Southern Africa Association for the Advancement of Science
Suider-Afrika Genootskap vir die Bevordering van die Wetenskap

Rudolf Marloth
Brochure - Brosjure

Annual award ceremony: November 2002

The South Africa Medal (gold):
Awarded to Prof William F Harris

Prof William F Harris

The South Africa Medal (gold) is awarded annually to recognise exceptional contributions to the advancement of science on a broad front or in a specific field, by an eminent South African scientist. Prof. Harris received this prestigeous award in recognition of his fundamental contributions to ophthalmic optics. He supplied the following autobiography:

A bursary from the Chamber of Mines allowed me to complete a BSc(Eng) in Chemical Engineering at the University of the Witwatersrand in 1962, after which I worked on gold extraction at the Government Metallurgical Laboratory. With a research assistantship at the University of Minnesota, despite being an extremely bad student, I managed to obtain a MSc in Chemical Engineering and Mathematics for a thesis entitled The mechanism of collapse of monomolecular films at fluid/fluid interfaces. Back in South Africa I spent a couple of years in the Department of Physics at Wits working on fundamental mechanisms of fracture. Here, with Professor F R N Nabarro as chairman, I became acquainted with the crystal dislocation, a concept which was to capture my imagination and define my research for the next 20 years. My PhD was obtained at the University of Minnesota with Professor L E Scriven as advisor and with a thesis entitled Defects in surface crystals. A highlight for me was my description of the dispiration, published in Philosophical Magazine. The defect was observed for the first time some 12 years later in crystalline polymers. My interests then were turning strongly towards the application of concepts from solid state physics, and the physical sciences in general, in the life sciences. I published on the geometry of virus capsids, the mechanism of infection of bacteria by bacterial viruses and the mechanism of movement of bacteria and spermatozoa. I returned to the Department of Chemical Engineering at Wits where I was given the job of lecturing Chemical Engineering, Thermodynamics and Biochemical Engineering. I was later appointed Professor of Micro-Biomechanics with

honorary appointments in the Department of Physics and the Department of Botany and Microbiology.

By 1984 my research ideas were drying up; I began searching for new inspiration. Professor Selwyn Super had just started the Department of Optometry at Rand Afrikaans University. That, together with my own high myopia, suggested that here might be an opportunity to combine my interests in mathematics and the physical and biological sciences in vision. At the age of 44, and with a very tolerant and understanding wife, I packed in my professorship and started from scratch as an optometry student at RAU. In January 1987 came a second turning point that was to define my research until today. At the last minute the lecturer for Ophthalmic Optics became unavailable. I took on the job, not half a step ahead of the class. It seemed to me that the optics that underlay much optometric and ophthalmological practice was not really sound, that it was inhibiting development in vision care and that here was something to get my teeth into. By 1988 I had obtained the BOptom and was a professor again. In 1990, together with Dawid J Malan and later Alan Rubin (now Professor), I formed the Optometric Science Research Group (OSRG) with the express objective of building a sound scientific foundation for optics in optometry. I obtained an HonsBSc in Statistics at UNISA in 1996.

Since 1994 the OSRG has produced nine MPhils and two DPhils in optometry. Three DPhils are in the pipeline. The OSRG has been a major factor in establishing a research culture in optometry in South Africa and is recognized as a world leader in the field of quantitative analysis in vision.

I have lectured at universities in Vienna, Paris, Madrid, Oxford, Hong Kong, Philadelphia, Maryland, Massachusetts, Minnesota, Delaware, Arizona, and at international conferences in Santa Fe, Orlando, Boston, San Antonio, Washington, and France. I am on the editorial board of Ophthalmic and Physiological Optics and serve as a reviewer for Optometry and Vision Science, Journal of Cataract and Refractive Surgery, and Journal of the Optical Society of America. My list of publications includes some 200 papers in many peer-reviewed periodicals including Journal of Applied Physics, Journal of Cell Biology, Scientific American, Journal of the Physical Society of Japan, Nature, Protoplasma, Journal of Mechanochemistry and Cell Motility, Materials Science and Engineering, Optical Engineering, and in Optometry and Ophthalmology. I was the recipient of the Optics Prize of the South African Optical Society in 1991 and the J L Saks Award of the South African Optometric Association three times in the 1990s. As Editor of the South African Optometrist I received an award from the Association of Optometric Editors in Dallas in 1991. In 1997 on behalf of the OSRG I received a citation from the American Academy of Optometry for distinguished contributions to visual optics.

