



Australian Geomechanics Society

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*The Australian Geomechanics Society is jointly sponsored by:
The Institution of Engineers, Australia
The Australasian Institute of Mining and Metallurgy*

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28 November 2005

Dr. Luís Lamas
Secretary General
ISRM Secretariat
LNEC
Av. do Brasil, 101
1700-066 LISBOA
PORTUGAL

Dear Dr. Lamas

2007 MÜLLER AWARD NOMINATION EMERITUS PROFESSOR E. T. (TED) BROWN AC

The Australian Geomechanics Society has great pleasure in nominating Emeritus Prof. E. T. Brown for the 2007 Müller Award. A summary curriculum vitae is appended, which provides Prof. Brown's personal details, academic and professional qualifications, honours and awards, career details, research, service to the ISRM and rock mechanics generally and lists his professional publications.

Prof. Brown is an acknowledged expert of world standing in the rock mechanics field, having spent his professional life lecturing, mentoring and practicing in the discipline. His education achievements include a Doctor of Philosophy from The University of Queensland in 1969 and a Doctor of Science (Engineering) from the University of London in 1985. His academic career spanned 36 years from 1965 to 2001. Initially at James Cook University as a lecturer and Associate Professor, Ted was Reader and then Professor of Rock Mechanics at Imperial College of Science and Technology in London from 1975 to 1987, and Dean of the Royal School of Mines from 1983 to 1986. On returning to Australia, Ted became Dean of Engineering at The University of Queensland from 1987 to 1990, and was Deputy Vice Chancellor and later Senior Deputy Vice Chancellor.

During his academic career he wrote, co-authored or edited many books on rock mechanics, and published over 120 technical papers on the subject, as summarised in the attachment. Several of his texts are regarded as essential references amongst practitioners. In 2004, Ted along with co-author Prof B. H. G. Brady, did a substantial update for the 3rd Edition of “Rock Mechanics for Underground Mining”. Currently he is preparing the 2nd Edition of his book “Block Caving Geomechanics”. Ted also contributed greatly to the furthering of knowledge in both the industry and academic circles by sitting on numerous organising committees and editorial boards for a wide range of conferences, symposia, and journals.

Over recent years Ted has given keynote addresses at the following conferences: Water in Mining 2003 (“Water for a Sustainable Minerals Industry – a Review”); Massmin 2004 (“Geomechanics: the Critical Discipline for Mass Mining”); 9th Australian New Zealand Conference on Geomechanics 2004 (“The Mechanics of Discontinua: Engineering in Discontinuous Rock”) and Fifth International Symposium in Ground Support in Mining and Underground Construction 2004 (“The Dynamic Environment of Ground Support and Reinforcement”).

Since leaving academia in 2001, Ted has continued his contributions to the industry, working as a retained consultant in the rock mechanics field along with research through the Sustainable Minerals Institute and Julius Kruttschnitt Mineral Research Centre at The University of Queensland.

An acknowledgement of Professor Brown’s lifelong contribution to geotechnical engineering came with his appointment as a Companion in the General Division of the Order of Australia (AC) in 2001 “for service to the engineering profession as a world expert in the field of rock mechanics.” This award is the highest honour that can be bestowed on an Australian citizen.

Prof Brown is very highly regarded within Australia and internationally. He has been and continues to be a committed teacher, author and mentor and his personal intellect, attributes and drive have contributed substantially to the field of rock mechanics and the ISRM over an extended period of time, including having attended all 11 ISRM Congresses and being the President of the Society from 1983 to 1987.

We consider that he is an ideal candidate for consideration for the 2007 Müller award.



Dr. Mark Jaksa
Chair, Australian Geomechanics Society



27 November 2005

Dr M B Jaksa
Chairman, Australian Geomechanics Society
Dept of Civil & Environmental Engineering
The University of Adelaide
ADELAIDE SA 5005

Dear Dr Jaksa:

Nomination of Professor E T Brown for the 5th Müller Award

This letter is to support Professor Ted Brown's nomination for the 5th Müller Award. Having worked with or been otherwise associated with Professor Brown and his activities over the last 30+ years, I believe I can make well-informed comments on his exceptional personal and professional contributions to rock mechanics and rock engineering.

