Newcastle

FINDING

NEWCASTLE EARTHQUAKE DISASTER

OF THE 28TH DECEMBER, 1989.

FINDING DELIVERED 18TH JULY, 1990.

HISTORY:

On the 28th December 1989, an earthquake measuring 5.6 on the (Richter) scale struck Newcastle. The shock effects were felt as far afield as Bateman's Bay to the South, Dubbo to the West and Armidale to the North, in particular, though some radiating effects were experienced in Melbourne and on the Gold Coast (Dr Rynn).

The epicentre of the earthquake was some 15 km WSW of centre of City of Newcastle near Boolaroo, and the focus 11.5km beneath that epicentre ..... a relatively deep earthquake.

The effect of the earthquake was amplified by the fact of parts of Newcastle near the Central Building District being erected upon alluvial soil, the Central Building District having been built apparently over a former course of the Hunter River, where it flowed into the sea.

A considerable amount of damage was caused to buildings in Newcastle .... in particular to the Newcastle Workers Club in King Street, where nine people died as the result of injuries sustained when that building partly collapsed. Exhibits 63 and 64 graphically depict the devastation to the Workers Club. In Beaumont Street, Hamilton, a number of buildings suffered damage. They were of old construction. The lime mortar used was not a strong bind, and if the cavity brick walls had ever been tied, which seems unlikely, those ties had disappeared due to corrosion. The outer skins of the walls onto Beaumont Street fell, crashed through awnings or carried awnings with them, and three persons were killed by the falling masonry. Exhibits 14-18 illustrate the damage.

Other buildings throughout Newcastle were damaged, but there were no other deaths due to injury. The other fatality attributed to the earthquake was that of Mrs Watson, whose experience led to a fatal stroke on the following day. The various types of damage are exemplified in Professor Melchers Committee Report Exhibit 114.

There is evidence that 162 persons were injured and treated at hospital as a consequence of the earthquake.

It has also been said that about $800 million worth of damage to property was caused.

Survivors have given us vivid details of the immediate effects of the earthquake (see e.g. evidence of Wayne Dean and Lynette Brown at the Club, and Sue Howarth at Beaumont Street), supplemented by evidence of the early rescue unit arrivals (FOs McIvor and Hitchcock).

All the witnesses described the effect of the earthquake upon themselves.

I might as well place on public record, as an example perhaps of the abuse of power, my own experience of the earthquake.

I was seated at my desk in my chambers at the Coroners Court, Parramatta Road, Glebe. I felt the floor beneath me tremble, I heard a rumble, and my chair moved a few centimetres and struck the desk.

Thinking that perhaps our boilers had blown up, I descended to the basement, but all was well. By the time I returned upstairs, staff had resorted to their wirelesses, and were able to tell me that an earthquake had occured at Newcastle.

On the night of the earthquake I was advised that the Attorney General had requested that I attend the scene if possible, and the following day I came to Newcastle with the Deputy State Coroner, Mr Derrick Hand, Constable Surplice of the Coronial Investigation Unit, and Ms Lynelle Osburn-Gard, then a grief counsellor of the Division of Forensic Medicine at Glebe.

THE OBJECTS OF THE INQUEST

At the commencement of the inquest on 2nd July last, I outlined the purppses in holding this inquest. In brief they were -

1. As this was the first time in recorded history that death had resulted from an earthquake in Australia, it was desirable to record for posterity the full facts;
2. The deaths were violent and unnatural, and occurred under unusual circumstances, so satisfying various criteria under the Corroners Act, 1980; and
3. It seemed appropriate to provide evidence, at a public forum, to describe the event, and to explain to the people of Newcastle the seismological and engineering implications of the event.

It was also foreshadowed that the hearing may touch upon certain well-publicized criticisms which became notorious in February, 1990 and which reflected upon all rescue services except the Fire Brigade, and hope was expressed that there may be some rapprochement among the services as the proceedings progressed.

SEISMOLOGY:

Our expert witness Kevin McCue, Senior Research Scientist with the Australian Seismological Centre, Canberra, provided professional testimony to the inquest on the causes and effects of earthquakes. I also sought the assistance of Dr John Rynn of the University of Queensland, whose report is Exhibit 132. It is apparent that the understanding and study of these phenonema are still in their infancy, owing to the lack of proper measuring and scientific instruments before the commencement of this century.