In 2001 I became the first person (I believe) in any field of vision to be rated as a researcher by the National Research Foundation; I received an A rating and joined a group of about 40 researchers in all fields in the country. In the same year I was elected as a Fellow of the Royal Society of South Africa. In December 2002 I am to receive the Garland W Clay Award from the American Academy of Optometry in San Diego for the paper in Optometry and Vision Science most widely cited worldwide in the last five years.

Summary of the 2002 Rudolf Marloth Lecture by Prof. Harris: Sight and Insight

How many colours are there in the rainbow? We answer "seven" because our teachers taught us VIBGYOR, and we learned well. But do we observe? Do we see for ourselves? And if we do, and we see seven or something else, does it matter?

How do spectacles and contact lenses really work? For that matter how do the eyes see? A year or two ago I said "At last I know how these things work". But then I've been saying exactly that, every year, ever since I was given the job of lecturing Ophthalmic Optics 15 years ago. And, no doubt, I'll still be saying that for as long as it is my privilege to lecture the subject.

But does it matter? Is it necessary for an academic to strive for insight? In a static world traditional thought and understanding may be adequate. But what of a world of change? The concepts of refractive error and of sphere, cylinder and axis have served optometry well for over a hundred years. But there are now wholly new things, such as spectacle lenses of variable power, refractive surgery, intra-ocular lenses with the ability to accommodate, and other even more exciting things waiting just over the horizon. Can our traditional approaches cope? The answer, in my opinion, is a clear No. They are already proving unequal to the task. Change is not only across time but also across space. South Africa, at the interface between the developed and developing world, has unique challenges and opportunities. If we are going to pass on to our students merely what we learnt, then we are going to be found wanting. New technologies will simply pass us by.

Fundamentally my insight some two years ago was almost naïvely simple: we see because light transfers information about the outside world to the retina. At its simplest light takes the form of rays. Rays are merely lines. A line carries information in precisely two ways: by virtue of its position and its direction,

and nothing else. Each ray delivers to the retina exactly these two pieces of information. From this simple idea we can build a wholly new understanding of sight, spectacles, telescopes, intra-ocular lenses and the optics of ocular surgery. It is an understanding with remarkable clarity, completeness and universality. Vision is a noisy signal and optical devices instruments for enhancing the signal relative to the noise. At last I know how these things work!, for now, anyway.

What are our responsibilities as academics? They are not merely to teach received wisdom, but to do much more. They are for us to strive for insight into what we lecture and to inspire that insight in our students. We need to seek the universals, those things least dependent on our particular context, the invariants under changes in time and space. We do so knowing full well that this is an unending quest. And we must do so without ignoring the particulars of our context. It is a tall order made taller by being understood by too few. Science, including mathematics, is important for what it teaches, of course, but even more so for what it inspires: healthy scepticism, rational explanation, independent thought, careful observation and self-confidence.

It is for this reason that I see the current trend to decrease the scientific content of educational programs in optometry, and I think in other professions, as disturbing. It is the recipe for stagnation and missed opportunities. Too much of our education is VIBGYOR education. And it does matter. For we see seven instead of infinity. And we do not see the infra-red and ultra-violet at all. Science and insight are the antidote. With preparedness to see for ourselves, to think, to embrace the new, to discard the worn-out, to thrill at the rainbow (the real one and not the miserable caricature) we do, indeed, have a chance for real dynamism, for capturing the public imagination and for a much greater contribution to the common good.

The British Association Medal (silver):

Dr Jaco Greeff

Dr Jaco Greeff (right) and Dr Ian Raper, S2A3 President

The British Association Medal (silver) is awarded annually to a scientist under the age of 40 who is actively engaged in research and has, by way of international participation and publications, shown outstanding capability and achievement. Dr Greeff received the award in recognition of his research on the evolution of reproductive strategies.

Jacobus Maree Greeff has been a Senior Lecturer in the Department of Genetics at the University of Pretoria since 1999. He did his undergraduate training at the University of Pretoria, received a BSc(Hons) at Rhodes University, and completed his PhD at the Department of Zoology and Entomology, University of Pretoria, in 1996.

During 1997 and 1998 he was a Post Doctoral Research Associate in the Michiels Research group at the Max-Planck-Institute for Behavioural Physiology in Germany.