The extent of Professor Brown's contributions to development of the science and engineering practice of rock mechanics can be gauged by the enormous number of his publications of papers, books and keynote and other presentations. In an administrative and leadership capacity, he has served the Australian, British and international rock mechanics communities with dedication and distinction through his leadership of working parties on ISRM standard methods, national groups and the ISRM itself. He was responsible for leadership in formalisation of many rock characterisation practices which have become part of the standard practice of rock mechanics and rock engineering. His period of Presidency of the ISRM was marked by sound planning and steady management of the Society's business.

Professor Brown is widely recognised as an authoritative figure with acute insights into the fundamental principles and engineering applications of the discipline. Books of which he is either author or co-author have become established as part of the educational instruction set and professional reference collection in rock engineering. A particularly noteworthy and recent contribution is the book 'Block Caving Mechanics', which has had tremendous impact on the practice of large-scale underground mining engineering.

As a former Chairman of the US national rock mechanics group and a US delegate to ISRM meetings, I was involved in the successful nominations of several earlier recipients of Müller Awards. In my view, Professor Brown is a worthy member of the small group of distinguished engineers and scientists who have been recognised through award of the ISRM's highest distinction.

Yours sincerely,

B H Brady
Emeritus Professor

SUMMARY CURRICULUM VITAE

Emeritus Professor E T (Ted) Brown AC

BE, MEngSc, PhD, DSc (Eng), FREng, FTSE, FIEAust, FIMMM, MICE, MASCE, MAICD

1. PERSONAL DETAILS

Name: Edwin Thomas BROWN

Date and Place of Birth: 4 December 1938 at Castlemaine, Victoria, Australia

Address: 5121 Bridgewater Crest
55 Baidon Street
Kangaroo Point
QLD 4169
AUSTRALIA

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tbrown@golder.com.au

2. ACADEMIC AND PROFESSIONAL QUALIFICATIONS

(a) Degrees

Bachelor of Engineering (Hons), University of Melbourne, 1960
Master of Engineering Science (Hons), University of Melbourne, 1964
Doctor of Philosophy, University of Queensland, 1969
Doctor of Science (Engineering), University of London, 1985

(b) Professional and Learned Society Memberships

Fellow, Institute of Materials, Minerals and Mining (formerly The Institution of Mining and Metallurgy)
Fellow, Institution of Engineers, Australia
Member, Institution of Civil Engineers
Life Member, American Society of Civil Engineers
Member, International Society for Rock Mechanics
Member, International Society for Soil Mechanics and Geotechnical Engineering
Member, Australian Geomechanics Society
Member, Australian Underground Construction and Tunnelling Association
Member, Australian Institute of Company Directors

(c) Learned Academy Fellowships

Foreign Fellow, Royal Academy of Engineering (formerly The Fellowship of Engineering), UK, 1989
Fellow, Australian Academy of Technological Sciences and Engineering, 1990

3. HONOURS AND AWARDS

Consolidated Gold Fields plc Gold Medallist, The Institution of Mining & Metallurgy, 1984
Nineteenth Sir Julius Wernher Memorial Lecturer, The Institution of Mining & Metallurgy, 1985
Fellow of the Queensland Institute of Medical Research, 1995

Appointed a Companion in the General Division of the Order of Australia (AC), (the highest level in the national honours system), 2001, "for service to the engineering profession as a world expert in rock mechanics and to scholarship through promotion of the highest academic and professional standards"

Awarded a Centenary Medal by the Commonwealth of Australia, 2002, "for service to Australian society in mining and civil engineering"

John Jaeger Memorial Award, Australian Geomechanics Society, 2004.

