



CARMA - ACMR



CANADIAN ROCK MECHANICS
ASSOCIATION

ASSOCIATION CANADIENNE DE
MÉCANIQUE DES ROCHES

Reply to: Dr. A.T.Jakubick
Sec'y-Treasurer, CARMA
c/o Ontario Hydro
800 Kipling Ave. KR2S2
Toronto, Ontario
CANADA M8Z 5S4

International Society for Rock Mechanics
c/o Laboratorio Nacional de Engenharia Civil
101 Av. Brasil
P-1799 Lisboa Codex
PORTUGAL

March 8, 1990

ATTN: Jose G Charrua Graca
Secretary-General, ISRM

Dear Mr. Graca,

On behalf of the Canadian Rock Mechanics Association (CARMA), I am pleased to nominate Dr. Evert Hoek as the first recipient of the ISRM Muller Award for distinguished contributions to the profession of rock mechanics and rock engineering. The appropriate documents are enclosed. Please note that I have attached to the nomination a copy of the Curriculum Vitae of Dr. Hoek, which includes the list of publications which are referenced in the nomination.

Dr. Hoek's address is:

Dr. Evert Hoek
Department of Civil Engineering
University of Toronto
35 Saint George Street
Toronto, Ontario
CANADA M5S 1A4

Please confirm by FAX to me in Canada at 705-673-6532 that you have received this nomination. I look forward to being informed of the ISRM Council's decision following the meeting in Swaziland.

Yours sincerely,

A handwritten signature in black ink that reads "Dougal McCreath". The signature is written in a cursive style with a horizontal line underlining the name.

Dougal McCreath, Ph.D., P.Eng.

Chairman

Canadian Rock Mechanics Association

cc. Dr. J. Nantel, Chairman, CIM-RMSCC
Dr. A. Jakubick, Sec'y-Treasurer, CARMA

Dr. Evert Hoek

Nomination for ISRM Muller Award

by

Canadian Rock Mechanics Association (CARMA)

It is with great pride that the Canadian Rock Mechanics Association nominates Dr. Evert Hoek as the first recipient of the ISRM Muller Award.

This remarkable man, researcher and consultant, author and teacher, has had an enormous impact on the conduct of applied rock engineering for surface and underground projects in both civil engineering and mining developments around the world. The hallmark of Dr. Hoek's work is the ability to seek, find and communicate elegant and simple solutions to real and complex problems. Nowhere is this more apparent than in the two texts which bear his name and which have become the standard works for engineers faced with practical design problems in rock slopes and underground excavations (Hoek & Bray, 1974, ref.35; Hoek & Brown, 1980, ref.47)

Dr. Hoek's talent for synthesis between the theoretical explanations of the researcher and the actual observations and needs of the practicing engineer is the cornerstone of his many contributions to the field of rock mechanics. Dr. Hoek's career has itself been a reflection of this need for synthesis between the key elements of research, engineering practice and education.

After graduation with an M.Sc. as a mechanical engineer from the University of Capetown in 1958, Dr. Hoek worked for 8 years on research into the problems of rock fracture associated with deep level gold mining in South Africa. His background in strength of materials and stress analysis techniques, combined with his practical, down-to-earth nature and a rare ability for uncluttered thinking, provided the basis for significant advances in our understanding of this emerging field of rock mechanics and the

mechanisms of brittle fracture propagation in rock under compression (ref.1 to 14). This work, conducted as Head of the Rock Mechanics Division of the Council for Scientific and Industrial Research, resulted in the award of a Ph.D. from Capetown in 1965. The remarkable quality of the man and his work was recognized internationally at this time, and at age 32 he was asked to join Imperial College, University of London, to establish a new inter-departmental centre for rock mechanics teaching and research. Dr. Hoek became one of the youngest Professors in the history of Imperial College.