Dr Greeff's research focuses on the evolution of reproductive strategies and social behaviour, addressing a number of topics ranging from alternative mating strategies, sex allocation, hermaproditism, and eusociality to sperm competition. He has published 28 papers and gave several invited talks at international conferences and departments. He is a regular reviewer for a number of international journals and has recently joined the editorial board of Ecology Letters.

Dr Greeff received the National Research Foundation's President's award (2000) and the Exceptional Young Researcher Award from the University of Pretoria (2001).

Summary of presentation by Dr Jaco Greeff: Being bisexual

When we look around us, it is clear that humans come in two types, males and females. Nowadays we spend a lot of time denying differences between the sexes, but we forget the profound differences that govern our lives. In animals in general, males are normally

selected to maximize the number of matings they obtain whereas females are more particular about the genetic quality and resources of their mates. This difference probably stems from differing contributions males and females make towards offspring. To illustrate this, imagine how different life would be if males took nine months to mature a huge belly of sperm which they had to transfer to one female. If you find that bewildering, imagine the quandary in which hermaphrodites find themselves: in one animal, both male and female needs have to be satisfied. The question is who gets their way?

In this presentation I discuss this dilemma faced by hermaphrodites, and some of the novel conflicts that may arise from this condition. I hope that this glimpse on life will make you look with fresh eyes, and with new appreciation, at our own condition, that of separate males and females.

Merit certificates

The Association's merit certificates are awarded to persons or institutions who have contributed, each in their own way, to either the advancement of science or the Association's activities. In view of our centenary celebrations, more than the usual number of merit ceriticates were awarded in 2002.

50/50: "The environment cares for you!"

Representatives of the 50/50 team receive a merit certificate from Dr Ian Raper

For the first time in the Association's history a merit certificate was awarded to an entity other than an individual person, namely the production team of the well known television series "50/50". The award recognizes their valuable and sustained contribution to the advancement of knowledge and appreciation of our natural environment. The programme and its producers have already received numerous previous awards. Here are some extracts from a description of the programme:

Our mission:

Our aim is to instil a sense of pride amongst all South Africans for our rich cultural and natural heritage and - where possible - to prevent the destruction of these assets. We are the voice of those not privileged to speak - whether it be plants, animals or people.

Our values:

50/50 is not just about animals and nature. We recognise that humans are also part of nature and therefore have a right to use the environment - but not to abuse it! Hence we chose the title 50/50. It symbolises that there should be a balance between what nature yields and what we can safely consume without damaging the ecosystem. 50/50 is not the mouthpiece for any group or organisation. We do not wish to stop progress, as poverty remains the

most formidable enemy of conservation. However, progress must be sustainable and greedy people who misuse the environment should be called to book.

Some background:

50/50 started in January 1984 as a 26-minute Afrikaans programme on TV1 on Sundays. Because of its popularity across language barriers and viewer's ages, its time was extended a few years later to one hour and it became one of the first bilingual Afrikaans and English programmes on local television. Now in its 18th year it is one of the longest running television shows in South Africa.

The programme was the brainchild of Danie van der Walt and Attie Gerber. It was not easy, in 1983, to convince the SABC management that a regular feature on the environment would work. Nature stories are notoriously expensive undertakings and it is much cheaper to buy nature programmes than to make them. However, these two were adamant that South Africa needed to showcase the work of our own conservationists and scientists who were doing such sterling work.

The show has been effective in furthering the aims of conservation. Many of our stories are about rare and endangered species and the efforts of conservationists and scientists to save them from extinction. Furthermore, 50/50 has raised more than R2 Million for various conservation projects. These funds were used to search for the coelacanth, to protect and expand our knowledge about rhinos, but mostly to purchase land to extend our National Parks.

Dr Johann Carl (John) Vogel

Dr Vogel was awarded a merit certificate for his sustained contributions to the development and application of radiological dating methods. He writes about his life and work as follows:

I was born on 7 September 1932 in Pretoria, a son of the director of the South African Fuel Research Institute, Dr J C Vogel. From 1949 to 1954 I studied at the University of Pretoria. After completing the undergraduate courses in chemistry and physics, as well as in mathematics and applied mathematics, I attended advanced courses in chemistry and physics. I was granted the Bachelor of Science degree in April 1952 and, in April 1955, the degree Master of Science in chemistry.

