The Editor AEES Newsletter
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AEES is a Technical Society of IEAust
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2/97

AEES Newsletter

Contents

AEES 1997 BRISBANE QUEENSLAND

Date: 2 & 3 October 1997
Place: University of Queensland

Theme - "Earthquakes in Australian cities - Can we ignore the risks?"

The lack of awareness of the earthquake loading standard amongst practising engineers was bemoaned by the Society's Treasurer John Wilson, in a recent article in Engineering Times. This conference seeks to publicise the fact that Australian cities are exposed to earthquake risk and that engineers, local government planners, insurance companies and emergency services personnel, should be more aware of this fact. The question of how to deal with the risk must also be addressed.

The Annual General Meeting of the Society is to be held following the proceedings on the first day and prior to the Conference Dinner. Abstracts of proposed presentations should have reached Barbara Butler no later than 6 June 1997 (by mail at PO Box 829, Parkville, Victoria 3052, by Fax on 03-9348 1524 or email on Barbara_Butler@muwayf.unimelb.edu.au).

For those with Internet access, a web page has been set up to provide the latest details from the Organising Committee: (http://QUAKES.earthsciences.uq.edu.au/AEES.html)

Student members of the Society intending to attend may be eligible for a travel subsidy from AEES. Interested students should send applications to Barbara Butler at the Secretariat (address above).

Editorial Note It is now time for the selection of a National Delegate and Deputy Delegate to the International Association for Earthquake Engineering. The position can be held by one delegate for no more than 8 years (two terms) and Kevin McCue has officiated as the National Delegate at the past two World Conferences on Earthquake Engineering in Madrid and Mexico City in 1992 and 1996. The delegate or deputy will hold the post for 4 years and represent the AEES at the meeting of delegates in New Zealand at the next WCEE in the year 2000.

Your Society - AEES

Executive:
President: Prof Graham Hutchinson[1]
Secretary: Mr Gary Gibson[2]
Treasurer: Mr John Wilson[1]
Immediate Past President: Mr Charles Bubb

Committee:
Russell Cuthbertson (Qld)
Peter Gow (WA)
Vagn Jensen (Tas)
Bill Buckland (NSW)
Mike Griffith (SA) and
Kevin McCue (ACT)

[1] Civil & Environmental Engineering Department, Melbourne University, Parkville, Vic 3052
[2] Seismology Research Centre, RMIT Bundoora, Vic 3083

Letter to the Editor

Editor
Your readers might be interested in this note I gleaned recently from the internet:
I saw in a recent issue of Science that the USGS had recently released a new set of national seismic hazard maps, updating the 1970s map published in Bolt's Earthquake book. They are on the Web at http://wwwneic.cr.usgs.gov/eq/finmaps.shtml#national (Ed. - see p3 of this newsletter).
These reflect some new data about increased risk in the Pacific NW and Tennessee. Some other interesting features in these maps:
• There is NO state in the USA free of risk.
• Ten states in the Great Plains and Gulf Coast have relatively low risk.
(I guess you have your choice of tornadoes & hurricanes versus quakes. :- Richard Ottolini, Stanford)
Looks like the end of good old Zone Zero!

Cheers
Charles Bubb

NUGGETS FROM THE NEWSGROUP A REGULAR FEATURE BY CHARLES BUBB

From: Susan Hough hough@amelia.gps.caltech.edu
Subject: Re: Seismograph question
To: sci.geo.earthquakes
Mike (mike@phy.auckland.ac.nz) wrote:
Just out of curiosity, what is the most accurate way to determine the epicenter and the focal length of an earthquake nowadays? How much data is usually needed to obtain an accurate estimate?

Not a trivial question. Hypocenters are constrained from 'first motion data', mostly very precise measurement of the arrival time of the P wave at different stations. With 4 stations, you can get a unique hypocentral location, except that uncertainties of various types abound and so you do much better with much more data. The actual determination of hypocenter from arrival times is the subject of numerous papers. Some very high resolution methods have been developed to determine relative locations of nearby events with cross-correlation analysis & the like, but these typically can't be applied to generic network data sets (they also get relative location much better than absolute location). Typically, depth is harder to constrain than is horizontal location.