4. CAREER SUMMARY

1960 – 1964:	Engineer, Coal Production Branch, State Electricity Commission of Victoria
1964 – 1975:	PhD student (1964-65), Lecturer (1965-68), Senior Lecturer (1969-72) and Associate Professor (1973-75), Department of Engineering, University College of Townsville and, from 1970, James Cook University of North Queensland
1975 – 1987:	Reader (1975-79) and Professor (1979-87) of Rock Mechanics, Department of Mineral Resources Engineering, Imperial College of Science and Technology, University of London Dean, Royal School of Mines, Imperial College (1983-86) Head, Department of Mineral Resources Engineering, Imperial College (1985-87)
1987 – 1990:	Professor and Dean of Engineering, The University of Queensland
1990 – 2001:	Deputy Vice-Chancellor and, from 1996, Senior Deputy Vice-Chancellor, The University of Queensland
2001 – date:	Senior Consultant, Golder Associates Pty Ltd, Consulting Engineers, Research Consultant, Sustainable Minerals Institute and Julius Kruttschnitt Mineral Research Centre, University of Queensland, and company director.

5. RESEARCH

Initiated, carried out, and supervised, research on a wide variety of rock mechanics, rock engineering and other geotechnical engineering topics over a period of 40 years. The major personal research efforts have been in the areas of:

- the mechanics of brown coal;
- rock material deformation, fracture and failure, including the effect of elevated temperatures;
- rock drilling for geotechnical characterisation, and in mining and energy resource exploitation;
- rock mass strength, including working with Dr Evert Hoek in the development, adaptation and application of the widely used Hoek-Brown empirical strength criterion;
- the mechanical and hydromechanical properties of rock joints;
- the analysis, design, support and reinforcement of underground excavations in rock; and
- several aspects of underground mining geomechanics, particularly block caving geomechanics.

Reviewed the rock mechanics and rock engineering research programs of a number of academic, Government and private sector organisations (e.g. Australian Coal Association Research Program; BHP Australia Coal Special Research Program; Chamber of Mines and CSIR, South Africa; Minerals Council of Australia;) (see long cv, page 18)

Reviewer or assessor for research grant and fellowship applications for a wide range of grant awarding bodies in Australia, Europe, UK and USA (see long cv, pages 18-19)

Served on a large number of Boards and committees concerned with research in rock mechanics and related areas (see long cv, pages 16-18)

Author or co-author of three major books; editor or co-editor of five edited volumes; author or co-author of 125 papers or book chapters, and of 11 published discussions (see List of Publications).

6. CONSULTING ENGINEERING

Almost 40 years national and international consulting experience on:

- ◆ rock engineering aspects of civil engineering projects including foundations, slopes, tunnels and large caverns;
- ◆ surface and underground coal and metalliferous mines; and
- ◆ energy projects including coal, geothermal energy, hydroelectric power and underground gas storage

Retained Consultant to Golder Associates Pty Ltd, Consulting Engineers, from 1988 to 2000. Currently a part-time Senior Consultant to that company

Wide experience as an expert witness, a peer reviewer and member of technical review boards and committees.

7. SERVICE TO ISRM AND NATIONAL GROUPS

Attended and submitted papers to all 11 ISRM Congresses held to date (one of a very few to have done so)

Various Australian and UK representative on Council, 1971-85

Member, Commission on Teaching, 1973-83

Session Chair or keynote speaker at International Congresses and Symposia of the ISRM and the International Association of Engineering Geologists, 1974, 1976, 1977, 1978, 1979, 1983, 1984, 1986, 1988, 1989, 1991, 1994, 2003

Member, Commission on Research, 1975-79

Member, Commission on Testing Methods, 1979-83

President, Commission on Boreability, Cuttability and Drillability, 1980-83

Member, British Geotechnical Society Committee, 1979-83; Vice-Chairman 1981

Chairman, British Geotechnical Society (ISRM NG UK), 1982 and 1983

President of the Society, 1983-87

Chair, Organizing Committee, International Symposium on Design and Performance of Underground Excavations (ISRM Symposium), Cambridge, 1984

Member of Council as a Past-President since 1988.