An earthquake is a "ground-shaking" event caused by build-ups of stresses where there are weaknesses in the earth crust. The stress can cause rocks of the crust to fail and the earth "snaps". This is the earthquake (Dr Rynn) -

Australia is regarded as low-risk so far as damaging earthquakes are concerned. The type of earthquake experienced in this country is not the tectonic plate type and is sometimes called a "soft crust" or "intraplate" earthquake. "Tectonic plate" types are those experienced in California and New Zealand, where "plates" or layers of rock collide, and force earth upwards and outwards. The Newcastle earthquake was a "thrust fault", typical of Australian earthquakes, and in this case exaggerated by the thin layer of alluvial soil and filled areas, on which much of inner Newcastle was constructed.

Earthquakes are often followed by after-shock activity which is of a scale about 1 unit of magnitude below the original disturbance. Usually there are many after-shocks. In the case under inquiry, Mr McCue regarded it as extraordinary that there was only one, possibly two, aftershocks. The one which certainly occurred was of a magnitude of only 2.1 and occurred within the week following the earthquake. At that level it went un-noticed by the citizenry. Mr McCue describes the lack of aftershock activity as remarkable, comparing it with 60 aftershocks within 24 hours up to scale 3.5 following a similar sized earthquake at Picton in 1961. The many aftershocks following the recent earthquake of enormous consequences in Iran, (40,000 to 50,000 killed) were also mentioned in evidence.

Mr McCue said that on 29/12/89 he advised the Lord Mayor that special care should be taken, as a 4.5 aftershock could be expected within 1-7 days after the initial shock.

Newcastle has suffered 4 damaging earthquakes since white settlement - 1842, 1868, 1925 and 1989. 1989 was the largest.

It is impossible in the light of current knowledge, to predict with any large degree of probability whether or when, another seismic event will strike Newcastle. Mr McCue said that at worst, there is about a 65% chance of an intensity 6 earthquake near the area in the next 55 years.

Sydney and all other capital cities are considered to have been erected in safer geophysical areas than Newcastle, and so are less likely to be earthquake- affected, with the possible exception of Adelaide.

Other evidence showed that there is far greater earthquake activity in Australia than the ordinary person may have thought. (See figure 1 of Exhibit 7.) Indeed, the evidence was that there are 55 occasions on which earthquakes have been felt within 100 km of Newcastle since 1950. It is comforting to record that most of these are small, and most of the larger ones in Australia have taken place in uninhabited districts.

It has been shown that there was no seismograph in Newcastle to record local tremors. That at Riverview College in Sydney was the nearest. This omission has now been rectified.

ENGINEERING

Expert evidence in relation to the damage to buildings in and around Newcastle resulting from the earthquake was sought from the local firm of Rankine & Hill and provided by them (Exh 104). Their report was oversighted by Professor Melchers of the University of Newcastle Department of Civil Engineering and Surveying (Exh 113). The object of these exercises was to try and explain to the Newcastle community in simple terms why some buildings failed and others did not, with special attention being paid to the fallen facades of Beaumont Street and the 1970-1972 extensions to the Workers Club.

In Beaumont Street, Hamilton, numerous buildings suffered damage typically of the upperstorey of a two level building losing all of the front skin of the facade brickwork. Three people were killed when these bricks either fell through the awnings beneath them,or brought the awnings crashing to the ground with them, onto those persons. These fatal accidents occurred at the Kent Hotel, Anderson's Pharmacy and Soul Pattinson's Pharmacy. Photos of the damage appear in Exhibit 32. The evidence showed that the brickwork in these cases was more susceptible to damage because it had lime rich mortars, and the bricks either had never been tied between the skins, or that any such ties had long since corroded and disappeared. Horizontal support for the bricks was inadequate to withstand the forces of the earthquake. It was also found that the hanger rods of the awnings were not properly affixed to the buildings, substantially reducing their abilility to withstand the impact of the falling bricks. It would appear that the old style posts which were once used to support street awnings provided better stability.