In 1955 I moved to Heidelberg, Germany, to continue my studies in physics at the Physics Institute of the University under Professor O Haxel. For my doctoral research I constructed a mass spectrometer suitable for the precise measurement of the isotopic composition of light elements. In June 1959 I received my doctorate with the thesis Isotopentrennfaktoren des Kohlenstoffs im Gleichgewichts-system Kohlendioxyd-Bikarbonat-Karbonat. Subsequently I continued work at Heidelberg as research assistant to Professor Haxel until, in late 1961, I succeeded Professor H L de Vries as head of the Radiocarbon dating laboratory in the Physics department of the University of Groningen, Netherlands. In 1962 the activities of this laboratory were expanded to include stable isotope research. In 1967 I was appointed to a personal chair of Isotope Geology at this University.

Later in 1967 I returned to Pretoria to establish the Natural Isotopes Division in the National Physical Research Laboratory of the CSIR. Until 1973 I remained extraordinary professor at the University of Groningen and directed the activities of the Isotope Geology Division at the university.

Until 1997 I was head of the Quaternary Dating Research Unit at the CSIR. In 1986 I was appointed Honorary Research Associate of the Palaeo-anthropology Group at the University of the Witwatersrand, and in 1988 I was elected a fellow of the Royal Society of South Africa. I am an horourary member of the Southern Africa Association of Archaeologists, the South African Society for Quaternary Research and, since 2000, of the International Union for Quarernary Research."

Dr Vogel has published some 225 papers in scientific journals and conference proceedings, and has contributed to international conferences in 20 countries since 1959. He has served on a number of national and international scientific committees and has received several awards for his scientific work. The University of Cape Town conferred an honorary Doctor of Science degree on him in 1998.

Dr John Vogel

Professor P D Tyson

Prof P D Tyson

Prof Tyson received a merit certificate for his numerous research contributions to meteorology and climatology in southern Africa.

He obtained the PhD degree at the University of the Witwatersrand and has held various senior positions at that university for the past 35 years:

Professor, from 1969

Head, Department of Geography and Environmental Studies, 1969-1978, 1986-1987

Dean, Faculty of Science, 1975-1978

Director, Climatology Research Group, from 1977

Vice-Principal, 1988-1992

Deputy Vice-Chancellor, 1981-1984, 1987-1993

He was evaluated by the Foundation for Research Development in the top category of South African scientists and as a world leader in the field of climatology from 1985 to his retirement in 2002. His research has led to numerous publications, including 168 contributions to national and international scientific journals and books. He is also the author of several books on the climatology of southern Africa:

Climatic change and variability in southern Africa. Oxford University Press, 1986.

The atmosphere and weather of southern Africa. Oxford University Press, 1988.

The weather and climate of southern Africa. Oxford University Press, 2000.

Regional-global linkages in the earth system. Springer Verlag, 2002.

Prof. Tyson has chaired several national and international scientific committees, and was a member of several more:

Chairman, IGBP/WCRP/IHDP START Scientific Steering Committee, 1996-2001

Chairman, FRD National Astronomy Facilities Board, 1990-1999

Chairman, South African National Committee for the IGBP, 1987-1992

Chairman, South African National Committee for the IGU, 1988-1994

Vice-Chairman, Water Research Commission, 1995-1998

He has been a visiting scholar at the University of Birmingham (1966), University of Virginia (1972, 1994), California State University at Northbridge (1973), and the University of Canterbury (1979, 1996), and a guest lecturer at universities in the United Kingdom, United States, Switzerland, Sweden, Germany, Canada, Australia, and New Zealand. Joint research projects were undertaken with nine academic institutions and research establishements in Europe and the United States.

Prof Tyson is a fellow of the Royal Society of South Africa and of the South African Geographical Society, and a founder member of the Academy of Science of South Africa. He received the Claude Leon Harris Foundation Annual Award for pioneering work in climatology in southern Africa in 1990, and was recognised as a Distinguished Researcher by the University of the Witwatersrand in 1995. The University of Pretoria awarded him an honorary Doctor of Science degree in 2002.

Dr C K (Bob) Brain

Dr Brain received a merit certificate in recognition of his many important contributions to zoology and palaeontology, and in particular for his recent studies of the earliest animal fossils to be found in Namibian sediments. He was the recipient of the South Africa Medal (gold) in 1997.

Charles Kimberlin Brain was born in Harare, Zimbabwe, in 1931. He obtained a Bsc degree in Zoology and Geology at the University of Cape Town in 1950. Five years later he married Laura Kraan. She and their four children have all participated enthusiastically in his various natural history projects.