If, by focal length, you mean rupture extent, this is another non-trivial data. For an earthquake like Northridge, you can start to invert for the rupture history with as few as maybe 4-6 strong motion recordings, preferably scattered at different azimuths. Again, the more data, the better you generally do. Smaller events are more difficult, but then only esoteric high frequency seismologists tend to care about their rupture dimensions anyway. The main stumbling block here is resolving the effects of the finite rupture from the effects of attenuation and site response...if anyone cares, ask me & I can talk ad nauseum on this particular subject.
Sue, speaking for myself.

Determination of focal depth is difficult, that of the Newcastle earthquake was only determined at 11 to 13km by virtue of seismological data from Scotland! Originally it was thought to be shallower.

Intraplate earthquakes In the early 1800s three major earthquakes shook the American midwest near New Madrid and Charleston, their magnitudes were in the range 7.5 to 8.0 (New Scientist 13 April 1996 p17.).

This thread on intraplate earthquakes was triggered by a question from Steve who wrote:
>>I've read much about earthquakes, but little to
>>nothing on 'intraplate' earthquakes. I live on the
>> east coast where nobody talks about earthquakes,
>> although they have happened here. Are there any
>> theories on this subject. If so, I would find them
>> most interesting.
Monday, 12 May 1997
From: michael@andreas.wr.usgs.gov
Subject: Intraplate Earthquakes

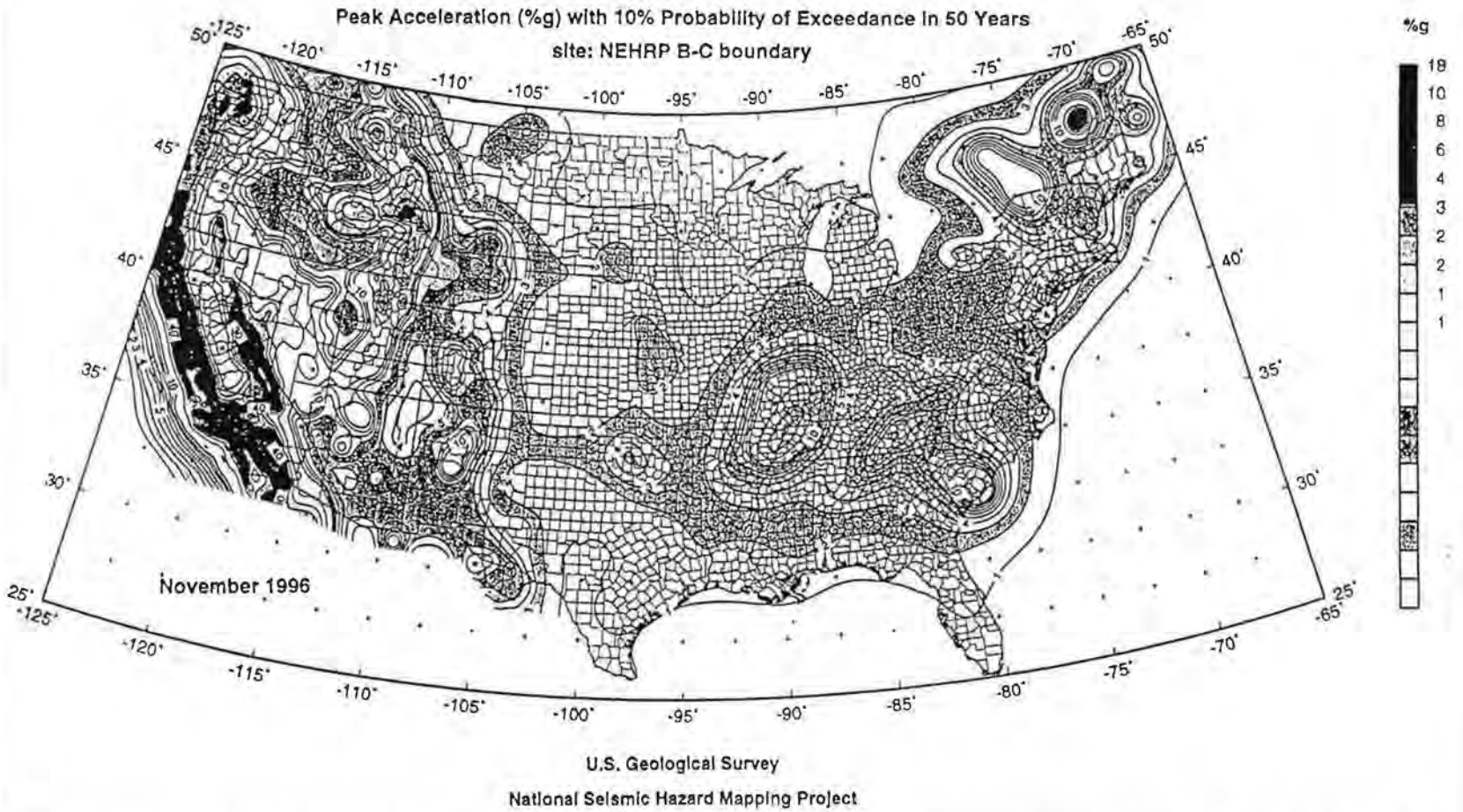
Philip L. Fradkin wrote:
> My guess is that for intraplate quakes, such as New
> Madrid, a lot of individual case work has to be done
> to determine what causes those quakes, while those
> on plate boundaries are shucked off onto plate
> tectonics. Again, my guess is that more hasn't been
> done on intraplate quakes as a whole, or even
> individually perhaps, because they are the greatest
> threat to the validity of plate tectonic theory; and
> there doesn't seem to be any replacement for that
> theory in sight.
Actually there is a large body of work on intraplate stresses and plate tectonics. See work by authors like Mary Lou Zoback and Randy Richardson (on World Stress Map). I think everyone has gotten over the idea that plates are completely rigid and all deformation takes place on narrow plate boundaries. However, a high enough percentage of the deformation occurs in narrow zones so that the concept of plates and plate motion is still useful.
From: Andy Michael michael@andreas.wr.usgs.gov
Organization: University of California, Davis