8. OTHER SERVICE TO THE PROFESSION OF ROCK MECHANICS

Author, co-author or editor of several well-known books including *Underground Excavations in Rock* (with E Hoek), *Rock Mechanics for Underground Mining* (with B H G Brady, now in its Third Edition) and *Rock Characterisation, Testing and Monitoring: ISRM Suggested Methods* (editor) (see List of Publications)

Supervised 19 PhD students to completion and mentored several to positions of leadership in rock mechanics

Editor-in-Chief, *International Journal of Rock Mechanics and Mining Sciences*, 1975-82. Editorial advisor and Editorial Board member, 1982-date

Head of the Rock Mechanics Section, Royal School of Mines, Imperial College, London, 1975-1987, when that group was a world leader in rock mechanics teaching and research

Represented the profession of rock mechanics at a high level in the broader field of geotechnical engineering and in engineering more generally (see section 9 below)

As a rock mechanics professor, represented the discipline at higher levels in universities as a Head of Department and Dean at Imperial College, London, and over a 13 year period as Dean of Engineering, Deputy Vice-Chancellor and Senior Deputy Vice Chancellor at The University of Queensland

Served on or chaired several high level committees and Boards (other than within the ISRM) associated with rock mechanics and its applications. For example: Chair, Scientific Review Committee, Camborne School of Mines Hot Dry Rock Geothermal Energy Project 1981-84; Foundation Chair, Cooperative Research Centre for Mining Technology and Equipment (CMTE) 1991-93; Member, International Geomechanical Commission (to report on the long-term effects of the underground nuclear tests at Mururoa and Fangataufa atolls) 1996-99; Chair, Board of Management, Julius Kruttschnitt Mineral Research Centre, 1997-2000.

9. OTHER MAJOR PROFESSIONAL AND LEARNED SOCIETY ACTIVITIES

Member, Editorial Advisory Panel, *Géotechnique* (The Institution of Civil Engineers), 1975-79, 2003-2004

Member, Editorial Board, *Quarterly Journal of Engineering Geology*, (Geological Society of London), 1976-81

General Technical Reporter, Tunnelling '76, Tunnelling '79 and Tunnelling '82, The Institution of Mining and Metallurgy, London, 1976, 1979, 1982

Member, Editorial Advisory Board, *International Journal of Numerical and Analytical Methods in Geomechanics*, 1979-2000

Member, Organising Committee, International Tunnelling Symposium - Tunnelling '82, The Institution of Mining & Metallurgy, 1982

Member, Ground Engineering Board, The Institution of Civil Engineers, 1982-83

Member, Queensland Division Committee, Institution of Engineers, Australia, 1989-91; Vice-Chairman, Queensland Division, 1990

Member, Accreditation Board, Institution of Engineers, Australia, 1990-93

Chair, Queensland Division, Australian Academy of Technological Sciences and Engineering, 1997 and 1998

Member of Council, Australian Academy of Technological Sciences and Engineering, 1997, 1998, 2002

Member, Membership Committee, Australian Academy of Technological Sciences and Engineering, 2000; Chair, 2001 – 2002.

10. DIRECTORSHIPS AND OTHER RECENT MAJOR COMMITTEE APPOINTMENTS

Director, Comquest Pty Ltd, 1991-2001

Director, Comquest No 1 and Comquest No 2 Pty Ltd, 1992-2001

Director, Landmarc Limited, 1992-96

Board Member, Distributed Systems Technology Centre Ltd, 1992-93

Member of Council, National Trust of Queensland, 1993-2000

Director, CDE Pty Limited, 1994-96

Director, UQ Holdings Pty Ltd, 1994-2003

Member, national Cooperative Research Centres Committee, 1996-99

Chair, Board, Julius Kruttschnitt Mineral Research Centre, 1997-2000

Chair, Board of Directors, Spin Systems (Qld) Pty Ltd, 1997-2004

Member, Queensland Gas Appeals Tribunal, 1999-2003

Member, Queensland Food and Fibre Science and Innovation Council, 2000-2003

Member, Queensland Rhodes Scholarship Selection Committee, 2000-2004 (Deputy Chair 2003-04)