The Newcastle Workers Club's 1972 extensions provided the most spectacular building collapse, which was responsible for the loss of 9 lives and many injuries. Some three hundred

people, mostly elderly, were in the club at the time, although the timing of the tremor meant that, fortunately, it was not particularly crowded when the disturbance occurred. Mr Kevin Charles Spring, a principal of Rankine & Hill Ltd based in Wellington, New Zealand, presented the evidence on behalf of that firm (see exhibits 103 and 104). He is an expert in earthquake design and construction. Mr Spring's conclusion was that there was inadequate and brittle support to the western wall of the Club, and that the collapse of the masonry of that wall into the floor below caused the failure of that slab, which in turn fell onto the slabs below that through the height of the building, and into the basement. Mr Spring agreed under examination that if all the bricks had fallen outward and not inward his opinion was untenable. It is not clear to me on the evidence just what proportion of bricks from this wall fell inside the building or outside. Mr Spring did not agree with the "soft storey" theory, namely that a rigid upper storey suffering horizontal forces might create a weakness in those below, in this case the ground floor, and cause a failure there (see exhibit 108), but did not offer any real grounds for his rejection of that possibility. An addendum to his report was received yesterday, and included among the documents marked "D". He says that some bricks certainly fell into the club, and maintains his opposition to the soft storey theory.

Professor Melchers agreed with Mr Spring's interpretation of the mechanism of failure of the Club, particularly that the loss of lateral support of the western masonry wall was the triggering event. He thought there were shear failures due to massive downward pressures on the concrete slabs, and that the falling bricks theory made good sense. However, he conceded that the ground floor parking area could well have acted as a "soft storey", initiating the failure of the western wall. Professor Melchers described how the oscillating forces acted upon the alluvial soil and had oscillating effects on the building so that it reacted "like jelly in a bowl" in his memorable phrase. The high water table may have added to the effect. Professor Melchers also submitted a late document, being an enhancement of exhibit 114 also included in the documents marked "D".

In 1970, when the extension was commenced, there were no earthquake design requirements in existence in Australia. In 1979 the first earthquake design code was issued (AS2121), creating 3 zones, 0, A and 1, in ascending order of magnitude of assessed risk. Newcastle was placed in zone 0, which meant that no specific precautions had to be taken with regard to buildings like the Newcastle Workers Club. Both Mr Spring and Professor Melchers stressed this fact, the implication being that no fault could be attributed to any architect or structural engineer for failing to take earthquake activity into account in relation to buildings like the Workers Club back in 1970-72. This was not the approach of Mr Kerr counsel for some of the victims, whose cross examination was directed at placing a duty upon those professionals to discover and pay regard to previous tremors dating back to the 19th century when designing and erecting the edifice in question. He was also critical of the Council for approving the building as structurally adequate at various times during the 1980s. Whether any breach of duty is shown is of course a matter for our civil courts and not for a coroner, unless of course the breach is so grave that it amounts to a crime, which is obviously not the case here.

A team chaired by Professor Melchers, under the auspices of the N.S.W. Government and the Institute of Engineers, has prepared a comprehensive report on a variety of aspects of the earthquake (exhibit 114). This report was completed in March, 1990 and was released publicly in May, 1990. It details damage which occurred in places other than Beaumont Street and the Newcastle Workers Club as well as that which occurred at those places. The report is extremely valuable, its findings and recommendations are concisely set out in pp vii to xiv,(ppix to xx in the revised version), and I will not attempt to paraphrase them here, but they deal with important topics like earthquake design, domestic construction, special function buildings, heritage buildings and even insurance. It is currently being studied in the appropriate Government Departments. A particularly important recommendation is that Newcastle be rezoned to A so far as minimum structural engineering design is concerned, except for alluvial and/or filled areas where it should be zone 1. This recommendation is supported by this Inquest.

THE CRITICISMS:

It is an important function of Court hearings like Inquests to isolate issues which are important. It is often possible also to defuse the more controversial of these issues, and that is what has happened in this case.

A number of matters were publicized following the leakage to the media of the 17 page document being a precis of the Newcastle Fire Brigade debrief, which has been referred to in the evidence and in statements and other documents which are part of the record of these proceedings. Most of these matters did not require the attention of the court, but some are important and had to be addressed. In particular there were grave allegations:-

(1) that rescue workers were withdrawn from the site without reason, resulting in victims being abandoned;

(2) a wall was demolished and allowed to fall onto a place where victims were still alive; and

(3) Fire Brigade Officers were not fully utilised at the scene.