Tuesday, 13 May 1997
From: gerard@hawaii.edu
Subject: Intraplate Earthquakes
In article <337646EA.5970@nbn.com>, "Philip L. Fradkin" <filfrad@nbn.com> writes:
> I think Steve has a good question. You hear a great
> deal about quakes on plate boundaries, but much
> less about intraplate quakes. The most frequently
> cited intraplate quakes are New Madrid and
> Charleston. I have been reading a fair amount on
> the earthquakes in China, those most devastating
> of all in terms of fatalities, and every once in a
> while there is mention of faults but no mention of
> what caused the faulting.

China suffers from a diffuse plate boundary, partly a consequence of the Indian collision with Asia. Even though plate tectonics seems to have all the answers, those answers are coming very slowly now that the obvious stuff has been explained. For example, it wasn't until the Okushiri earthquake of 1993 that the penny finally dropped that the plate margin between North America and Asia actually runs through the Sea of Japan (making Kamchatka, far eastern Siberia, the Sea of Okhotsk, and Hokkaido all part of the North American plate).

Far from being a problem for plate tectonics, the Charleston earthquake has led to the discovery that in the initial rifting of the Atlantic there were places along the continental margin where there were massive igneous intrusions and extrusions, and that lithospheric failure from loading (a la the Hawaiian earthquakes of 1871 and 1938) is a small but significant risk. New Madrid has been explained as a failed rift.
Where there is data the stress directions in Mary Zoback's world stress map are largely in agreement

New Map of Earthquake Hazards



After three years of compiling data from more than 500 faults and applying new hazard assessment techniques, the U.S. Geological Survey (USGS) has produced new seismic hazard maps for the continental United States. The map shown here provides estimates of earthquake ground accelerations (as a percentage of g, the acceleration of a falling object due to gravity) having a 10% probability of being exceeded in 50 years. The map is based on seismicity and fault-slip rates, and it accounts for the frequency of occurrence of earthquakes of various magnitudes. According to the USGS and the California Department of Conservation, which collaborated on a joint hazard assessment for California, more than 70% of California's population lives in an area where high levels of ground shaking could occur in the next 50 years. This map, and others showing different parameters and probabilities of exceedence, can be found on the World Wide Web at http://geohazards.cr.usgs.gov.
[Map courtesy of USGS; text by Michael Carlowicz]

with what you would expect from plate tectonics, including China and the central US (and Australia - Ed). Heck, even the giant diffuse seismic zone from Tonga to Yap (as intraplate as you can get) makes sense: a new subduction zone is trying to form.
The postmodernists tell us geology is ripe for a paradigm shift, but I don't believe them.
Gerard Fryer
gerard@hawaii.edu
http://www.soest.hawaii.edu/~gerard/
Personal views only.
Organization: U Hawaii Manoa; School of Ocean & Earth Science & Tech