Chair, Board of Directors, IMBcom Pty Ltd, 2000-2003

Chair, Board of Directors, JKTech Pty Ltd. 2001-2003

Director, Queensland Rail (a Government Owned Corporation), 2001-2005

Chair, Board of Directors, Interail Australia Pty Ltd (a QR subsidiary), 2002-2005

Member, South East Queensland Regional Electricity Council, 2004-date

Director, Port of Brisbane Corporation, 2005-date.

October 2005

LIST OF PUBLICATIONS

Emeritus Professor E T Brown AC FREng FTSE

October 2005

BOOKS

1. Hoek, E and Brown, E T. *Underground Excavations in Rock*, 1980, 527 pp. Institution of Mining and Metallurgy: London.
2. Brady, B H G and Brown, E T. *Rock Mechanics for Underground Mining*, 1985, 527 pp. George Allen & Unwin: London, (2nd edition, 1993, 571 pp, Chapman & Hall: London; 3rd edition, 2004, 628 pp, Kluwer Academic Publishers: Dordrecht).
3. Brown, E T. *Block Caving Geomechanics*, 2003, 516 pp. JKMRRC: Brisbane.

EDITED VOLUMES

4. Jenkins, J P and Brown, E T. (eds) *KWIC Index of Rock Mechanics Literature Part 2 (1969-1976)*, 1976, 731 pp. Pergamon Press: Oxford.
5. Brown, E T (ed). *Rock Characterization, Testing and Monitoring - ISRM Suggested Methods*, 1981, 211 pp. Pergamon Press: Oxford.
6. Brown, E T and Hudson, J A (eds). *Design and Performance of Underground Excavations - ISRM Symposium*. 1984, 518 pp. British Geotechnical Society: London.
7. Brown, E T (ed). *Analytical and Computational Methods in Engineering Rock Mechanics*, 1987, 259 pp. George Allen & Unwin: London.
8. Brown, E T (ed). *Comprehensive Rock Engineering. Volume 1 – Fundamentals*, 1993, 752 pp. Pergamon Press: Oxford.

PAPERS IN CONFERENCE PROCEEDINGS AND JOURNALS AND CHAPTERS IN BOOKS

9. Trollope, D H and Brown, E T. Pressure distributions in some discontinua. *Water Power*, Vol 17, No 8, 1965, pp 310-313.
10. Trollope, D H, Rosengren, K J and Brown, E T. The mechanics of brown coal. *Géotechnique*, Vol 15, No 4, 1965, pp 363-386.
11. Trollope, D H and Brown, E T. Effective stress criteria of failure of rock masses. *Proceedings, First Congress, International Society for Rock Mechanics*, Lisbon, 1966, Vol 1, pp 515-519.
12. Trollope, D H and Brown, E T. An analytical relationship between saturated soil strength and stress history. *Proceedings, 5th Australia-New Zealand Conference on Soil Mechanics and Foundation Engineering*, Auckland, 1967, pp 79-89.
13. Brown, E T and Trollope, D H. The failure of linear brittle materials under effective tensile stress. *Rock Mechanics and Engineering Geology*, Vol 5, No 4, 1967, pp 229-241.
14. Trollope, D H and Brown, E T. The application of fracture mechanics to rock structures. *Proceedings, Symposium on Rock Mechanics*, Institution of Engineers, Australia, Sydney, 1969, pp 65-71.
15. Brown, E T and Trollope, D H. Strength of a model of jointed rock. *Journal of the Soil Mechanics and Foundations Division*, American Society of Civil Engineers, Vol 96, No SM2, 1970, pp 685-704.

