

## HONORARY GRADUATE

### Gerrit van Rooyen Marais

Gerrit van Rooyen Marais was born on 20 December 1927. After serving as an apprentice fitter and turner in the South African Railways and lecturing at the Port Elizabeth Technical College, he commenced university studies at the age of 26. In 1955 he obtained the degree of Bachelor of Science in Civil Engineering from the University of Cape Town. Thereafter he spent two years as a research engineer in the mining industry, followed by six years with the then Northern Rhodesian Housing Board doing research in low-cost housing, water supply and sanitation. During this time he pursued postgraduate studies at the Imperial College University in London, and was awarded the Diploma of Membership of the Imperial College in Public Health Engineering in 1963. In 1965 Gerrit Marais was awarded the degree of Master of Science in Engineering of this university. The research that he conducted during this time resulted in nineteen publications in the low-cost water-supply/sanitation area. One of these publications described a novel instrument for measuring dissolved oxygen in oxidation ponds, for which he was awarded a prize by the South African Institute of Civil Engineers in 1967 for the most innovative short paper. The quality of the research from this first phase of his career as a practising sanitary engineer was such that in 1970 he was appointed a member of the Expert Committee on Environmental Sanitation of the World Health Organization (a position he held until 1987) and in 1972 was invited to the United States of America by the American Society of Sanitary Engineering as Distinguished Foreign Professor.

After a brief spell as Senior Lecturer in Soil Mechanics at this university, the second and most successful phase of Gerrit Marais's research career in sanitary engineering commenced in 1967 when he was appointed to the Chair of Water Resources and Public Health Engineering at the University of Cape Town. Professor Marais's main research interests during this time have been in municipal water and wastewater treatment, covering such topics as water chemistry and water conditioning, biological-nitrogen and phosphorus removal from municipal wastewater and, more recently, anaerobic digestion and filamentous bulking control in activated sludge systems. As a result of his indefatigable research activity after his appointment as professor, he was elected a Fellow of the University of Cape Town for distinguished research in 1977 and in 1984 was awarded the degree of Doctor of Science in Engineering, a higher doctorate, by the University of Cape Town. His was one of only four such degrees awarded by that university in the past seventy-five years. On two occasions he was appointed short-term consultant by the World Health Organization, in 1976 to Brazil and in 1980 to Colombia, to advise on wastewater treatment problems. In 1983 he, with four other research scientists/engineers was appointed by the International Association for Water Pollution Research and Control (IAWPRC) to serve as an International Task Group for modelling biological wastewater treatment plants, and in 1987 he was elected executive committee member of the IAWPRC Nutrient Study Group. On two occasions he has been invited as plenary speaker at International Conferences to present state-of-the-art review papers in the field of biological nutrient removal, the first time in 1985 for the Italian National Water Research Institute and then in 1987 for the Australian Water and Wastewater Association Federal Convention.

In recognition of his exacting standards of scientific research in an area of engineering which is extremely complex and empirical, Gerrit Marais was elected a Fellow of the Royal Society of South Africa in 1989, one of very few engineers who have won this distinction. In 1990 he was awarded the Association of Scientific and Technical Societies' prize for research in and development of the biological-nitrogen and phosphorus removal activated sludge system.

On the many occasions that Gerrit Marais has been honoured for his tireless contribution to sanitary engineering, both nationally and internationally, he has always paid tribute to his students. Up to now thirty-four Master of Science in Engineering and ten Doctor of Philosophy students have studied under his guidance. His exacting standards of research are summed up in some of his adages such as 'the path to bad research is strewn with good excuses' and 'I don't want your work to be good enough, I want your best'. He has published seven books and one hundred and forty scientific papers together with his students and colleagues. He is recognized today as one of the world's experts in sanitary engineering who, through his incisive thinking and thorough research technique, has instilled confidence in biological-nitrogen and phosphorus removal to the extent that it is the preferred technology for municipal wastewater treatment in South

Africa today. With the need to remove nitrogen and phosphorus wastewater becoming increasingly urgent, the United States, Europe and Australia are now looking for inspiration and guidance to South Africa's biological-nutrient removal success story to which Gerrit Marais has made a major contribution.

In 1992 Gerrit Marais retired from his Chair of Water Resources and Public Health Engineering, but he continues to be active in research as Emeritus Professor at the University of Cape Town.

This university, in recognition of his outstanding contribution in the field of wastewater treatment and public-health engineering, to both South Africa and the world at large, is honoured to confer upon Gerrit van Rooyen Marais the degree of Doctor of Science in Engineering *honoris causa*.