Friday, 16 May 1997
From: Harold.W.Asmis@hydro.on.ca
Subject: Re: Intraplate Earthquakes
Richard Ottolini wrote:
> Some explanations for 10% of earthquakes that do
> not happen on plate boundaries:
> 1) Micro plates (circuclar definition since seismicity
> is used to define plate boundaries.)
> 2) Fossil plate boundaries, e.g. associated with the
> creation of the Appalachians.
> 3) Internal plate stresses and strains.
> 4) Glacial rebound- slow upward movement from
> ice age sheets melting 12,000 years ago.
> 5) Volcanism.

...Water. Eastern North America (ENA) can be considered as one big piece of highly-stressed particle-board. Drill and inject anywhere and you get an M5+ earthquake. It's really tough to explain our active zones, for if you had a weak spot in the board, it would soon get relieved and arched over (like a drilled hole). Some of the ENA seismic zones are so active that people would postulate that there should be a mountain range there, and the fact that there isn't just means that it only became recently active. Unfortunately, paleoseismic evidence (ditches through sandblows) shows that these places have been active a long time and they're flat as a pancake.
Harold W. Asmis harold.w.asmis@hydro.on.ca
(Ontario Hydro Canada - Ed)
tel 416.592.7379 fax 416.592.5322
Standard Disclaimers Apply

In the following discussion on plate tectonics R M Mentock compares the field to early astronomy before Newton. Jonathan King asks what would the Newton of plate tectonics be doing? Plenty to do yet says Mentock. Now read on.

Sunday, 11 May 1997
From: RM Mentock,Mentock@mindspring.com
Subject: why plate tectonics cannot be ignored
Jonathan King wrote:
>> RM Mentock writes:
>>The situation is similar to astronomy. Wegener,
>>who postulated continental drift, would be
>>Copernicus. Morgan, who invented plate
>>tectonics, would be Kepler. Plate tectonics
>>doesn't have a "Newton" yet, much less an
>>"Einstein." Non-believers are leaping the
>>progression and looking for that "Einstein."
> I'm not sure I follow this. As far as I knew, plate
> tectonics was a successful theory just because there
> was already at least one reasonable physical
> explanation for the kinematic facts. Yes, Newton
> originally had to work out the whole theory behind
> gravitational forces, but we can take that and other
> physical facts for granted, so we're way beyond
> Newton in geophysics (I think). What would the
> Newton of plate tectonics be doing? Postulating
> new forces to explain plate motions?

There may not ever be an "Einstein" of plate tectonics, as Eric Gross implies. My analogy to astronomy stressed that plate tectonics is still a kinematic theory--it gives you a cohesive description of what is happening but it doesn't tell you why. That's why I compared it to the contributions of Kepler in astronomy--Kepler's laws were kinematic also.

Dr. Harper's and others contributions to geophysics are important but the fact remains that plate tectonics is considered a kinematic theory. Mantle convection is an obvious culprit, but pinning down the mechanism has been elusive. Even Wegener postulated mantle convection of a sort and was hooted down accordingly. One of the reasons that plate tectonics was resisted in the sixties was that geophysicists still considered mantle convection problematic.

The excess bulge at the equator (that which cannot be explained by Newton's laws) was considered a residue of the deformation due to the ice-age ice sheets. In that view, the viscosity of the Earth was too high to support mantle convection. That idea of the excess bulge was refuted in the late sixties by Goldreich and Toomre, and plate tectonics was immediately taken as evidence of a much lower viscosity.

Unfortunately, many studies over the subsequent 30 years have come to the gradual conclusion that the mantle viscosity is much higher than that required by plate tectonics. So what's up? That's the question that will be answered by plate tectonics "Newton".

Even all the impressive graphic representations of mantle convection that appear in Science and Nature make explicit their assumption, in their calculations, of a Rayleigh number consistent with plate tectonics--which is almost certainly not correct.