His PhD research at the University of Cape Town led to a thesis on "The ape-man-bearing cave deposits of the Transvaal" in 1957. This was followed by a DSc degree awarded by the University of the Witwatersrand on the basis of published work in which he pioneered the new discipline of African cave taphonomy. Since then he has been awarded honorary DSc degrees by the Universities of Cape Town (1991), Natal (1993), Pretoria (1999), and the Witwatersrand (1999).

Dr Brain has spent most of his career in museums, particularly the Transvaal Museum, where he was Director from 1968 to 1991. He has received many awards, and has been elected a fellow of the Royal Society of South Africa, the Zoological Society of London, and the Museums Association of Southern Africa. He has served as President of seven professional societies, has been an A-rated researcher by the Foundation for Research Development since 1984, and has participated in 31 international scientific conferences in various parts of the world.

Dr Bob Brain, opening the proceedings

His research career has spanned five decades and led to numerous publications. In the early nineteen-fifties he conducted the first systematic investigation of the stratigraphy of hominid-bearing cave deposits in the Transvaal. From 1957 to 1960, as Curator of Lower Vertebrates and Invertebrates at the Transvaal Museum, he demonstrated that species-specific behaviour patterns in reptiles could be used as taxonomic criteria in the same way that morphological features were. As Keeper of Zoology at the newly established Queen Victoria Museum in Harare he undertook a pioneering comparative behavioural study on two species of Cercopithecus monkeys, showing up important behavioural adaptations required for coping with predation. Returning to the Transvaal Museum in 1965 he started a further investigation of the Swartkrans Cave, which continued for 25 years. The period included wide-ranging field and laboratory studies which led to the new discipline of African cave taphonomy. This discipline allows reliable reconstructions to be made of early hominid and other animal behaviour, and of past environments. The taphonomic theme was developed in numerous publications and in the book The Hunters or the Hunted? An Introduction to African Cave Taphonomy.

Dr Brain was much impressed with the role of predation as a mediator in the evolution of sense organs and intelligence in both prey and predators. He therefore started to trace the roots of predation back to the beginnings of animal life by searching for microfossils in sediments that predate the main Cambrian radiation of animal life. In recent years the search has focussed on Late Proterozoic limestones of the Nama Basin in Namibia.

Prof Will Alexander

Prof Alexander received a merit certificate as a member of the Association for 55 years, during which time he was actively involved in the advancement of civil engineering in South Africa through the planning and construction of water schemes, research and teaching.

Will Alexander joined the South African Association for the Advancement of Science in 1947 when he was a civil engineering student at the University of the Witwatersrand. After graduation he joined the Department of Irrigation (now Water Affairs) and spent the first twenty years of his career in the field constructing large dams and water supply projects, including the 80 km long tunnel connecting the Orange and Great Fish River systems.

On his return to Pretoria in 1970 he was appointed Manager of Scientific Services and in that capacity supervised all the research acitivities in the Department and chaired or served on a number of research coordinating bodies. He was responsible for the collection, processing, interpretation and publication of routinely measured data including river flow, rainfall, open water surface evaporation, sediment transport, and water quality.

In 1985 Will accepted an appointment as professor in the Department of Civil Engineering at the University of Pretoria. During the following years more than 500 civil engineering students passed through his hands. In 1996 he was appointed a member of the United Nations Scientific and Technical Committee on natural disasters. He is still very active in the field of water resource development and flood studies, and has written a handbook on southern African flood hydrology (1990), a book on flood risk reduction measures (1993), and over 100 reports and articles.

Prof Alexander described aspects of his career relating to the fulfulment of the Association's objetives in the recently published centenary edition of the Marloth Brochure.

Prof Will Alexander

Dr Phil C Minnaar

Dr Minnaar was awarded a Merit Certificate for his contributions to the Association as a member of Council, Chairman of the Pretoria Branch, and Editor of the Marloth Brochure. The award was made in May 2002, just before he emigrated to Canada..

Philippus Christiaan Minnaar was born on 2 May 1940. He obtained a Bsc degree in Mathematics and Applied Mathematics at the University of Pretoria in 1961 and worked as a computer programmer for many years, first at International Computers Ltd, and then at the University of South Africa (Unisa). He completed a Bsc (Hons) degree in Computer Science at Unisa in 1975.