From 1966 to 1975, numerous contributions were made to the field of rock mechanics by the Imperial College group under the stimulating guidance of Dr. Hoek (ref.14 to 39), not the least of which was the education of many young rock mechanics engineers who have since become leaders in the field. The Hoek philosophy of seeking practical solutions to complex problems is well illustrated by two examples from this period, the triaxial cell with which his name is synonymous (ref.16), and the elegant Hoek-Brown failure criterion for the strength of jointed rock masses (ref.54).

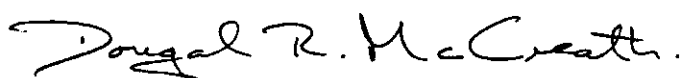
To Evert Hoek, the value of engineering methods is measured by their ability to solve real, practical problems. From 1975 to 1987, as a Senior Principal of Golder Associates, Dr. Hoek applied the principles of rock mechanics to the solution of rock engineering problems on dozens of projects around the world, while continuing his work in the education of numerous practitioners in the field. Meanwhile, as Chairman of the Board, he nurtured the growth of Golder Associates to a staff of over 1000 people and a position of technical eminence in geotechnical engineering, while continuing to contribute substantially to the literature on applied rock engineering (refs. 40 to 63).

In 1987, Dr. Hoek was asked to fill a specially created Chair as Research Professor of Rock Engineering at the University of Toronto, Canada. Here, his research is directed towards development of practical rock mass classification methods for the purpose of selecting engineering properties for use in analyses, development of user-friendly computer programs for practicing engineers, ground support in deep hard rock mines, teaching of a new generation of rock mechanics engineers, and writing of a text which will synthesize the past 35 years of progress and the current state of practice in the field of rock engineering (refs. 64 to 73).

Dr. Hoek's many and distinguished contributions to the field have been recognized by the award of the D.Sc. degree from the University of London in 1975, by the

presentation of international keynote lectures such as the Sir Julius Werhner Memorial Lecture (1982) and the Rankine Lecture (1983) and by such prestigious awards as the Consolidated Goldfields Gold Medal (1970), the AIME Rock Mechanics Award (1975), the E. Burwell Award of the Geological Society of America (1979) and the Gold Medal of the Institution of Mining and Metallurgy (1985). It is fitting that we of the International Society for Rock Mechanics should add our recognition, by bestowing on Dr. Evert Hoek the honour of receiving the first Muller Award.

Respectfully submitted,



Dougal R. McCreath, Ph.D., P.Eng.

Chairman,

Canadian Rock Mechanics Association.

Attachment: Curriculum Vitae of Dr. Evert Hoek

EVERT HOEK

Education

B.Sc., Mechanical Engineering, University of Cape Town, 1955.
M.Sc., Mechanical Engineering, University of Cape Town, 1958.
Ph.D., Engineering (Rock Mechanics), University of Cape Town, 1965.
D.Sc., Engineering (Rock Mechanics), University of London, 1975.

Affiliations

Fellow, Fellowship of Engineering, United Kingdom.
Fellow, Institution of Mining and Metallurgy, United Kingdom.
Member, Canadian Institute of Mining and Metallurgy.
Member, Association of Professional Engineers of Ontario.
Adjunct Professor, Geomechanics Research Centre, Laurentian University, Sudbury, Ontario.
Adjunct Professor, Department of Mining Engineering, Queen's University, Kingston, Ontario.

Positions held

1987 to date - NSERC Industrial Research Professor of Rock Engineering, Department of Civil Engineering, University of Toronto
1983 to 1987 - Senior Principal and Chairman of the Board of Directors, Golder Associates.
1975 to 1983 - Principal and Director, Golder Associates.
1970 to 1975 - Professor of Rock Mechanics at the Royal School of Mines, Imperial College of Science and Technology, University of London, United Kingdom.
1966 to 1970 - Reader in Rock Mechanics at the Royal School of Mines, Imperial College of Science and Technology, Responsible for establishing an interdepartmental centre for teaching and research in rock mechanics.
1958 to 1966 - Research Engineer through to Senior Chief Research Officer and Head of the Rock Mechanics Section, National Mechanical Engineering Research Institute of the South African Council for Scientific and Industrial Research, Pretoria, South Africa.