That is the basis for the current arguments among geophysicists about whether mantle convection is deep (from the core to the surface) or shallow (about 700km deep). Many people think that geophysics has already experienced its paradigm shift (plate tectonics) and nothing exciting will be soon forthcoming. I would disagree.
mentock@mindspring.com
http://www.mindspring.com/~mentock/index.htm
Organization: MindSpring Enterprises, Inc.
So we should expect something exciting yet to come from plate tectonics!!

Charles

The AEES subscription year is from 1 Dec to 30 November. It is difficult and expensive to send each of ~400 members an individual reminder that fees are due so please help us by sending your subscription for 1996/97 to AEES (attn: John Wilson, Civil and Environmental Engineering Dept, Melbourne University Parkville Vic 3052) or renew through IEAust's annual subscription system by marking AEES your preferred Society. If you change address or if you know a member who is not receiving the newsletter please advise the Secretary, many newsletters are returned.

1996 AEES Conference Proceedings

This handsomely illustrated volume is now available and at a very reasonable price. To both learn about earthquake engineering issues and support the Society place your orders now.

Adelaide was chosen as the venue partly because 1997 was the 100th anniversary of the Kingston/Beachport earthquake in the southeast of South Australia. The Report's cover illustrations were from contemporary photographs discovered by Gaye Downes from IGNS New Zealand whilst cleaning up George Eiby's office which she had inherited. We do not know how they got to New Zealand but a certain geologist with a keen interest in earthquakes Professor Howchin returned to New Zealand from South Australia in the early 1900s and..... Luckily for us Gaye recognised the locality and asked AGSO if we were interested in a copy which David Love obtained and Barbara Butler cleverly used for the cover. Many thanks Gaye!

RECENT AUSTRALIAN EARTHQUAKES

After the recent spate of interesting earthquakes in NSW, Victoria and South Australia described in the last 3 newsletters, activity had quietened down to normal levels.

Below is a list from AGSO's Earthquake Database compiled by AGSO and State agencies SRC, TasUni, MESA, UQ, CQU of the earthquakes that have occurred in Australia in the first 6 months of 1997. Many of the earthquakes near populated centres were reported felt but there appears to have been no damage. The largest was the magnitude ML 5.0 earthquake near Clare SA.

1997 Earthquakes in Australia

DD	UTC	Lat	Long	ML	Place
January					
02	71111	28.45	148.85	3.1	St George Qld
19	190643	24.47	155.85	3.5	Gladstone Qld
20	110321	38.46	144.89	3.5	Mornington Peninsula Vic
21	205732	35.70	148.67	2.9	Snowy Mtn NSW
23	234555	19.91	133.99	3.5	Tennant Ck NT
February					
05	1514	28.80	139.12	4.3	Etadunna SA
05	145557	29.85	123.27	3.3	Zanthus WA
06	135617	30.13	123.92	3.3	Zanthus WA
15	132850	20.53	146.36	3.5	Charters Towers Qld
20	144543	15.95	120.86	3.5	Broome WA
22	84840	21.76	126.33	3.8	Tobin L WA
March					
03	30547	16.59	127.00	3.3	Kimberley WA
03	195345	27.31	134.69	3.4	Oodnadatta SA
05	61521	33.82	138.97	5.0	Clare SA
05	75345	33.82	139.07	3.1	Clare SA
14	235801	10.85	130.55	3.1	Melville Is NT
15	150736	33.81	139.01	3.5	Clare SA
18	232528	19.01	119.59	3.3	Pt Hedland WA
27	35235	31.47	117.68	3.2	Kellerberrin WA
27	61418	31.48	117.67	3.3	Kellerberrin WA
27	75805	31.46	117.69	2.9	Kellerberrin WA
27	165819	31.48	117.68	3.0	Kellerberrin WA
29	205727	30.71	143.63	2.9	Whitecliffs NSW
April					
01	81156	19.82	134.00	3.1	Tennant Ck NT
03	155635	31.17	138.47	3.4	Parachilna SA
12	201642	33.81	139.10	3.3	Clare SA
21	133744	22.73	113.89	3.1	Ningaloo WA
24	201218	31.46	117.67	3.2	Kellerberrin WA
24	230640	31.46	117.68	2.9	Kellerberrin WA
My					
03	225417	33.7	138.6	3.3	Clare SA
04	223318	38.1	145.9	3.0	Warragul Vic
09	063116	44.3	118.0	4.3	Albany WA
13	210709	44.5	118.2	3.2	Albany WA
17	162445	30.1	143.4	3.1	Tibooburra SA
18	083552	23.7	112.9	3.0	C Cuvier WA
28	175545	23.9	153.3	3.5	Bundaberg Qld
June					
23	204421	23.11	131.87	4.2	Papunya NT
2	32027	36.75	145.95	3.8	Benalla Vic