In 1984 Dr Minnaar was promoted to Director level and requested to establish a Bureau for Management Information at Unisa - the first such department at a South African university. His brief was not only to collect, process and disseminate management information, but to conduct institutional research over the whole spectrum of students, personnel, finance and physical facilities, and participate in strategic planning. The Bureau had a staff of 18 and he was later promoted to Chief Director.

Dr Phil Minnaar and his wife Adeline

In 1991 he was awarded the degree MSc in Information Systems by Unisa for a thesis on Computer aided decision making in a distance education university. For his subsequent doctoral research he developed a computer system which leads academic departments at universities through a process of self-evaluation for quality assurance. His thesis, A knowledge based system for quality assurance support in a university, earned him a PhD in Computer Science at the University of Pretoria in 1998.

Meanwhile Dr Minnaar had taken early retirement in 1995, feeling that he needed new challenges. Since then he has achieved great success in doing consulting work on management information, institutional research and quality assurance. His clients include many universities, technikons, and other institutions dealing with tertiary education in South Africa.

Dr Minnaar has been active in many scientific, professional, and cultural societies, including some in Canada. He has addressed or chaired 16 overseas conferences, undertaken several study tours abroad, published several papers, and co-authored a book on Teaching science. He was News Editor of Archimedes, a science magazine for high school pupils, for 27 years. Further interests and activities include the Africana Historical Society (Chairman), the Dynamic Toastmasters Club (President), freelance journalism, the publication of three short stories, and collecting antiquarian books.

Prof G C van Drimmelen

Prof Govert van Drimmelen

Prof van Drimmelen was awarded a merit certificate for his outstanding services to the Association. He was its President in 1963/4 and is still an active member of Council. He was awarded the South Africa Medal (gold) in 1965. His life and work were described in the 2002 centenary edition of the Marloth Brochure. What follows is a brief summary:

Govert Cornelis van Drimmelen was born in Zeerust in 1911. He qualified as a veterinary surgeon (BVSc) at the University of Pretoria in 1933. Later that same year he was appointed as Government Veterinary Officer and was stationed at the Allerton Laboratories in Pietermaritzburg. Subsequently he served in the Transkei, Ermelo and Bloemfontein, combatting various stock diseases, and lectured at Glen Agricultural College. He submitted his doctoral thesis on artificial insemination in 1947.

In 1946 he was transferred to a research Post at Onderstepoort and lectured in Bacteriology and Mycology. In 1952 the World Health Organization appointed him as representative for Brucellosis in Africa south of the Sahara. After a WHO meeting in Florence, he spent six months on a study tour to London, Rotterdam, Hilversum, Paris, Copenhagen, and Hamburg.

He was appointed Professor of Bacteriological and Mycobiological diseases in 1958, and in 1962 was also promoted to Senior Research Officer in charge of the Bacteriological Section of the Onderstepoort Veterinary Laboratories. During the next few years he made a series of breakthroughs in Brucella vaccine research. This work and his research on various diseases in animals resulted in 150 scientific and some 90 popular publications.

In 1966 Prof van Drimmelen was appointed Agricultural Councillor (Scientific) to the South African Embassy in Washington D.C. In 1968 he was decorated with the Medal for Pathological Excellence by the Pathology Section of the US Armed Forces. The next year he received the Senior Captain Scott Medal of the Biological Society of South Africa.

After his return to South Africa in 1972 he was appointed Director of Diagnostic Services at Onderstepoort. He retired in 1975.

S_2A_3 Bronze Medals awarded during 2002

The Association's Bronze Medals serve to commend outstanding South African science students graduating at the masters level in a particular year. One candidate may be nominated by each South African university and technikon. During 2002 medals were awarded to the following studens:

University of Cape Town (2001): Ms Mairi Kilkenny, MSc Chemistry: Structures and thermal analyses of Werner clathrates and co-ordination polymers.

University of Cape Town (2002): Ms Justine Heather Tinker, MSc Geological Sciences: Stratigraphic and structural interpretation of seismic reflection data across selected sections of the Kaapvaal Craton.

University of Stellenbosch: Mr Rodney Gordon Urban, MSc Electronic Engineering: Modelling corona noise on high-voltage transmission lines.

Potchefstroom University: Mrs Juanita Peacock, MSc Botany: Role of boundary layer resistance and wall ultrastructure in determining differential drought tolerance in tobacco.

Port Elizabeth Technikon: Miss Petra Hoffmann, MTech Chemistry: The development and evaluation of procedures for the synthesis of phenolic ethers by Baeyer-Villiger oxidation.