WITHDRAWAL OF RESCUE PERSONNEL:

As to (1) it has been proved, and conceded, that at the times when orders were given to evacuate the area, information had been given to Police Officers currently in charge (a) that an after shock could be expected at any time, and probably within 12 hours, (b) a structural engineer had advised that the building was unsafe, and (c) that slabs which had collapsed within the building were moving.

In the event, only one minor after shock was recorded, and there is some doubt that the slabs were in fact moving - but the important fact is that these pieces of intelligence were passed on to the officer in charge of the disaster scene at the time. It was in the light of that advice that decisions had to be made.

There were differences of opinion among rescue workers themselves, e.g. S.O. Parker believed that to leave many rescuers within the building was an acceptable risk, despite the professional warnings, whilst Ambulance Paramedic Mr Borgen thought the rescuers were in extreme danger.

Official books of instruction accentuate the desirability of preserving the safety of the rescuers.

Ambulance Officer and S.C.A.T. member Mr Harrold said it was unforgivable for a rescuer to become a rescuee.

The Police Regulation Act, 1899 was amended by Act 88 of 1988 which inserted S.7B into that statute. This section gives the authority to a police officer of the rank of sergeant or above to direct persons to leave or not enter any danger area, for the purpose of protecting persons from injury or death.

On 28th December, 1989, the Police Officer in charge at the scene (who was not the same police officer at all times) was seized of numerous pieces of information as I have said, which included (i) that an aftershock was imminent, (ii) that ambulance officers were of the opinion that the fallen slabs were still moving, and so unstable, and (iii) the opinion of a structural engineer, Mr Robert Sirasch, that the structure was bowed, cracked, unstable and unpredictable.

On that advice he could have made three decisions, as I see it -

(1) Allow a full allocation of personnel within the building for search and rescue operations, and take the risk that many rescuers as well as victims might be killed or injured by further falls of masonry;

(2) Withdraw all personnel until the building had been rendered perfectly safe, thus ensuring the safety of rescuers but exposing victims still alive to greater threat to life; or

(3) Allow restricted access to the site, to expose a minimum number of rescuers to danger but to provide life-saving assistance to victims still trapped in the wreckage.

It is obviously unfair to criticize, in hindsight, whatever decision was made by that Officer in Charge; but whether using foresight or hindsight, in my view the decision to allow restricted access was reasonable then and appears reasonable today. Indeed, it seems even today to have been the best decision.

Of course, Police claim that many people within the wrecked building were not pursuing active rescue work when ordered out, and this fact provided addition reason for their removal from a place of potential danger.

TAP AND LISTEN AND DEMOLITION OF WEST WALL:

Late on the afternoon of 28th December, Tap and Listen exercises were conducted to try and locate surviving victims. The teams were drawn from volunteers from all rescue services. Various areas were searched and tapped. Responses were reported but it is now apparent that whatever noises were heard, they did not emanate from live victims.

There was always doubt that the responses were those of trapped people, because:-

(a) of the variety of responses described, e.g. woman's voice, a moan, taps, "noises" and "responses" undefined; and

(b) when searching was stopped so that the whole team could listen, no responses were heard.

However the mere suggestion that live people were left to their fate was so serious that I concluded that the matter should be investigated to the utmost. To this end, the post mortem reports were provided to Dr J. DuFlou, Deputy Director of the Division of Forensic Medicine, and an opinion requested from him as to whether it was possible that any deceased victim was still alive at the time of the tap and listen exercises.

Dr DuFlou expressed his firm views that the injuries suffered by each deceased were so severe that death would have ensued within minutes of their infliction, which was at the time of the initial collapse after the earthquake. This opinion is unchallenged, and accepted by Counsel at the bar table.

It follows that no person was alive and responding to the "tap and listens".

Doubtless there is a great desire on the part of rescuers to hear responses to their efforts. Some of them believed they heard responses. They may well have heard noises. Their sensing of replies may have been born out of wish-fulfilment.

No criticism is made of those rescuers, but it is vital for the relatives and friends of the deceased to know that their loved ones were not abandoned whilst there remained the possibility of finding them alive.

Likewise when the leaning wall on the North West corner was demolished later that night, it had been correctly decided that no living victims remained at the disaster site.

UNDER-UTILISATION OF FIRE OFFICERS.