WCEE 2000
AUCKLAND NEW ZEALAND

The New Zealand National Society for Earthquake Engineering will host the next World Conference on Earthquake Engineering in Auckland in the year 2000.

Conference Proceedings

AEES The main function of our Society is the Annual Seminar. You can keep informed about the latest developments in Earthquake Engineering and Engineering Seismology in Australia by purchasing the Proceedings of these seminars.

1992, 1993 and 1994 Proceedings $25 each, $45 for two, $60 all three.
1996 Proceedings now available $30

Postage within Australia add $5 for each volume.
Sales:
Barbara Butler Fax: 61 3 9348 1524.

PCEE

•1995 Melbourne Proceedings $185 (3 volumes) from Mrs Barbara Butler, Melbourne Uni
phone 03 9344 6712 / fax 03 9348 1524
•1987 & 1991 Proceedings NZ$50 plus P&P from Admin Sec Michael Brice, NZNSEE, PO Box 312 Waikanae New Zealand

CURRENT RESEARCH: EARTHQUAKE ENGINEERING and ENGINEERING SEISMOLOGY IN AUSTRALIA

This is the second Newsletter article to let you know what is happening in relevant Research Institutions around Australia, the first being Adelaide University. Do note John's kind invitation at the end of this article for you to attend the planning meetings.

"EARTHQUAKE ENGINEERING RESEARCH AT THE UNIVERSITY OF MELBOURNE"

The Earthquake Engineering Research Group (EERG) at The University of Melbourne, Civil and Environmental Engineering Department have a number of research projects currently in progress. The EERG meets on a weekly basis on Mondays 1:00pm to 2:30pm to discuss, review and critique current projects. Approximately 10 postgraduate students together with academic staff members including Prof. Graham Hutchinson, John Wilson, Dr Helen Goldsworthy and Dr Priyan Mendis and Research Fellows Dr Nelson Lam and Emad Gad form the EERG.

Current projects include:

1. Investigation of typical earthquake ground motions and ductility factors for Australian conditions. This project has received ARC funding for six years from 1994 - 1999 and has examined source modelling, soil effects and the response of typical structures to earthquake ground excitation typical of Australia's conditions. The 'displacement based' method of design is also being investigated.

2. Earthquake response of wide band beam moment resisting frame structures. This project has ARC funding for 3 years 1996 - 1998, and involves both analytical and experimental studies. In particular the cyclic behaviour of a wide band beam/column joint is being investigated experimentally.

3. The earthquake response of light gauge steel framing including system effects. This project has received ARC and industry support for 5 years from 1992 - 1996. Fundamental research into the interaction of light gauge steel frames with plasterboard, (including the effects of cornices) and brick veneer has been studied analytically and experimentally using the Department's shaking table facility. Results are currently being translated into practical design guidelines for industry.

4. The performance of load bearing precast concrete structures to earthquake excitation. This project is sponsored by the SRIA under the APA (Industry) scheme (1995 - 1998) and is investigating the behaviour of precast floor slab/wall panel connections under cyclic loading, both experimentally and analytically.

5. The response of reinforced concrete chimneys to earthquake excitation. This research is sponsored by the CICIND group, and is primarily investigating the ductility capabilities of large diameter/thickness reinforced concrete pipes under cyclic loading. Experimental studies using pseudo static cyclic testing methods are being undertaken together with analytical studies. The experimental program commenced in 1996 and results from the pilot tests have been presented to the CICIND group in April 1997.

6. The response of unreinforced masonry (URM) wall panels to inplane and out of plane excitation. This is a joint project between the Universities of Adelaide (Dr Mike Griffiths) and Melbourne and involves shaking table experimental tests together with analytical studies. The project has ARC funding for 3 years, 1997 - 1999 and in particular will investigate the appropriateness of current code methods and the equal energy method for predicting the stability of URM walls with a variety of boundary conditions. This research will complement the previous studies undertaken investigating the rocking behaviour of URM parapet walls.