Awards and lectures

Consolidated Goldfields Gold Medal (1970)
AIME Rock Mechanics Award (1975)
E. Burwell Award from the Geological Society of America (1979)
Association of Professional Engineers of British Columbia Meritorius Achievement Award (1979)
Sir Julius Werhner Memorial Lecturer (1982)
Rankine Lecturer (1983)
The Gold Medal of the Institution of Mining and Metallurgy (1985)

Current Academic Activities

Holder of NSERC Industrial Research Chair in Rock Engineering - funded jointly by NSERC and Placer Dome Inc at \$185,000 per annum to support the Chair, one Research Engineer and operating funds for research on the development of a rock mass classification system for predicting rock mass properties.

Coordinating Principal Investigator for three year research project on the *development of methods for the design of support in underground hard rock mines in Ontario*. This project involves joint research by the Department of Civil Engineering at the University of Toronto, the Geomechanics Research Centre of Laurentian University and the Department of Mining Engineering at the Queen's University. The funding for the project amounts to \$600,000 per annum and is provided by the mining industry in Ontario through the Mining Research Directorate.

Designated Principal Investigator in a proposal submitted to the International Research and Development Corporation for a joint research project between the Mining Research Institute of the University of Zimbabwe and the Department of Civil Engineering of the University of Toronto on *support design for small mines in Zimbabwe*. Funding for \$69,000 per annum for a 3 year project is currently under consideration.

Responsible to teaching two graduate courses on *Engineering Geology related to Rock Mechanics* and *Rock Engineering* in the Department of Civil Engineering at the University of Toronto. Currently supervising 4 PhD and 7 MAsC students.

Current Consulting Activities

Member of a 4 man peer review panel responsible for reviewing the research program proposed for the next ten years for the Underground Research Laboratory operated by Atomic Energy of Canada Limited at Pinawa in Manitoba.

Member of two man review board to advise the British Columbia Hydro and Power Authority on the failure of a pressure tunnel in a hydroelectric project in British Columbia.

Advisory consultant to Sinotech Engineering Consultants Inc in Taiwan on the 1600 MW Mingtan Underground Pumped Storage Project (currently under construction), the New Tienlun Hydroelectric Project (currently being designed) and a 12.8 km tunnel for the Nanking-Ilan Expressway Project (currently in the preliminary design stage).

Review consultant to the Potash Company of America on the rock mechanics program being carried out at the Penobsquis underground salt mine in New Brunswick.

Consultant to the Greek Public Power Corporation on the Messochora, Ilarion and Thesavros hydroelectric projects in north-eastern Greece.

Publications

Author of over 70 papers on experimental stress analysis, brittle fracture, laboratory equipment design, rock slope stability and underground excavation design and, with J.W. Bray, of a textbook, *Rock Slope Engineering* and, with E.T. Brown, of a textbook, *Underground Excavations in Rock*. These books have been translated into Chinese, Japanese, Spanish and Turkish.

Rock mechanics courses

Responsible for presenting courses, of approximately 1 week duration, on theoretical and applied rock mechanics for practising engineers in: Zambia (1974), Australia (1975, 1980, 1984, 1985), India (1979), Argentina (1979), China (1981, 1986), Canada (1981, 1985, 1986, 1988, 1989), England (1982), Taiwan (1982), Hong Kong (1983), U.S.A. (1983, 1985, 1986)

General and advisory consulting appointments

The Australian Mineral Industries Research Association on the development of rock mechanics facilities for the Australian mining industry. (1970)

Instituto Geologico, Madrid, on the establishment of rock mechanics facilities for the Spanish mining industry. (1970)

Roan Consolidated Mines, Zambia, on the establishment of rock mechanics services for Mulira, Luanshaya, Chambishi and Kalengwa Mines. (1972)

The United Kingdom Overseas Development Administration on training engineers in India for hydroelectric developments in the Himalayas. (1978)

Ontario Ministry of Labour. Review of rock mechanics teaching and research facilities for mining engineers in Ontario, Canada. (1985)

University of British Columbia. Review of Geological Engineering Program. (1985)