It is difficult to decide, and in any event not really necessary to decide, whether or not the fire officers were under-utilised at the disaster site.

Fire officers were first upon the scene. More arrived later. Upon the advent of the Police Rescue Squad later in the day, doubtless some of those members were used in place of firemen.

Police are placed in charge of such an emergency, and perhaps it is natural for one service to turn first to its own to get things done. Certainly, from a disciplinary point of view and to retain proper chain of command, it is probably easier to direct one's own subordinates.

Problems which may be expected to arise from the use of an eclectic rescue force are elaborated in his paper by Mr R.J. Heath, of the Department of Commerce, University of Queensland, which he volunteered to the Minister who referred it on to me. It is marked exhibit 167.

The State Rescue and Emergency Services Board is aware of the situation, and will use its best endeavours to promote greater understanding and co-operation among the various units.

MR ALBERT BENDER

I feel that it is necessary to mention the case of Mr. Bender. He was pinned by wreckage and could not be extracted in the circumstances then existing. A number of people were attending to him and giving him medical attention. Mr Bender was bleeding copiously from a leg injury, to the extent that he was losing blood faster than it could be infused into him.

At this time Chief Inspector Cleary ordered all personnel from the rescue site on safety grounds, and this order was complied with, apparently without demur, by those treating Mr. Bender. After a briefing of some 10-20 minutes the rescuers returned to Mr Bender and found him to be deceased.

Inspector Cleary said that he was unaware of Mr. Bender's predicament when he gave his order, and I accept that evidence. It is also clear on the evidence that Mr. Bender was then unconscious, and that his life could not have been saved.

Nevertheless, I am sure that we all feel a touch of sadness that Mr Bender was left helpless in his dying moments. This was perhaps the most unfortunate incident during the disaster, although no blame can be attached to any individual in respect of the matter.

THE THIRTEENTH VICTIM:

The family of Mrs Levener Georgia Watson asked early in January, 1990, that her name be added to the list of victims. Mrs Watson died the day after the earthquake of an intracranial haemorrhage brough about by her high blood pressure, and it was not an easy task to decide whether her death could be said to be a direct consequence of the tremor, or whether it was too remote.

Evidence was taken on the point, and for the reasons which I gave on 16th July, 1990, I have accepted as having been proved that it was probably the earthquake which triggered stress responses which led directly to the stroke suffered by Mrs Watson. So it was that 12 victims became 13.

The incident was therefore quite a disaster in Australian terms, although I suppose it pales by comparison to recent earthquakes in Iran and the Philippine Islands. One wonders how the Coroners in those places are able to cope with their workloads.

LEGISLATION.

The State Emergency Service Act 1989 was proclaimed to commence on 14/12/89. That Act repealed and replaced its predecessor. The State Emergency Service is set up, and its functions are described in section 8. One of those is "to assist, at their request, members of the Police Force, Fire Brigades, Bush Fire Brigades or Ambulance Service in dealing with any incident or emergency."

The State Emergency and Rescue Management Act 1989 was proclaimed to commence in part on 12/2/90. One part which did commence then was Part 3, which set up the State Rescue and Emergency Services Board and outlined its functions.

The Board consists of the State Emergency Operations Controller, the Director of the SES, and a senior officer from Police, Fire Brigade, Bush Fire Brigade, Ambulance Service and Volunteer Rescue Association.

The Board is subject to Ministerial control (S.45). The functions of the Board are

(a) to control and co-ordinate the rescue agencies in connection with rescue operations; and

(b) to ensure the maintenance of efficient and effective rescue service. (Sec 47).

Section 48 sets out the particular functions of the Board, which are very comprehensive and include matters of policy and planning relating to rescue services.

QUO VADIS:

Despite the apparent normality of this hearing, we should be aware that it has constituted an historic occasion. This is the first inquest ever to take place in Australia concerning the death of any person resulting from earthquake activity.

It follows that the whole episode has been a learning experience for everyone who played any part in the consequences, from the first rescue officer on the scene, to the Coroner and counsel attending the inquest.

In the drama and emotion and uniqueness of the occasion, it would be unreal to anticipate that all human beings would conduct themselves with 100% efficiency and 100% consideration for their fellows for 100% of the time. Defects in equipment and procedures could be expected, and no doubt occured.