Rand Afrikaans University: Hillel Louis Zidel, MComm Economics: Inflation targeting: An unrecognised dilemma for South Africa.

Technikon Natal: Mrs Usha Govinden, MTech Biotechnology: Purification and characterisation of the AmpC ß-lactamase from a South African Klebsiella pneumoniae isolate.

Technikon Free State: Jacobus Gert van der Walt, MTech Mechanical Engineering: Development of a numerically controlled, radial milling machine for use in radio therapy.

Rhodes University: Miss Tracey Pamela Fairweather, MSc Fisheries Science: An analysis of the trawl and longline fisheries for Merluccius capensis off the West Coast

Medunsa: Mrs M C de Beer, MSc (Med) Virology: Molecular and serological characterization of a caprine rotavirus.

University of the Witwatersrand: Mr David Dago N'Da, MSc Chemistry: Synthesis of polymeric iron and platinum compounds for anticancer activity screening.

Technikon Pretoria: Ms Ntebogeng Sharon Mokgalaka, MTech Chemistry: Improved method for the analysis of the Platinum Group Metals.

University of Port Elizabeth: Ms Constance H Dixie, MSc Computer Science: The development of a framework for outcomes-based introductory technology.

University of Pretoria: Ms Irene Barnes, MSc Microbiology: Taxonomy, phylogeny and population biology of Ceratocystis species with particular reference to Ceratocytis fimbriata.

University of Durban-Westville: Ms Leila Ramsaroop, MMed Anatomy: An anatomical investigation of the sympathetic outflow to the upper limb.

University of Natal, Durban Campus: Mr Telex M N Ngatched, MSc Engineering: Performance of turbo coded DS-CDMA systems in fading and burst channels.

University of Natal, Pietermaritzburg Campus: Ms Sarah Rosalind Pryke, MSc: Sexual selection of multiple ornaments in the red-collared Widowbird [Euplectes ardens].

Extracts from the annual report by the President, Dr Ian Raper

I am honoured to report to the council and members on the activities of the Association during 2002 . In addition, in this centenary year some comment is appropriate on our first 100 years and, modestly, to indicate our objectives for the future. Our centenary in the year of the World Summit on Sustainable Development prompts consideration of a broader context of local and international processes. It has clearly at all times been the wish of our leaders and members that the Association should be related and relevant to real needs within prevailing circumstances.

"It is science alone that can solve the problems of hunger and poverty, of insanitation and illiteracy, of superstition and deadening custom and tradition, of vast resources running to waste, or a rich country inhabited by starving people Who indeed could afford to ignore science today? At every turn we have to seek its aid The future belongs to science and those who make friends with science."

These words, spoken by Jawaharlal Nehru in 1962, indicate very powerfully the responsibility carried by intellectual leaders of the world. The problems listed are, 40 years on, at the very least as dire as they were then; some have escalated beyond recognition. Hunger and poverty are particularly on our minds at a time of famine and drought in southern Africa, where aid from abroad means the difference between life and death for many millions. Aspects of insanitation and illiteracy have been addressed successfully; although there is a long way to go, at least these needs have been recognised and are receiving attention in our own country. The questions of superstition and of deadening custom and tradition are still largely to be dealt with on most continents, and occasion conflicts causing great suffering and enormous refugee problems, even genocide. Too often this is endemic to regions with vast resources that are being allowed to run to waste, and to countries, rich in (for example) minerals, that are nonetheless inhabited by starving and suppressed people.

Although we cannot begin to contemplate the possible reach of science in the next century and beyond, we can certainly determine to be increasingly pro-active in our Association. We owe it to our predecessors, and even more to subsequent generations, to promote a healthier environment, safer technology and inspired leaders. We must try to picture what levels of nation-building in South Africa, development on the continent and international peace and prosperity can be reached if we continue our heritage-related activities and increasingly play our part in the growth of science in South Africa towards truly sustainable development.

[After briefly reviewing the history of the Association since its foundation in 1902 some recent activities are noted]. In 1980 the Association was one of the initiators of EXPO, marking our ongoing concern that young people be encouraged to pursue scientific careers. Since 1981 the Bronze Medal has been awarded annually to the best student at masters level in the sciences at each of the South African universities, extended in 1998 to include technikon students.