Member of the Underground Technology Advisory Panel for the Superconducting Super Collider, a 100 km circumference circular tunnel for a 20-trillion-electron-volt proton synchrotron proposed by American physicists. (1985)

University of California, Berkeley. Review of Geological Engineering Program. (1986)
Ontario Ministry of Northern Development and Mines and the Ontario Mining Association. Consultant on the establishment of a Mining Research Directorate to coordinate mining research in Ontario. (1986)
Atomic Energy of Canada Ltd.. Review of proposed research programs to be carried out in the underground research laboratory at Pinawa, Manitoba over the next 10 years. (1989)

Experience in slope stability

De Beer's Diamond Mine, South Africa. Preliminary slope stability evaluation for open pit diamond mine. (1965)
Rio Tinto Espanol, Spain. Rock slope stability evaluation for Atalaya Open Pit Copper Mine. (1967)
Bougainville Copper Ltd., Papua New Guinea. Established a slope stability program and responsible for detailed reviews of rock slope and waste dump problems approximately every two years. (1968 - 1984)
Roan Consolidated Mines, Zambia. Preliminary stability studies in the Kalengwa and Chambishi open pit copper mines. (1969)
Palabora Mining Company, South Africa. Established a slope stability program and made periodic reviews of rock slope and waste dump stability. (1970)
Gortdrum Mines, Ireland. Slope stability studies and regular reviews until completion of the mining program. (1971)
Amalgamated Roadstone, England. Slope stability studies and design of remedial measures for Batts Coombe Quarry. (1972)
City of Bristol, England. Cliff stability studies and design of remedial works in the Avon Gorge. (1973)
Hong Kong Government. Study of highway slope stability problems and preparation of rock slope design handbook. (1973)
Rio Tinto Zinc. Preliminary feasibility studies for proposed copper mine in Wales, United Kingdom. (1973)
Tara Mines Ltd., Ireland. Preliminary slope stability studies for proposed lead/zinc open pit mine. (1973)
Dinorwic Pumped Storage Hydroelectric Project, Wales, United Kingdom. Rock slope stability evaluation. (1973)
Ertsberg Open Pit Copper Mine, Irian Jaya, Indonesia. Preliminary slope stability studies. (1974)
Hong Kong Government. Expert witness on rock slope stability in a quarry associated with the Plover Cove Project. (1975)
Samper Cement, Colombia. Consultant on stability problems associated with the development of a new limestone quarry. (1975)
Sishen Open Pit Iron Ore Mine, South Africa. Preliminary slope stability studies. (1975)
Rossing Mine, Namibia. Slope and underground excavation stability studies and establishment of slope stability program. (1976)
Lornex Mine, British Columbia, Canada. Review of slope stability problems. (1976)
Cardinal River Coals, Alberta, Canada. Consultant on slope stability problems. (1976)
British Columbia Hydro and Power Authority, Canada. Direction of and participation in geotechnical study for proposed Hat Creek open pit coal mine. (1976)
Sidi Saad Dam, Tunisia. Consultant to Skanska Cementgjuterei, Sweden, on the stability of a large spillway excavation. (1978)

Fushun West Open Pit Coal Mine, People's Republic of China. Project Director for geotechnical study (in conjunction with Fluor Mining and Metals Inc., California) on slope stability problems. (1982)

Guavio Hydroelectric Project, Colombia. Consultant to Empresa Energia Electrica de Bogota and World Bank on quarry stability problems. (1984)

Leona Quarry, Oakland, California. Consultant on stability. (1984)

Review consultant to Haley Aldrich on quarry stability in Boston, Massachusetts. (1984)

Bingham Canyon Open Pit Mine. Review consultant to Kennecott Copper Corp. on slope designs. (1984)

British Columbia Hydro and Power Authority, Canada. Member of an advisory consulting board on a potential landslide above an existing reservoir. (1985-1987)

Panama Canal Commission, Panama. Review consultant on slope stability analysis for studies on the widening of the Panama Canal. (1985)