As a means of improving techniques and procedures, debriefs wereconducted by the Fire Brigade and by Police, and a full public debrief involving all the services was held at a later date.

The main purpose of debriefing exercises is to pinpoint any defects revealed by the incident, so that they may be eliminated before there is any repetition of the calamity. It is now apparent to all, that debriefs should not be used solely for the purpose of letting off emotional steam, and that what is officially recorded should be confined to those subjects which lend themselves to improvements in future operations. The method adopted in this instance of making a formal record of every utterance at the meeting of Fire Brigade Officers allowed some mischievous person to leak a precis of the document to the media, to the detriment of every rescue service used at the devastation of the Newcastle Workers Club.

It is of no benefit to anyone to derogate from public faith in the efficiency of our rescue services, especially when the criticism turns out to be unwarranted, as in this case.

We know now that at the scene of the wreckage of the Workers Club, people of all walks of life and of all rescue services worked wholeheartedly and bravely to try and save survivors and locate bodies. Decisions were taken on good grounds. No life was lost which could have been saved, and no

rescuer was seriously injured. All rescue services had their heroes.

It was disappointing then to see and hear published in February, 1990, material in the leaked document which presented our rescuers in an entirely different light. The erstwhile heroes were made to appear to be petty squabblers. One can only suppose that the clandestine supplier of the summary had no appreciation of the damage he was doing, particularly to his own unit, whatever that was.

That damage is capable of repair, though, and I am hopeful that this inquest has played its part in the promotion of that reparation. I refer to the document Exhibit 120, where the more serious of the published allegations are withdrawn or watered down, and which I hope will herald a resumption of harmonious relations among services, especially between the Fire Brigade and Police. I formally congratulate counsel for the Fire Brigade and the Fire Brigade Union in achieving this breakthrough.

The statement of Major General Howard, (Exhibit 168) addresses the problems of liaison and communication, and postulates that recent changes in administration and procedure will, with the co-operation of all services, have a significant effect in reducing these difficulties. I believe there is room for optimism in this regard.

COMMENDATIONS:

I have been asked during the case to make special commendations in respect of certain persons, naming them for bravery or special devotion to duty. One could do this quite easily, citing persons from the medical and nursing professions, Fire Brigade, Police and Ambulance services. However, in doing this one might well cause offence by omitting the names of others who may have worked equally courageously, but anonymously. It is also apparent that Club employees and other civilians have done good work when the collapse first occurred. Mr Norm Duffy, himself in dire straits, encouraged and fortified nearby victims. Others may have entered dangerous buildings in other areas, but have not been recognised at this inquest as no deaths occurred there.

For these reasons I will not formally name individuals, but content myself with congratulating every person from whatever background for the splendid efforts made by them to alleviate the suffering of their fellows injured during the horror of the earthquake. Feats of gallantry were numerous, and it is uplifting for the rest of Australia to see how a community like Newcastle can respond to a shocking calamity.

Let us hope that the bonding and communion of spirit which has followed the earthquake will carry Newcastle through a period of regeneration to a secure and happy future.

JOBS WELL DONE:

I think it should be formally recorded that many people have done an enormous amount of work in connection with this case. Although an inquest would have been held in any event, the publication of criticisms of rescue efforts created unnecessary and awkward problems, and presented to the public an image of all our rescue services which was highly undesirable, and misleading. The events of 28th December, 1989, proved that all services were capable of a sustained, dedicated and successful operation aimed at saving lives, and were capable of working together to achieve that end.

A very great effort went into establishing by proper means that the most serious of the criticisms were misplaced. This was accomplished. A number of conferences have been held both before and during the hearing to try and overcome the resentment created by the leaking of the summary of the debrief, and to mend bridges generally. It is my belief that these goals have been largely attained, and I again thank counsel for the Fire Brigade, Mr. Stewart, whose production of the document Exhibit 120, effectively withdrawing the most serious of the published allegations, has moved us a long way towards achieving the rapprochement I mentioned at the commencement on the Inquiry.

I would also like to give special thanks to Mr Mater, counsel assisting, whose painstaking attention to detail is legendary; to Mr Rustuccia instructing him; to Constables Baldwin and Surplice of the Coronial Investigation Unit, both of whom put in many long, hard hours on the case; to Det.Sgt. Young who so capable handled the Newcastle end of the investigation; to Constable Parkes of the Physical Evidence section, and to Constable O'Mara and Mr O'Mara for the excellence of the models of the club building which were used daily.