16. Brown, E T. Modes of failure in jointed rock masses. *Proceedings, Second Congress, International Society for Rock Mechanics*, Belgrade, 1970, Vol 2, pp 293-298.
17. Brown, E T. Strength of models of rock with intermittent joints. *Journal of the Soil Mechanics and Foundations Division*, American Society of Civil Engineers, Vol 96, No SM6, 1970, pp 1935-1949.
18. Brown, E T. The strength of jointed rock masses. *Queensland Division Technical Papers*, Institution of Engineers, Australia, Vol 12, No 9, 1971, 15 pp.
19. Brown, E T. Brittle fracture of rock at low confining pressure. *Proceedings, First Australia-New Zealand Conference on Geomechanics*, Melbourne, 1971, Vol 1, pp 31-36.
20. Hudson, J A, Brown, E T and Fairhurst, C. Shape of the complete stress-strain curve for rock. *Stability of Rock Slopes, Proceedings, 13th Symposium on Rock Mechanics*, Urbana, E J Cording (ed), 1971, pp 773-795. American Society of Civil Engineers: New York.
21. Brown, E T. Strength-size effects in rock material. *Rock Fracture, Proceedings, International Symposium on Rock Mechanics*, Nancy, France, 1971, Vol 1, Paper 2-11.
22. Brown, E T and Hudson, J A. The influence of micro-structure on rock fracture on the laboratory scale. *Rock Fracture, Proceedings, International Symposium on Rock Mechanics*, Nancy, France, 1971, Vol 1, Paper 2-20.
23. Hudson, J A, Brown, E T and Fairhurst, C. Optimising the control of rock failure in servo-controlled laboratory tests. *Rock Mechanics*, Vol 3, No 4, 1971, pp 217-224.
24. Hudson, J A, Brown, E T and Rummel, F. The controlled failure of rock discs and rings loaded in diametral compression. *International Journal of Rock Mechanics and Mining Sciences*, Vol 9, No 2, 1972, pp 241-248.
25. Brown, E T, Hudson, J A, Hardy, M P and Fairhurst, C. Controlled failure of hollow rock cylinders in uniaxial compression. *Rock Mechanics*, Vol 4, No 1, 1972, pp 1-24.
26. Hudson, J A and Brown, E T. Studying time-depending effects in failed rock. *New Horizons in Rock Mechanics, Proceedings, 14th Symposium on Rock Mechanics*, H R Hardy and R Stefanko (eds), 1972, pp 25-34. American Society of Civil Engineers: New York.
27. Brown, E T. A computer-integrated system for controlling fracture tests on brittle materials. *Proceedings, DECUS- Australia Symposium*, Sydney, 1972, pp 25-29.
28. Brown, E T and Hudson, J A. Progressive collapse of simple block-jointed systems. *Australian Geomechanics Journal*, Vol G2, No 1, 1972, pp 49-54.
29. Hudson, J A, Brown, E T and Hardy, M P. Controlling crack growth in rock. *Dynamic Crack Propagation*, G C Sih (ed), 1973, pp 131-143. Noordhoff International Publishing: Leyden.
30. Brown, E T and Gonano, L P. Improved compression test technique for soft rock. *Journal of the Geotechnical Engineering Division*, American Society of Civil Engineers, Vol 100, No GT2, 1974, pp 196-199.
31. Brown, E T and Hudson, J A. Fatigue failure characteristics of some models of jointed rock. *International Journal of Earthquake Engineering and Structural Dynamics*, Vol 2, No 4, 1974, pp 379-386.