Mount Newman Mining, Western Australia, Review consultant on open pit slope stability problems. (1985-1987)

Koolan Island Mine, Western Australia, Review consultant on open pit slope stability problems. (1985)

Tong Lushan open pit copper mine, Peoples Republic of China, Review consultant on slope stability. (1986)

Experience in underground excavation design

Western Deep Levels Gold Mine, South Africa. Preliminary theoretical design studies of haulage layout. (1963)

Merrispruit Gold Mine, South Africa. Member of a team which investigated the failure of two concrete shaft plugs which resulted in the flooding of the mine. (1965)

Shabani Asbestos Mine, Rhodesia. Preliminary studies for the mine's block caving operation. (1965)

Witbank Collieries, South Africa. Initiation and participation in a program for large scale coal pillar crushing tests. (1965)

Portage Mountain Hydroelectric Project. Review of underground excavation support design for International Power and Engineering Consultants Ltd., Vancouver, Canada. (1971)

Mogul Mines, Ireland. Consultant on pillar recovery in backfilled open stope lead/zinc mine. (1973)

Grangesberg Blockcaving Iron Ore Mine, Sweden. Member of an international consulting panel on hanging wall stability. (1973)

Cobar Mines, NSW, Australia. Review of underground support methods. (1973)

Dinorwic Pumped Storage Hydroelectric Project, Wales, United Kingdom. Consultant to James Williamson and Partners on underground excavations in slate for 1800 mw pumped storage project. (1973)

Drakensberg Pumped Storage Hydroelectric Project, South Africa. Review consultant to Gibb Hawkins and Partners on underground excavations in weak interbedded sedimentary rocks for 1000 mw pumped storage project. (1973)

Rio Grande Pumped Storage Project, Argentina. Consultant to Agua y Energia Electrica and Studio Pietrangeli and direction of geotechnical studies and construction supervision for rock reinforcement for underground excavations in gneiss for 1000 mw pumped storage project. (1979)

Bumbuna Hydroelectric Project, Sierre Leone. Consultant to Studio Pietrangeli of Rome on tunnel support. (1979)

Consultant to Cominco Ltd. on rock mechanics problems in the Sullivan Mine, British Columbia, Canada, Rubiales Mine, Spain, Con Mine, Northwest Territories, Canada (1979), Polaris Mine, Little Cornwallis Island, Canadian Arctic (1980, 1983)

Cherokee and Calloway Mines, Tennessee, U.S.A. Consultant to the Tennessee Chemical Company on underground rock mechanics problems. (1980, 1983)

Agua y Energia Electrica, Argentina. Consultant on geotechnical aspects of the proposed Cordon del Plata Hydroelectric Project in Argentina. (1980).

Gaspe Copper Mine, Quebec, Canada. Consultant to Noranda Mines on pillar stability problems. (1980)

Getty Oil Ltd. Consultant on pillar design for oil shale mining in Colorado, U.S.A. (1981)

Cat Arm Hydroelectric Project, Newfoundland, Canada. Consultant to Cat Arm Consultants Ltd. on geotechnical aspects of unlined high pressure shaft and rock slopes in granite. (1982)

Quirke Mine, Ontario, Canada. Consultant to Rio Algom Ltd. on underground mining and rock mechanics problems. (1982)

Selebi and Phikwe Mines, Botswana. Consultant to BCL Ltd., on pillar recovery in underground mines. (1982)

Mingtang Pumped Storage Project, Taiwan. Consultant to Sinotech Engineering Co. Inc. on the design and construction of 1600 mw underground hydroelectric project in weak interbedded sedimentary rocks. (1982-1989)

Donkin-Morien Mine, Nova Scotia, Canada. Consultant to Cape Breton Development Corp. on 4 km long boring machine driven access tunnel to proposed undersea coal mine. (1983)

Black Angel Mine, Greenland. Consultant to Greenex A/S, Copenhagen, on rock mechanics aspects of pillar recovery. (1983)

Flin Flon Mine, Manitoba, Canada. Consultant to the Hudson Bay Mining and Smelting Co. Ltd. on underground stability. (1983)