7. The cyclic performance of connections in concentrically braced steel frames (CBF). This project is funded by an ARC small grant (1996 - 1997) and involves both physical testing and analytical studies of typical CBF steel joints designed in areas of low to moderate seismicity. Possible simple and cheap retrofitting measures will also be investigated.

8. The cyclic moment curvature behaviour of reinforced concrete column splices. This project (1997 - 1998) will involve both experimental and analytical studies of typical column splices designed to AS3600.

Any member of AEES who is visiting the University is welcome to join in the EERG meetings. For further information on any of the projects please do not hesitate to contact members of the EERG.

John Wilson (Hon Treasurer AEES)

The Recent Earthquake in IRAN

Newspaper extracts of the M 7.2 earthquake on 10 May 1997 in Iran tell an all too familiar story of death and destruction following an unexpected earthquake. It was to prevent just such a disaster that the UN declared this the International Decade for Natural Disaster Reduction (IDNDR). Two programs instigated under the IDNDR were WSSI by the IAEE and GSHAP by IASPEI.

Under the Global Seismic Hazard Assessment Program a software package has been made available

to regional centres to undertake earthquake hazard analyses using accepted methods, attenuation relationships and taking formal account of uncertainties in the various parameters.

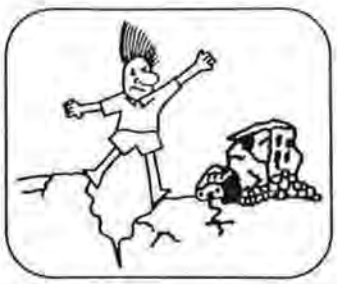
Dr David Denham from AGSO and a founding member of AEES was appointed regional coordinator for the Australia region which included SW Pacific countries from New Zealand to Papua New Guinea.

Iran has suffered similar and worse disasters this century (in 1990, 50 000 people are reported to have died in the Rasht-Qazvin-Zanjan area of Western Iran - the earthquake had a magnitude of Ms 7.4) and it is obvious that Iranian authorities, politicians and engineers have not yet implemented the lessons learned from these past disasters; they have not instigated a nationwide program to strengthen existing buildings or change building materials and modify construction techniques.

It is worth contemplating this lesson as you look at the building stock in our large cities next time you happen to be walking around downtown and try to imagine their response in a similar earthquake - with the experience of Newcastle behind you.

It couldn't happen here you say! Not such a large earthquake! The reality is that earthquakes of this size have occurred in Australia or just offshore this century (in 1906 off central WA see the AGSO webpage at http://www.agso.gov.au and click on Geohazards then under Services *submit* earthquakes).

So it is not that major earthquakes can not happen nor have not happened in Australia - they are less frequent in Australia than in places like Iran, New Zealand or California, and written our history is very short.



FORTHCOMING CONFERENCES

(Flyers for some conferences are available from Ed)

• **1997, 20-24 July; Istanbul, Turkey 8th International Conference On Soil Dynamics And Earthquake Engineering (SDEE '97)**
details last Newsletter)
contact: Prof Papazachos iaspei@olymp.ccf.auth.gr

• **1997, 2-3 October, AEES Annual Seminar and AGM**, University of Queensland, Brisbane (see flyer enclosed with last Newsletter).

• **1998, 27 - 30 April Santiago CHILE.** International Conference on 'Modern Preparation and Response Systems for Earthquake, Tsunami and Volcanic Hazards' IUGG Chile National Committee email: seisvolc@conf.dgf.uchile.cl

• **1998, 6-11 September; Paris La Défense France, 11th European Conference on Earthquake Engineering.** Organised by EAEE, information at http://dfc2.enpc.fr/ecee11 (flyer available - Ed)

• **2000 - WCEE/PCEE Auckland New Zealand** - Watch this space.

NEW BOOKS / REPORTS

Acceptable Risks for Major Infrastructure. Eds P Heinrichs and R Fell, Balkema 1995. Proceedings of the Seminar on Acceptable Risks for Extreme Events in the Planning and Design of Major Infrastructure. Sydney NSW Australia, 26 - 27 April 1994.

