

SPOTLIGHT

on 1986 Brigadier Stokes Award

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In 1980 The South African Institute of Mining and Metallurgy instituted the Brigadier Stokes Memorial Award to commemorate the outstanding contribution to the South African mining industry made by Brigadier R.S.G. Stokes, who was an Honorary Life Fellow and a Past President of the Institute. The award consists of a platinum medal and a cash award, and is made to an individual for the very highest achievement in the South African mining and metallurgical industry.

1986 Winner

This year the Brigadier Stokes memorial award was presented to Professor Miklós Dezső György Salamon for his contribution to the advancement of mining technology in general, and the development of mining rock mechanics in particular. Traditionally, the award is made at the Annual General Meeting of The South African Institute of Mining and Metallurgy, but circumstances this year dictated a departure from this procedure. The organizers of GOLD 100 kindly agreed that the Institute could take the opportunity of the Conference to honour Professor Salamon.

Life History

Miklós Salamon was born in Hungary, where he received his university education at the Polytechnical University in Sopron. In 1956 he graduated with distinction as a mining engineer. Following the October Revolution in 1956, he and his young family were forced to leave Hungary and, after a traumatic period as refugees, settled in Newcastle-on-Tyne in Great Britain. After spending two years as a trainee mining engineer with the National Coal Board, he joined the staff of the Department of Mining Engineering at the University of Durham as a Research Associate. In 1962 he was awarded a Ph.D. degree in applied science for a fundamental study on mining-induced surface subsidence. He emigrated to South Africa in 1963 to join the staff of the Government Mining Engineer as Director of Research of the Coal Mining Research Controlling Council, which was instituted after the Coalbrook mining disaster in 1960. Miklós Salamon joined the staff of the Research Organization of the Chamber of Mines as Director of the newly formed Collieries Research Laboratory in 1966. Eight years later he was appointed Research Adviser to the Chamber of Mines of South Africa, a position he held until May 1986, when he decided to return to the academic world to head the Department of Mining Engineering at the Colorado School of Mines and to direct the work of the Mining Research Unit attached to the school.

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Professor M.D.G. Salamon, winner of the 1986 Brigadier Stokes Award

In his twenty-three years of direct association with the South African mining industry, Professor Salamon made a permanent impression on the industry and influenced its development in many significant ways. His contributions can be grouped into three distinct areas: science and technology, mining policy, and the mining profession.

Contribution to Science and Technology

On an international level, his contribution to the development of mining rock mechanics and mining technology are probably best known and acknowledged. The unique combination of a powerful analytical mind and a sense for the practical solution of complex engineering problems have made Professor Miklós Salamon one of the outstanding individuals in the mining world. His contributions to the South African mining industry are numerous. Only two are mentioned here in any detail.

After the Coalbrook disaster in 1960, when a collapse involving several thousand coal pillars resulted in the loss of 440 lives, the question of the design of bord-and-pillar workings in local collieries was one of greatest concern. Instead of embarking on the traditional approach of determining the strength of coal pillars on the basis of strength tests in the laboratory, Professor Salamon adopted a completely different approach—the back analysis of intact and failed bord-and-pillar workings by

the use of powerful statistical techniques. His design approach for bord-and-pillar workings became the standard procedure, not only locally, but also in many other parts of the world. In South Africa alone, several million coal pillars have been designed on this basis, and the results to date have confirmed the validity of his predictions.

The most serious problem facing deep gold mines is that caused by rock failures as a result of high rock stresses. As early as 1908, when the first of several commissions to investigate rock failures, particularly rockbursts, was appointed, the problem of rock pressure was recognized as the major threat to the future of gold mining. Progress in finding solutions was slow largely owing to a lack of understanding of the fundamental processes and an inability to predict and to quantify rock stresses in deep mines. Professor Salamon realized that, except for the thin layer of fractured rock surrounding underground excavations, the overall response of the rock mass to mining was elastic. In a series of fundamental papers, for which he was awarded the gold medal of The Institute of Mining and Metallurgy in 1964, he developed the theoretical basis for the analysis of stresses and displacements induced by the mining of tabular deposits. In particular, he introduced the 'face element' principle on which all modern methods of stress analysis for tabular deposits are based. However, he was not satisfied with the establishment of theoretical concepts. His real concern was to apply these to the problem of rock pressure in deep mines.

Many new concepts of mine design, stoping layouts, shaft protection, and rockburst control strategies can be traced back to him. The importance of his pioneering work can be judged by the confidence that the industry has gained, a confidence that has led to the establishment of ultra-deep mines, which extend in depth to well beyond the levels considered feasible only ten years ago.

Professor Salamon's contribution to mining rock mechanics has been recognized both locally and internationally. In 1971 he and his co-workers at the Research Organization of the Chamber of Mines were presented with the highest scientific award in South Africa—the gold medal of the Associated Scientific and Technical Societies for outstanding contributions to the science of rock mechanics and its application to mine design. In 1983 he was awarded the gold medal of the Society of Mining Engineers of the American Institution of Mining Engineering for his contribution to the advancement of the science of rock mechanics.

Contribution to Mining Policy

However, Professor Salamon's contribution to the South African mining industry goes far beyond the

development and application of rock mechanics as a mining science. In 1974, when he was appointed Research Adviser to the Chamber of Mines, he realized the need for a well-structured, long-term research-and-development programme for the industry. In consultation with senior executives in the industry, he identified major problem areas that threatened the long-term profitability of the industry. He re-structured the Research Organization of the Chamber of Mines to address these problem areas in the most effective manner. Today, the industry's Research Organization is one of the leading mining research establishments in the world and enjoys high international recognition. The departure, under his guidance and leadership, from a discipline-oriented to a problem-oriented organization can serve as an example for many other research establishments.

Apart from being an outstanding scientist and engineer, and a research director of exceptional vision, Professor Salamon served the South African mining industry in many ways. His wisdom and advice were recognized by many organizations, not only within the mining industry, but also outside. He represented the industry on numerous policy committees and served on several Commissions of Inquiry into mine accidents and occupational diseases. In addition, he served on the advisory boards of many organizations, among them the Scientific Advisory Council of the Prime Minister.

Contribution to the Profession

The third outstanding feature of Professor Salamon's has been his dedicated service to the profession. From an early stage, he involved himself in the activities of The South African Institute of Mining and Metallurgy. He served on the Council of the Institute from 1970 until his departure to the Colorado School of Mines, and was President of the Institute for the Council year 1976/77. His main concern was, and still is, the training and education of mining engineers and the transfer of technology. In both areas, he made permanent contributions to the mining industry both locally and abroad. As part-time Senior Lecturer and, later, Honorary Professor of Mining Research in the Department of Mining Engineering at the University of the Witwatersrand, he guided a whole generation of mining engineers and many post-graduate students, who benefited from his knowledge and undoubted ability to make difficult problems appear simple.

Professor Salamon authored more than 60 technical papers and was the co-author of two books on rock mechanics. Through his written work, he has made significant contributions to the development of mining engineering in South Africa and world-wide, which will withstand the test of time.