32. Brown, E T. Rock fracture under uniform biaxial stress. *Proceedings, 3rd Congress, International Society for Rock Mechanics*, Denver, 1974, Vol 2A, pp 111-117.
33. Atkinson, J H, Brown, E T and Potts, D M. The collapse of shallow unlined circular tunnels in dense sand. *Tunnels and Tunnelling*, Vol 7, No 3, 1975, pp 81-87.
34. Brown, E T and Gonano, L P. An analysis of size effect behaviour in brittle rock. *Proceedings, 2nd Australia-New Zealand Conference on Geomechanics*, Brisbane, 1975, pp 139-143.
35. Gonano, L P and Brown, E T. Stress gradient phenomena and related size effects in brittle material. *Proceedings, 5th Australasian Conference on the Mechanics of Structures and Materials*, Melbourne, 1975, pp 205-218.
36. Brown, E T. Volume changes in models of jointed rock. *Journal of the Geotechnical Engineering Division*, American Society of Civil Engineers, Vol 102, No GT3, 1976, pp 273-276.
37. Hocking, G, Brown, E T and Watson, J O. Three dimensional elastic analysis of underground openings by the boundary integral equation method. *Proceedings, 3rd Symposium on Engineering Applications of Solid Mechanics*, Toronto, 1976, pp 203-216.
38. Bray, J W and Brown, E T. A short solution for the stability of a rock slope containing a tetrahedral wedge. *International Journal of Rock Mechanics and Mining Sciences*, Vol 13, No 7, 1976, pp 227-229.
39. Brown, E T and Hocking, G. The use of the three-dimensional boundary integral equation method for determining stresses at tunnel intersections. *Design and Construction of Tunnels and Shafts - Proceedings, 2nd Australian Tunnelling Conference*, Melbourne, 1976, pp 55-64.
40. Brown, E T. General Technical summary. *Tunnelling '76*, IMM, London, 1977, pp 441-443.
41. Brown, E T, Richards, L R and Barr, M V. Shear strength characteristics of the Delabole slates. *Proceedings, Conference on Rock Engineering*, Newcastle-upon-Tyne, Vol 1, 1977, pp 33-51. University of Newcastle: Newcastle-upon-Tyne.
42. Atkinson, J H, Brown, E T and Potts, D M. Ground movements near shallow model tunnels in sand. *Large Ground Movements and Structures*, J D Geddes (ed), 1978, pp 372-386. Pentech Press: London.
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44. Brown, E T and Michelis, P N. A critical state yield criterion for strain softening rock. *Proceedings, 19th US Symposium on Rock Mechanics*, Lake Tahoe, 1978, pp 515-519.
45. Brown, E T and Hoek, E. Trends in relationships between measured in-situ stresses and depth. *International Journal of Rock Mechanics and Mining Sciences*, Vol 15, No 4, 1978, pp 211-215.
46. Brown, E T and Barr, M V. Instrumented drilling as an aid to tunnelling site investigations. *Proceedings, 3rd Congress, International Association of Engineering Geology*, Madrid, 1978, Section 4, Vol 1, pp 21-28.
47. Brown, E T. CIRIA instrumented drilling trials - background and progress. *Ground Engineering*, Vol 12, No 1, 1979, pp 45-52.

