Press release about Professor Bieniawski

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“Bieniawski says Farewell to Tunnelling with Memorable Lecture”

The Closing Ceremony of the World Tunnel Congress 2014 in Foz do Iguaçu, was accompanied by much emotion. On stage was **Z. T. Richard Bieniawski von Preinl**, Emeritus Professor of Mineral Engineering of the Pennsylvania State University and President of Bieniawski Design Enterprises. One of the most experienced professionals in Rock Engineering in the world, Bieniawski gave an unforgettable lecture to the Congress participants, who filled the auditorium to capacity at the Bourbon hotel, the site of the Congress.

Internationally recognized in the areas of tunnelling and mining, Bieniawski has more than 50 years of experience in practical engineering, academia and research. He is responsible for the development of the Rock Mass Rating System (RMR), an index of rock mass quality for geotechnical applications, used worldwide on tunneling projects. The RMR system combines the most significant geological parameters and represents them as an overall index, utilized in tunnel design and construction.

In his lecture, Professor Bieniawski emphasized the importance of continuous learning among the specialists responsible for tunnel design and construction. He cited the American author Alvin Tofler, referring to him twice during his address, “The illiterate of the 21st century will not be those who cannot read or write, but those who cannot learn, unlearn and relearn”.

In the same spirit, for those who want to ensure their professional integrity devoid of failure, the Professor said: “It is not the things that we do not know that cause us problems, but the things that we think that we know with certainty”.

After laying the groundwork with such quotations, Bieniawski started his address by dealing with the methodologies of tunnel design, the importance of education and of research. “Be specific when describing your design methodology and use it as a check list. Moreover, be aware of the three elements that any modern profession must contain: theory, education and practice – they are absolutely necessary to guarantee its renewal and development”.

Another challenge pointed out by the Professor was the lack of professionals specifically trained in the areas of tunnel construction and planning. Studies of major universities, among 200 civil engineering departments surveyed showed that less than 10% had specialized programs in rock tunneling and rock mechanics; those that did were mainly mining departments, and the programs tended to be small.

“Therefore we must train tunnel engineers and contractors and educate better those in charge of planning; the tunnel community should offer such opportunities. For this purpose, let us help find funding for industrial courses, and write articles in the press about the benefits of tunnelling to society. We have to ask ourselves what we can do to attract good students to our fascinating profession”.

The Professor next presented two current news items, one negative and one positive, regarding the tunneling market. The first one concerns cost control in that field: “tunnel and mine owners try to cut budgets to reduce costs and the result is less spending for site investigation. High technology and colorful graphics are used, which are impressive, but insufficient. Budgeted costs for site exploration should account for 3% of the total cost of the project. Today, the levels are less than 1%.”

The good news is that the front cover of a recent issue of the magazine The Economist asserted that tunnel construction will reach a record length of over 1000 km in 2014. “As South American potential is huge, this should encourage governments to become more aggressive in tunnel construction, as an answer to ever increasing traffic jams in the big cities”.
The current tendency is a greater development in mechanized tunnelling techniques, featuring tunnel boring machines (TBMs). Tunnels will be built at ever-greater depths, of larger size and in conditions of greater water pressures.

At the end of his lecture, Professor Bieniawski congratulated the organizers of the WTC 2014 for a very successful Congress and he announced that he will be retiring from tunnel engineering, after 50 years of activities.

“This is the time to retire my hard hat. Therefore, while I conclude my professional activities, it is with much joy that I want to share with you my personal secret for high satisfaction in our chosen profession - this is to involve your spouses and life partners in your work! Believe me, a happy spouse is a great investment for a happy and successful career”.

Then he concluded: “Finally, I wish to ask you all: what is the best idea that you have acquired at this Congress? And let me close with this message to guide you: Enthusiasm is the greatest asset in the world; it surpasses money, power and influence”.

Professor Bieniawski received a standing ovation from the audience that filled the auditorium.

Professional Career

Professor Z. T. Richard Bieniawski von Preinl was born in Kraków, Poland. He studied at Gdansk Technical University, Poland, and later at the Witwatersrand University, in Johannesburg, South Africa, receiving a degree in Mechanical Engineering. In 1967, he obtained the degree of Doctor of Science in Mining Engineering from the University of Pretoria, South Africa. From 1966 to 1978, he was Director of the Department of Rock Mechanics at the Council of Scientific and Industrial Research, in Pretoria. He accepted the post of Professor of Mineral
Engineering at the Pennsylvania State University, USA, in 1977, where he taught mining, civil and mechanical engineering for 20 years.

In 2001, Universidad Politécnica de Madrid honored him with the title of Doctor Honoris Causa, as well as Ilustrísimo Professor of the Claustro Extraordinario (Council of Spanish Professors). Subsequently, his name was given to a lecture hall (Bieniawski Aula) in the Escuela Superior de Minas, and the company Geocontrol S.A. created a scholarship bearing his name, Bieniawski Beca.

In 2010, the AGH University of Science and Technology in Kraków, Poland, his birthplace, honored him with the title of Doctor Honoris Causa and Visiting Professor in Mining and Civil Engineering.

During his career of over 50 years, Professor Bieniawski is the author of over 200 scientific articles and 10 books (some of which have been translated into Spanish, German, Polish, Russian, Chinese and Korean). He was the supervisor and advisor of 28 doctoral and master students; some of whom are now professors and scientists and five are directors of industrial companies in tunnelling and mining.

In 1985, Professor Bieniawski was awarded the highest honor in Rock Mechanics by the American Institute of Mining, Metallurgical and Petroleum Engineers for his contribution to scientific research and practical applications of Rock Mechanics to mining and tunneling.

In addition, he served as Chairman of the USA Committee on Tunneling Technology in 1985 and was the US representative to the International Tunneling Association (ITA). He was also elected Vice President for Africa of the International Society of Rock Mechanics (ISRM) between 1974 and 1979. In his career, he has acted as a consultant in 23 countries, working as an advisor for 48 companies in 66 projects in Europe, Asia, South America, North America, Africa and Australia.

The Closing Lecture by Professor Bieniawski was sponsored by the company Geocontrol SA, one of the supporters of WTC 2014.

Fotos: Silvio Vera e Vanessa Sudatti