Report on the January 17, 1995 Great Hyogo-Ken Nambu (Kobe) Earthquake. Lam Pham & M Griffith. CSIRO DBCE 95/175(M).

The Catastrophe of Mt Gambier's Earthquake. Published and written by Ronald L Thomson, Mt Gambier 1996. 44pp.

Earthquake Engineering *Proceedings of the 10th European Conference*, Vienna Austria 28 Aug - 2 September 1994, Balkema, Ed G Duma, price $593.00

Tsunami - Progress in Prediction, Disaster Prevention and Warning in *Advances in Natural and Technological Hazards* Eds Yoshito Tsuchiya & Nobuo Shuto. Kluwer Academic price $240

Isoseismal Atlas of Australian Earthquakes - Part 3 AGSO Record 1995/44, $50 + pp. AGSO Sales Centre phone: 06 249 9519, fax: 06 249 9982

Australian Seismological Report - 1994 AGSO Sales Centre ph: 06 249 99519, fax: 06 249 9982

Fundamentals of Earthquake Prediction by Cinna Lomnitz: John Wiley & Sons.

The Geology of Earthquakes by R.S. Yeats, K.E. Sieh, and C.R. Allen: Oxford University Press, 576 p., price $65.00.

Paleoseismology, edited by James P. McCalpin. Academic Press, 576 p., price $89.95.

Note 1 The eastern half of the earthquake hazard map of the US on p3 bears a striking resemblance to the current Australian earthquake hazard map, with highs around past earthquakes and lows everywhere else, and as Charles pointed out on p 1, no zone zero. That is there is nowhere where the risk is considered low enough that it can be neglected for normal building construction.

Note 2 Page 8 is reprinted (with permission) from AEMI's latest publication INFOrecent. They have an extensive library which you might like to use.

AUSTRALIAN EMERGENCY MANAGEMENT INSTITUTE

INFORMATION CENTRE

The Australian Emergency Management Institute is situated approximately 60 kms north-west of Melbourne at Mt Macedon. It was formerly known as the Australian Counter Disaster College and is the education and research branch of Emergency Management Australia. The Institute conducts a range of activities intended to improve the nation's capability in Disaster Management.

Activities conducted by the Institute include short courses of study delivered on or off campus, seminars and workshops. Another function is to provide consultancies into selected aspects of counter disaster management.

In support of the Institute's activities the Centre has developed an extensive collection of Disaster Management material. Although the collection is orientated toward the Institute's teaching curriculum, the collection endeavours to encompass a multi-agency and multi-disciplinary perspective which includes engineering, medicine, sociology, psychology, police, ambulance and organisational management.

The collection is comprised of approximately 8000 books, reports, journals, videos, films and other materials. With the information explosion in this field it has become necessary to ensure that the Institutes's courses reflect the current trends and issues of disaster management. Consequently, the Centre endeavours to access as much of this information as possible so the Institute instructors are aware of its existence and can incorporate it into course content.

Frequently the Centre is used as a resource in support of the Institute's courses – whether it be by providing material for syndicate work or the inclusion of individual or group research on various topics of Disaster Management. This introduces students to the wide range of literature associated with Disaster Management and assists them in developing information access skills in order to keep abreast of issues and trends relevant to their field of interest after they leave the Institute.

Furthermore, the Centre subscribes to some 150 journals and has access to a range of national and international on-line databases. The Centre hosts a computer bulletin board system known as ADMIN (Australian Disaster Management Information Network) which facilitates electronic mail interchange of information for the national and international Disaster Community.

The Centre provides a loan service to libraries or direct to individuals if they do not have access to a library. Videos are in constant demand and are available on loan for three weeks. So as to enable clients to know what material the Centre holds, a quarterly Library Bulletin called INFOrecent is produced and is freely available on Internet, and can be accessed from the AEMI home page at:

http://www.ema.gov.au/aemi/index.html

The book/report catalogue and journal index database are also available to be searched via ADMIN. The Centre attempts to provide an information service where clients can write, fax or phone requests and the Centre will respond to these requests as time and resources permit. In addition, the Centre also publishes a journal titled The Australian Journal of Emergency Management. It is free, published quarterly and provides information on a wide range of topics in the field of Disaster Management. Free subscription to the Journal and INFOrecent can be arranged by writing or faxing a request to the Centre.

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