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49. Brown, E T, Hinds, D V and Harper, T R. Discontinuity measurement using the borehole impression probe - a case study. *Proceedings, 4th Congress, International Society for Rock Mechanics*, Montreux, 1979, Vol 2, pp 57-62.
50. Bamford, W E, Brown, E T and Siribumrungsukha, B. Mechanisms of diamond drilling. *Fracture at Work, Proceedings, 4th Tewksbury Symposium*, Melbourne, 1979, pp 7.1-7.25.
51. Brown, E T and Freguson, G A. Prediction of progressive hangingwall caving at Gath's Mine, Rhodesia. *Transactions, Institution of Mining and Metallurgy*, Vol 88, July, 1979, pp A92-105.
52. Brown, E T. General Technical Summary. *Tunnelling '79*, IMM, London, 1979, pp 399-401.
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54. Brown, E T. Recent advances in the application of rock mechanics to mining excavation design. *Non-Ferrous Metals*, Beijing, China, Vol 32, 1980, No 2, pp 18-24, and No 3, pp 28-30.
55. Bock, H and Brown, E T. Foundation properties of coral reefs - site investigation techniques and preliminary results. *Structural Foundations on Rock, Proceedings, International Conference on Structural Foundations on Rock*, Sydney, P J N Pells (ed), 1980, pp 43-54. A A Balkema: Rotterdam.
56. Hoek, E and Brown, E T. Empirical strength criterion for rock masses. *Journal of the Geotechnical Engineering Division*, American Society of Civil Engineers, Vol 106, No GT9, 1980, pp 1013-1035.
57. Brady, B H G and Brown, E T. Energy changes and stability in underground mining: design applications of boundary element methods. *Transactions, Institution of Mining and Metallurgy*, Vol 90, April, 1981, pp A61-68.
58. Brown, E T, Green, S J and Sinha, K P. The influence of rock anisotropy on hole deviation in rotary drilling - a review. *International Journal of Rock Mechanics and Mining Sciences*, Vol 18, No 5, 1981, pp 387-401.
59. Brown, E T. Putting the New Austrian Tunnelling Method in perspective. *Tunnels and Tunnelling*, Vol 13, No 10, 1981, pp 13-17.
60. Boodt, P I, Maini, T and Brown, E T. Three-dimensional water pressure testing of fractured rock. *Proceedings, First International Mine Water Congress*, Budapest, 1982, Section A, pp 165-183.
61. Watson, J O and Brown, E T. Analysis of plane groundwater flow by the boundary integral equation method. *Proceedings, First International Mine Water Congress*, Budapest, 1982, Section A, pp 295-310.
62. Brown, E T and Bray, J W. Rock-support interaction calculations for pressure shafts and tunnels. *Rock Mechanics: Caverns and Pressure Shafts*, W Wittke (ed), 1982, Vol 2, pp 555-565. A A Balkema: Rotterdam.
63. Brown, E T, Bray, J W, Ladanyi, B and Hoek, E. Ground response curves for rock tunnels. *Journal of Geotechnical Engineering*, American Society of Civil Engineers, Vol 109, No 1, 1983, pp 15-39.

64. Priest, S D and Brown, E T. Probabilistic stability analysis of variable rock slopes. *Transactions, Institution of Mining and Metallurgy*, Vol 92, Jan, 1983, pp A1-12.
65. Brown, E T. Technical summary - Tunnelling '82. *Transactions, Institution of Mining and Metallurgy*, Vol 92, Jan, 1983, pp A58-61.
66. Barr, M V and Brown, E T. A site exploration trial using instrumented horizontal drilling. *Proceedings, 5th Congress, International Society for Rock Mechanics*, Melbourne, 1983, Vol 1, pp A51-57.
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68. Brown, E T. Monitoring in rock engineering. *Proceedings, Symposium on Monitoring for Safety in Geotechnical Engineering*, Johannesburg, 1984, pp 1-9.
69. Brown, E T. Technical summary - Rockbursts: prediction and control. *Transactions, Institution of Mining and Metallurgy*, Vol 93, 1984, pp A90-93.
70. Stewart, I J and Brown, E T. A static relaxation method for the analysis of excavations in discontinuous rock. *Design and Performance of Underground Excavations in Rock*, E T Brown and J A Hudson (eds), 1984, pp 149-155. British Geotechnical Society: London.
71. Brown, E T. Stress-strain behaviour of jointed rock masses. Special issue of *Geotechnik*, Zeitschrift fur Bodenmechanik, Felsmechanik, Grundbau und Ingenieur - geologie der DGEG, 1985, pp 13-20.
72. Brown, E T. From theory to practice in rock engineering - The 19th Sir Julius Wernher Memorial Lecture. *Transactions, Institution of Mining and Metallurgy*, Vol 94, 1985, ppA67-82.
73. Elliott, G M, Brown, E T, Boodt, P I and Hudson, J A. Hydromechanical behaviour of joints in the Carnmenellis granite, SW England. *Proceedings, International Symposium on Fundamentals of Rock Joints*, Bjorkliden, Sweden, 1985, pp 249-258.
74. Elliott, G M and Brown, E T. Yield of a soft, high porosity rock. *Géotechnique*, Vol 35, 1985, pp 413-423.
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