Gregory County Pumped Storage Project, South Dakota, U.S.A. Consultant to the U.S. Army Corps of Engineers on feasibility of proposed underground pumped storage project in chalk. (1983)

Review consultant to United Geotech on design of 8 km railway tunnel in Taiwan. (1983)

Roger's Pass railway tunnel, British Columbia, Canada. Review consultant to Canadian Pacific Railways on support design for 9 mine long tunnel. (1984)

Cumberland Gap Tunnel, Tennessee, U.S.A. Review consultant to Federal Highway Authority on construction and support of a pilot tunnel for twin highway tunnels in interbedded sedimentary rock. (1983, 1985, 1989).

Review consultant to Moh and Associates on highway tunnel design in Taiwan. (1984)

El Sauce Hydroelectric Project, Peru. Review consultant to Shawinigan Engineering Consultants on tunnel design. (1984)

New Brunswick Mining and Smelting Co., New Brunswick, Canada. Review of underground mine excavation stability. (1983, 1985)

Monasavu Hydroelectric Project, Fiji. Technical expert for the Fiji Electricity Authority for tunnelling claim. (1985)

Consultant to Sir William Halcrow and Partners and to the government of Sri Lanka on pressure tunnel leakage problems in the Kotmale hydroelectric project in Sri Lanka. (1986-7)

Himalayan Power Consultants, Kathmandu, Nepal. Member of an international review panel to advise on selection of location and type of dam and associated powerhouse complex for the Chisapani project in Western Nepal. (1987, 1989)

San Francisco hydroelectric project, Ecuador. Consultant to Engineering Consultants Inc. of Denver on geotechnical aspects of the project. (1987)

New Tienlun Hydroelectric Project, Taiwan. Consultant to Sinotech Engineering Co. Inc. on the design and construction of an underground hydroelectric project. (1988-1989)

Potash Company of America underground salt mine, New Brunswick, Canada. Review of geotechnical program. (1988, 1989)

Morton Salt Company. Review of geotechnical program for Seleine underground salt mine, Magdelene Islands, Canada (1988)

British Columbia Hydro and Power Authority, Canada. Member of an advisory consulting board on a pressure tunnel failure in a hydroelectric project constructed in 1951. (1989 ongoing)

Greek Public Power Corporation. Review consultant on the geotechnical aspects of the Mes-sochora, Ilarion and Thesavros hydroelectric projects in north-eastern Greece.

Experience in dams and bridges

Bosphorus Suspension Bridge, Turkey. Consultant to Freeman Fox and Partners on foundation and abutment stability. (1972)

Magat Dam, Phillipines. Consultant to Engineering Consultants Incorporated on foundation stability problems. (1978)

Victoria Arch Dam, Sri Lanka. Member of a three-man review panel reporting to the United Kingdom Overseas Development Administration on the design and construction of 110 m high double-curvature concrete arch dam and a 6 km long pressure tunnel in gneiss. (1979-1984)

Kotmale Hydroelectric Project, Sri Lanka. Consultant to Skanska Cementgjutereit on the stability of waste dumps and foundation excavations. (1979)

Ridgeway Dam, Colorado, U.S.A. Consultant to the U.S. Bureau of Reclamation on foundation stability. (1980)

Consultant to the U.S. Corps of Engineers on the preparation of a Foundation Manual. (1983)

Navajo Dam, New Mexico. Consultant to the U.S. Bureau of Reclamation on leakage problems. (1984)

Kirindi Oya Project, Sri Lanka. Consultant to the Sri Lanka Irrigation Department and Asian Development Bank on spillway foundation stability. (1984)

Dry Gulch Bridge, British Columbia, Canada. Review consultant to the British Columbia Department of Highways on bridge foundation stability. (1984)

Near Island Bridge. Consultant to the State of Alaska, Department of Transport and Public Facilities on pier stability. (1985)

Xiaolangdi flood control and hydroelectric project, Peoples Republic of China. Review consultant on tunnelling and dam abutment stability. (1986)

