Zealand to Macquarie Island in the far south and then on towards Antarctica. The preceding is an unscientific and over-condensed account of the great circum-Pacific belt.

New Zealand, its adjacent submarine areas and its substructure constitute a complex, possibly essential, part of the world's greatest belt of volcanic and tectonic earthquake activity. This is the most significant single fact that lies behind our limited experience and records of local eruptions and earthquakes. The more thorough the study of the whole area and the possibilities of future seismic activity, the less justifiable appears any attempt at structural zoning. Further reference to zoning is made later; other matters require attention first.

Men eminent in many a scientific field, many a profession or business have recorded, studied and analysed data relevant to New Zealand earthquakes and problems arising therefrom. In addition there is no lack of information concerning structural theory, tests research and design. The proceedings of conferences held around the Pacific are of special interest and value - in particular those held at Tokyo (1929), San Francisco (1956), Tokyo again (1960) Auckland and Wellington (1965).

We have necessary data, means, men, most materials and the beginnings of a strong demand. Evidently the really troublesome problems are not so much technical as those of organisation, finance and business generally. Some efforts have been made to cope with the situation. Established well over twenty years ago, the Earthquake and War Damage Commission administers accumulated funds from which many claims are met. More recently a modern building code has been developed and is now fairly widely operative. Both Commission and code are helpful but both have weaknesses. As to the Commission - the then secretary, Mr J. R. Bennett, in his most informative paper at the 1965 conference, states, "About 90% of the claims are for damage to domestic chimneys". But vulnerable types are still being built. These, added to all those which were already in existence, may someday provide a more extensive basis for even more numerous claims.

There is a weakness of a different character in the building code, (official title N.Z. Standard Model Building Bylaw); this is a pity because, in many respects, the code is most satisfactory. The basic weakness lies in the adoption of seismic zoning in the first place; on top of this detailed provisions are arbitrary, illogical and provocative. They are arbitrary as to boundaries and differences in lateral force provisions for the separate zones; they are illogical through the tacit assumption that moderate differences in lateral force requirements are matters of primary importance in relation to safety and freedom from damage; they are provocative because (1) they assume that precise distinctions in a most uncertain field are worthwhile (2) it will be virtually impossible to obtain evidence proving that such distinctions have any value. There are too many other complicating factors.

Apart from interesting problems concerning Commission and code there are others - real, urgent and somewhat intractable. They exist in the larger towns and cities of both islands; they mostly derive from the excessive amount of obsolete bearing wall and timber floored construction still in use. Auckland has some large and appalling examples - four or five storeys of heavy brickwork precariously balanced over spacious modern show windows. This kind of thing exists in many towns, but with good reason the dangers implicit in such obsolete constructions are held to be most acute in the capital. Determined efforts at extensive reconstruction there are certainly necessary - otherwise there could be a case of too little and too late.

Finally a brief enumeration of sundry matters relevant to aseismic construction may be of some interest.

1. First class uncomplicated aseismic city buildings can provide both safety and a good long term investment.

2. The longer new construction, needed to replace the obsolete and potentially dangerous, is delayed the greater the risk and the greater the loss.

3. Whenever possible avoid attempts at strengthening old structures; the main effect is often merely to perpetuate the decadent and obsolete.

4. Too many, too detailed, too precise mandatory requirements can often militate against the production of the best and most efficient aseismic structure.

5. The need for demolition of decrepit structures and their replacement by the safe and modern is most pressing. There is therefore no valid reason for any competent worker in the building field to be unemployed.

The preceding items may be viewed as dogmatic assertions, statements of fact, or merely expressions of thought or opinion. Which viewpoint is taken doesn't matter one scrap. What does matter is that action be taken promptly in a really worthwhile effort to tackle the earthquake problem.

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