Evert Hoek (1933-2024)

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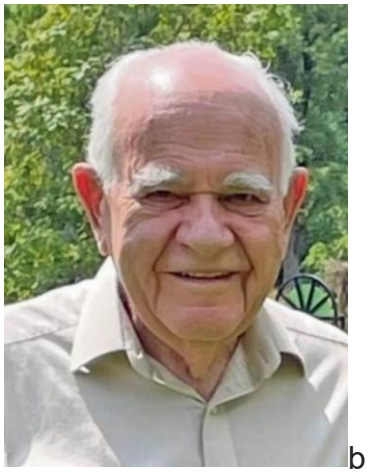 b

Dr. Evert Hoek passed away on July 6, 2024 at the age of 90 years, after a brief illness. He was born in Rhodesia (now Zimbabwe) in 1933 and obtained his bachelor's and master's degrees in mechanical engineering from the University of Cape Town (South Africa). His 1958 master's thesis was on photo-elastic stress analysis. Hoek then worked with the South African Council for Scientific and Industrial Research where he became involved in the, then, young science of rock mechanics and started his research on the problems of brittle fracture associated with rock bursts in very deep gold mines in South Africa. Hoek returned to the University of Cape Town for his PhD in rock mechanics and graduated in 1965. His thesis was on the brittle fracture of rock.

In 1966, Hoek was asked to establish the Centre for Teaching and Research at the Royal School of Mines at the Imperial College of Science and Technology, University of London. Four years later he was appointed London University Professor of Rock Mechanics and, in 1975, he was awarded a DSc (Eng) by that institution. The same year, Hoek left Imperial College and immigrated to Vancouver, BC, where he joined Golder Associates as a Principal. In 1987, he joined the University of Toronto as an Industrial Research Professor, retiring from academia in 1993. While at the University of Toronto, Hoek supervised a number of graduate theses that became the basis of several software codes that are now part of the Rocscience suite. Until his full retirement in 2018, Hoek worked as an independent consultant on review and consulting boards around the world associated with civil and mining engineering projects involving rock slopes, dam foundations, hydroelectric projects, underground caverns and tunnels.

While at Imperial College, Hoek developed, among other tests, a triaxial test for rock. In 1980, he and Edwin (Ted) Brown introduced the Hoek–Brown failure criterion for intact rock to provide input for the design of underground excavations in rock. The criterion was later expanded to incorporate the whole rock mass, considering both intact rock and discontinuities (such as joints) by means of field characterization of the discontinuities using the geological strength index (GSI). Paul Marinos was a key collaborator in the development of GSI for weak rock masses such as those found in Greece. The Generalized Hoek-Brown shear strength criterion (2002), which includes GSI and other parameters, has become an internationally

popular method to quantify the geomechanical strength of rock masses and provide input to numerical models.

During his career, Hoek published more than 100 papers and co-authored three books: *Rock Slope Engineering* (1974) with John Bray, *Underground Excavations* in Rock (1980) with Edwin Brown, and *Support of Underground Excavations in Hard Rock* (1995) with Peter Kaiser and Will Bawden. In 1995, Hoek with Alan Imrie, co-authored a seminal paper outlining the effectiveness and need for consulting review boards for large civil engineering projects. At Hoek's request, all of his significant publications, a 16-chapter eBook entitled *Practical Rock Engineering* and six professionally made videos on rock mechanics and rock engineering are available for free download from Rocscience's website, https://www.rocscience.com/learning/hoeks-corner.

Nationally, in 2007, Hoek was awarded the CGS Engineering Geology Division's Thomas Roy Award and, in 2016, he was an invited keynote speaker at the 5th CGS Young Professionals Conference in Whistler, BC. In 2024, the Canadian Rock Mechanics Association, the Canadian National Group of the International Society for Rock Mechanics and Rock Engineering, established a named award, the Dr. Evert Hoek Master's Thesis Award, in honour of Hoek's many contributions to rock mechanics and rock engineering.

Internationally, Hoek received the inaugural Müller Award from the International Society of Rock Mechanics and was the 1983 Rankine Lecturer (Strength of jointed rock masses), the 2nd Glossop Lecturer in 1999 (Putting numbers to geology – an engineer's viewpoint) and the 2000 Terzaghi Lecturer (Big tunnels in bad rock).

In addition to his DSc (Eng) from the University of London, Hoek was awarded honorary doctorates from the University of Waterloo, the University of Toronto and the Polytechnic University of Catalonia (UPC). He was elected a Fellow of the Royal Academy of Engineering (UK), a Foreign Associate of the US National Academy of Engineering and a Fellow of the Canadian Academy of Engineering.

Evert Hoek was predeceased by his first wife, Theo, and is survived by his second wife, Bonnie, as well as his son, Peter, and daughter, Dorothy, and several grandchildren. He was adored by his family, as well as loved and respected by his many colleagues and students.