Railway bridge on Fairbanks-Anchorage line, Alaska. Consultant on bridge foundation stability and remedial works. (1987)

List of publications

1. Hoek, E. (1960). The application of photoelastic models as a means of solving problems of stress and fracture around excavations at depth. *The Assoc. Mine Managers S. Afr.*, March 1960, 1055-1066.
2. Hoek, E. (1961). Experimental study of rock-stress problems in deep-level mining. *Proc. 1st Int. Conf. on Experimental Mechanics*, New York. (ed. Rossi), 123-145. New York: Pergamon, 1963.
3. Hoek, E. and Bieniawski, Z.T. (1963). A large field reflection polariscope. *S. Afri. Mech. Engr.* 12, No. 8, 222-226.
4. Hoek, E. and Bieniawski, Z.T. (1963). Application of the photoelastic coating technique to the study of the stress redistribution associated with plastic flow around notches. *S. Afri. Mech. Engr* 12, No. 11, 275-287.

5. Hoek, E. (1963). Rock mechanics research in South Africa. In *State of stress in the earth's crust*, Santa Monica (ed. W.R. Judd), 327-329. New York: Elsevier, 1964.
6. Hoek, E. (1964). Rock fracture around mining excavation. *Proc. 4th Int. Congr. on Strata Control and Rock Mechanics*, Columbia Univ., New York, 334-348.
7. Hoek, E. (1964). Fracture of anisotropic rock. *J. S. Afr. Inst. Min. Metall.* 64, No. 10, 501-518.
8. Hoek, E. (1965). The design of a centrifuge for the simulation of gravitational force fields in mine models. *J. S. Afr. Inst. Min. Metall.* 65, No. 9, 445-487.
9. Hoek, E. and Bieniawski, Z.T. (1965). Brittle fracture propagation in rock under compression. *Int. J. Fracture Mech.* 1, 137-155. Reprinted *Int. J. Fracture Mech.* 26, 1984, 276-294.
10. Hoek, E. and Bieniawski, Z.T. (1966). Fracture propagation mechanism in hard rock. *Proc. 1st Congr. Int. Soc. Rock Mech.*, Lisbon, 1, 243-249.
11. Cook, N.G.W., Hoek, E., Pretorius, J.P.G., Ortlepp, W.D., and Salamon, M.D.G. (1966). Rock mechanics applied to the study of rockbursts. *J. S. Afr. Inst. Min. Metall.* 66, 435-714.
12. Hoek, E. (1966). Rock mechanics - introduction for the practical engineer. Parts I, II and III. *Min. Mag.*, April, June and July 1966.
13. Hoek, E. (1966). A photoelastic technique for the determination of potential fracture zones in rock structures. *Proc. 8th Symp. on Rock Mech.*, Minnesota. In *Failure and breakage of rock* (ed. C. Fairhurst), 94-113. New York: Am. Inst. Min. Metall. Petrolm. Engrs, 1967.
14. Hoek, E. (1967). Brittle failure of rock. In *Rock mechanics in engineering practice* (eds. K.G. Stagg and O.C. Zienkiewicz), 99-124. New York: Wiley, 1968.
15. Black, R.A.L. and Hoek, E. (1967). Status of rock mechanics as applied to mining. *Proc. 9th Symp. on Rock Mech.*, Colorado School of Mines. 5-26, New York: Am. Inst. Min. Engrs, 1968.
16. Hoek, E. and Franklin, J.A. (1968). A simple triaxial cell for field and laboratory testing of rock. *Trans. Instn. Min. Metall.* 77, A22-A26.
17. Hoek, E. and Pentz, D.L. (1969). Review of role of rock mechanics research in the design of open pit mines. *Proc. 9th Commonwealth Mining and Metallurgical Congr.*, London.
18. Hoek, E. and Sharp, J.C. (1970). Improving the stability of rock slopes by drainage. *Proc. Symp. on Planning Open Pit Mines*, Johannesburg. 193-198, Rotterdam: A.A. Balkema, 1971.
19. Hoek, E. (1970). Design of charts for excavated slopes. *Proc. Symp. on Planning Open Pit Mines*, Johannesburg. 295-302, Rotterdam: A.A. Balkema.
20. Hoek, E. (1970). Estimating the stability of excavated slopes in opencast mines. *Trans. Instn. Min. Metall.* 79, No. 767, A109-A132.
21. Franklin, J.A. and Hoek, E. (1970). Developments in triaxial testing technique. *Rock Mech.* 2, No. 4, 223-228.
22. Hoek, E. (1970). Influence of structure on the stability of rock slopes. In *Stability in open pit mining* (eds. C.O. Brawner and V. Milligan), 46-63. New York: Am. Inst. Min. Engrs, 1971.
23. Hoek, E. (1970). Conference summary. In *Stability in open pit mining* (eds. C.O. Brawner and V. Milligan), 239-242. New York: Am. Inst. Min. Engrs, 1971.
24. Hoek, E. (1971). Rock slope stability - how far away are reliable design methods? *Proc. 1st Australia-New Zealand Geomechanics Conf.*, Melbourne, 1, 307-313.
25. Hoek, E. (1971). Rock engineering. *Inaugural Lecture as Professor of Rock Mechanics*, Imperial College, Univ. of London.
26. Roberts, D.T. and Hoek, E. (1971). A study of the stability of a disused limestone quarry face in the Mendip Hills, England. 2nd Int. Conf. on Stability in Open Pit Mining, Vancouver. In *Geotechnical practice for stability in open pits* (eds. C.O. Brawner and V. Milligan), 239-256. New York: Am. Inst. Min. Engrs, 1972.