I also thank counsel for the erudition and courtesy demonstrated at the bar table.

RECOMMENDATIONS:

As a matter of practice it has been highlighted during the case that it is important to designate an officer - either of the attending Police or of the Coronial Investigation Unit - to keep a log of important events during the crisis, e.g. location of bodies, assumption of authority, demolition of buildings, use of machinery and other devices - and so provide a chronology which would prove useful at a later hearing. There is no need to make any formal recommendation in connection with this topic, but is something for myself and the Unit to take into account in any future catastrophe.

It came to the fore during the hearing that some differences of opinion between services as to the use of equipment at the scene emerged. As I said then, and I reiterate now, what equipment is used is a matter for the emergency services to decide, and whether to use it or when is a matter for the person in charge at the scene, preferably after appropriate liaison with the heads of other units. I do not regard it as the function of the coroner to dilate on these bread and butter issues.

In a similar vein are the comments regarding the failure of telephones and radio equipment in the early stages of the emergency. These initially broke down as a direct result of the earthquake, but problems in communication emerged during prior disasters. I expect the Police to have directly attacked the issue, and have expert advice as how to overcome the problems, and do not feel the Coroner should have to make any formal recommendation about this fundamental need.

It has been suggested by Mr Stewart that a Council engineer should be available to attend disaster scenes involving structures, and give advice to rescue officers there. This idea has merit. The Council engineer would be expected to have access to plans relating to the fallen building. I will make a formal recommendation in this regard.

The excellent work of Professor Melchers and his committee of the Institute of Engineers, Australia, is under present consideration by the N.S.W. Government. The issues addressed and recommendations made are extremely wide-ranging, and I would not seek to impose my views on this expert material. Apart from a couple of issues I will leave it to the professionals to arrive at the right conclusions, no doubt taking cost-benefit

factors into account.

There are two matters though, which cry out for definite action, and I make formal recommendations in respect of those:-

1. That the Australiam Earthquake Code AS2121 (1979) be revised, at least in so far as Newcastle is concerned;
2. That engineering and architectural courses be reviewed so as to introduce the study of earthquakes and their effects upon structural engineering design.

In respect of the summoning of the Council engineer I make the formal recommendation:-

3. That the State Rescue and Emergency Services Board confer with the Department of Local Government with a view to formalising a procedure whereby the Engineer of the Local Council may be summoned to a disaster site for the purpose of giving advice to senior rescue officers as to the structural integrity of buildings.

I announce my findings.

FINDINGS:

Albert Gavin BENDER

On 28/12/89 at the Newcastle Workers Club, King Street, Newcastle, died of hypovolaemic shock due to severe blood loss following multiple injuries sustained then and there when an earthquake occurred, causing the collapse of parts of the building.

Peggy Tresa STONE:
Verlena Maree MARCH:
John Anthony O'SHANASSY:
Eileen Mary WERREN:

On 28/12/89 at the Newcastle Workers Club, King Street, Newcastle, died of traumatic asphyxia and multiple injuries sustained then and there when an earthquake occurred, causing the collapse of part of the building.

Carol Ann COXHELL:
Barry Francis SPARK:
Miriam DUFFY:
Leonard Charles NORRIS:

On 28/12/89 at the Newcastle Workers Club, King Street, Newcastle, died of the effects of multiple injuries sustained then and there when an earthquake occurred, causing the collapse of parts of the building.

Dulcie Alice BLIIM:

On 28/12/89 at Royal Newcastle Hospital Newcastle, died of the effects of multiple injuries sustained earlier that date in Beaumont Street, Hamilton, when an earthquake caused a collapse of the outer skin of a wall of a building, which fell onto the deceased.

Cecil Robert ABBOTT:
Cyril Keith McMAHON:

On 28/12/89 in Beaumont Street, Hamilton, died of the effects of multiple injuries sustained then and there when an earthquake caused a collapse of the outer skin of the wall of a building, which fell onto the deceased.

Levener Georgia WATSON:

On 29/12/89 at Royal Newcastle Hospital, died of an intracranial haemorrhage, probably suffered as the result of raised bloodpressure caused by stress following the Newcastle earthquake of 28/12/89.