In 1984 a trust fund was received, from the estate of Rudolph Marloth, to sponsor the annual Marloth

Commemorative Lecture and the Marloth Brochure. The publication has since appeared annually, carrying details of awards made during that year and publishing the acceptance lectures of the Gold and Silver medallists. In 1992 the Craib Trust was the result of a bequest. Interest from the trust is made available for mammal research. In 2001the Biographical database of southern African science was initiated by Cornelis Plug, a member of council, to coincide with the centennial celebrations in 2002. Another centenary project initiated by the council is to enlist private firms, in the new category of corporate membership, to drive environmental rehabilitation through regional heritage associations. Some businesses in the hospitality and tourism industry have already been given membership certificates in recognition of their responsibility towards the environment. Monthly public lectures held by the Pretoria branch at the Transvaal Museum testify to the active nature of this branch. We are currently developing our website to provide a repository of significant achievements and an interactive platform for disseminating information.

Activities during 2002

The Association's Bronze Medals were awarded by 17 South African universities and technikons. Details appear elsewhere in this brochure. These medals target the youth who have already progressed considerably along the scientific career path. They support the concept of recognition for research achievement, also evident in the annual awards of the South Africa Medal (gold) and British Association Medal (silver). By recognising the recipients of these medals publicly, we create positive role models for students still at school or involved in undergraduate study. For this reason an award must be seen not only as a tribute to the achievement of an individual, but as a visible incentive. We urge universities and technikons once again to incorporate the award of the Bronze Medal into a convocation graduation ceremony with the greatest number of senior academics and students in the relevant disciplines present.

The current S_2A_3 membership stands at 108, and, since August 2002, the exciting addition of two corporate members. [Details of members who passed away during 2002 are given elsewhere in this brochure].

We are grateful to the committee of the Pretoria Branch for organizing a number of interesting lectures during 2002 [see separate report]. Attendance has been good at all lectures.

It is my pleasure to offer the council's, and my personal, thanks to the following:

- Members of council and of the Pretoria Branch committee for all their work during 2002, and specifically for their efforts in organizing the AGM and the medals ceremony.
- Dr Gerard von Gruenewaldt for his meticulous assessment of the nominations received for the 2002 South Africa (gold) and British Association (silver) Medal Awards.
- The Marloth Trust for financing the Centenary and Annual Awards Ceremony; the 2002 Marloth Brochure; and the centenary edition of the Marloth Brochure.
- Members who contributed to the centenary edition of the Marloth Brochure, and all those who were involved in its preparation.
- Dr Bob Brain for opening the centenary awards.

Lectures organised by the Pretoria Branch during 2002

4 March 2002:	The pebble bed modular reactor: Safe nuclear source of sustainable energy - oxymoron or achievable goal? by Eben J Mulder, Chief Scientific Officer, PBMR (Pty) Ltd.
8 April 2002:	The biological behaviour of HIV, by Dr Lynne Webber, Medical Faculty, University of Pretoria.
6 May 2002:	Can artificial be intelligent? by Dr Etienne Barnard, Molo Afrika Speech Technologies.
3 June 2002:	Prospect for a sustainable South Africa? by Prof Albert van Jaarsveld, Director: Centre for Environmental Sudies, Department of Zoology and Entomology, University of Pretoria.
5 August 2002:	Indigenous knowledge systems: Monitoring and sustainability of mopane worm crop harvesting, by Dr Rob Toms, Transvaal Museum.
2 September 2002:	Solar Eclipse 2002, by Prof Derck Smits, Departent of Mathematics, Applied Mathematics and Astronomy, University of South Africa.
7 October 2002:	Prime numbers, atoms and space-time structure of the universe, by Prof Jan Boeyens, Department of Chemistry, University of Pretoria.

S_2A_3 National Council, 2002

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Prof Govert van Drimmelen

S_2A_3 remembers

The following members of the Association passed away during 2002.
We offer our condolences to their families.

Dr Clem Abbott, life member.

Mrs Marianne Auret, in July 2002.

Mr P H Crawford on 9 September 2002.

Dr R J A Jordan, life member.

Mr J M Lawless, life member, on 23 December 2002.

Prof Friedel Sellschop, past President and member of Council, on 4 August 2002.

Corporate membership

In 2001 the Council of S2A3 decided to institute a new category of membership, to give recognition to business concerns who demonstrate a willingness to undertake environmental conservation and enhancement practices. Two corporate members were enrolled by December 2002:

Sparkling Waters Hotel, Rustenburg
Qualitour.

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