27. Hoek, E. (1972). The teaching of rock mechanics. *Rock Mech.* 4, No. 3, 135-138.
28. Hoek, E. (1971). Recent slope stability research at the Royal School of Mines, London. *2nd. Conf. on Stability in Open Pit Mining*, Vancouver. In *Geotechnical practice for stability in open pit mining* (eds. C.O. Brawner and V. Milligan), 23-46. New York: Am. Inst. Min. Engrs, 1972.
29. Roberts, D.T., Hoek, E. and Fish, B. (1972). The concept of the mammoth quarry. *Quarry Managers J.* 56, No. 7, July 1972, 229-238.
30. Sharp, J.C., Hoek, E. and Brawner, C.O. (1972). Influence of groundwater on the stability of rock masses. Part II - Drainage systems for increasing the stability of slopes. *Trans. Instn. Min. Metall.* 81, No. 788, A113-A120.
31. Hoek, E. (1972). Rock mechanics. A look to 1980 and beyond. *Symp. on Rock Mechanics*, Dhanbad, India. 185-197. Calcutta: Inst. Engrs, 1973.
32. Hoek, E. (1973). Methods for the rapid assessment of the stability of three-dimensional rock slopes. *Q.J. Engng Geol.* 6, No. 3/4.
33. Hoek, E., Bray, J.W. and Boyd, J.M. (1973). The stability of a rock slope containing a wedge resting on two intersecting discontinuities. *Q. J. Engng Geol.* 6, No. 1, 1-55.
34. Hoek, E. and Londe, P. (1974). Surface workings in rock. General Report. *3rd Congr. Int. Soc. Rock Mech.*, Denver. VI, Part A, 613-752. Washington, DC: Nat. Acad. Sci.
35. Hoek, E. and Bray, J.W. (1974). *Rock slope engineering*. London: Instn. Min. Metall.
36. Hoek, E. (1974). Progressive caving induced by mining an inclined orebody. *Trans Instn. Min. Metall.* 83, No. 815, A133-A139.
37. Hoek, E. (1975). Bibliography on the geotechnical problems associated with the construction of large permanent underground excavations with particular emphasis on underground hydro-electric power plants. *Int. J. Rock Mech. Min. Sci.* 12, No. 2.
38. Hoek, E. (1975). Influence of drilling and blasting on the stability of slopes in open pit mines and quarries. *Proc. Atlas Copco Bench Drilling Days Symp.*, Stockholm.
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