



# RUDOLF MARLOTH

## Brochure ~ Brosjure

**Southern African Association for the Advancement  
of Science**

**Suider-Afrikaanse Genootskap vir die Bevordering  
van die Wetenskap**

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### **PRESIDENT'S REPORT 99/2000**

I would like to thank the members, and especially Council members, of the Association for their contributions, all unpaid, time-consuming, efforts and enthusiasm. Our national secretary, Mrs Shirley Korsman, deserves particular thanks, as even in a year during which her health was not of the best, she continued to perform in her customary unique and magnificent fashion.

Mr Hermann Ortner received a merit certificate for his excellence as national treasurer. Thanks are also due to the National Research Foundation, and especially Dr G von Gruenewaldt, for his highly valuable assessment of candidates for the Council's choice of Gold and Silver award winners.

As usual, we congratulate the Pretoria Branch for its activity, thirteen well-attended public lectures over the two-year period and the newsletter.

We congratulate the medal winners for providing society at large, and especially the youth, with exemplary role models in the fields of science. Repeatedly we have been additionally inspired by their humility and humanity, commitment to education. Theirs are often lonely, always arduous endeavours during a lifetime dedicated to research. Winners are frequently eminent members of faculties who have received honours from other distinguished societies, national and international. At times, this Association has had the privilege also to pay tribute to scientists who have gone unnoticed while engaged in highly important work in remote areas, in unfavourable conditions and often at great risk to their health and safety. These ceremonies are occasions of salute to all of them; indeed also to nominees who did not receive awards this time around. There are again truly impressive scientists on the shortlist.



*Dr Ian Raper, President of S<sub>2</sub>A<sub>3</sub> and  
Mrs Shirley Korsman, secretary of S<sub>2</sub>A<sub>3</sub>.*

We gratefully acknowledge the Marloth Trust which finances the annual awards ceremony and the publication of the Marloth Brochure.

Together we extend our sincerest condolences to those close to Dr C G Crocker, a Life Member of our Association

Membership is increasing in the sense that we gain more new members than we lose: in the past year we gained 26 and lost 15.

Bronze medals for best Masters students were awarded at the following universities: University of Pretoria (1999 & 2000), Durban-Westville, Stellenbosch, Potchefstroom, Rand Afrikaans, the Witwatersrand, Natal (Durban and Pietermaritzburg campuses), Port Elizabeth. Technikon Pretoria also awarded our bronze medal to its best student in the sciences.

As our Association is historically the original and source society in the country, from which others have sprung, it is appropriate on this occasion to express our concern for the future of such other societies, and the research journals for which they are responsible.

Government in the form of the Department of Arts, Culture, Science and Technology, provides funding, through the NRF and the HSRC, for the actual performance of research. The taxpayer should, I think, feel quite satisfied with this investment.

Publication of research is unfunded, however, other than those publications, which are produced by state agencies. Unpublished research is of course like Pavarotti singing in the shower. It does not allow the essential debate and critical surveillance of research methods and findings afforded by the circulation of journals. Societies are facing total withdrawal of the few subsidies that existed, while presidents of societies report that their members are increasingly unable to pay membership fees.

The demise of many refereed serials in this country, many with long histories and crucial functions within their fields, is imminent. Proposals will be made to government during the coming year for some funds to be paid to societies which publish journals. It would also seem to be a very positive step for aid agencies and commercial and industrial concerns to consider assisting such societies. If one neglects to help the best, the worst inevitably become worse.

Dr Ian Raper  
November 2000

### **S2A3 COUNCIL MEMBERS FOR 2000/2001**

Dr Ian Raper	President
Mrs Shirley Korsman	Secretary
Mr Hermann Ortner	Treasurer
Mrs Esme den Dulk	Verteenwoordiger, Pretoria-tak Nuusbrief en Skakelwerk
Mnr Eugen Hanau	Verteenwoordiger, Pretoria-tak
Dr Glyn Jones	Newsletter
Dr Freek Kok	Verteenwoordiger, Pretoria-tak
Dr Frans Korb	Vice-President, Witwatersrand Chairman: Medals Committee
Dr Phil Minnaar	Chairman, Pretoria Branch Editor, Marloth Brochure Deputy Chairman, Medals (Technikons)

Prof Govert van Drimmelen	Oud-President (1964), (Ere-lid)
Prof Michael Wingfield	
Prof W Ellery	Vice-President: Kwazulu-Natal
Mr Case Rijdsdijk	Vice-President: Western Cape
Prof BL Robertson	Vice-President: Eastern Cape
Prof JPF Sellschop	Past President (1972)
Prof P Smit	Oud-President (1990/1991)
Prof Johann Wolfaardt	Oud-President (1991 – 1996)

## **ANNUAL MEDAL AWARD CEREMONY 1 November 1999**

### **SOUTH AFRICA MEDAL (GOLD) 1999 RECIPIENT: PROFESSOR PETER EIDDON CLEATON-JONES**

Professor Peter Eiddon Cleaton-Jones is the Director of the Dental Research Institute of the University of the Witwatersrand. He is regarded as the premier dental scientist in South Africa. He has an international reputation for his research into the epidemiology of dental caries in children and the biocompatibility of dental materials. As an example, he was the only invited co-author from Africa out of 5 non-Americans from a total of 36 co-authors for the 5<sup>th</sup> edition of the standard textbook on primary preventive dentistry.

Professor Cleaton-Jones is regarded as the premier dental scientist in South Africa. Recent invitations from overseas to use these qualities are:

- guest-of-honour of the Israeli Division of the International Association for Dental Research, Jerusalem, June 1999;
- a keynote speaker at the International Paediatric Dentistry Conference in London, UK, September 1999
- a keynote speaker at the Congress of the Commonwealth Dental Association and Indian Dental Association, Delhi, India, January 2000.

He has a particular reputation for training young scientists. As an example, in June 1999 he has been invited to present a training course for young scientists at the Hebrew University of Jerusalem.

A third reputation is in the field of ethics of medical research. He chairs the Ethics Committees of both the Medical Research Council and the University of the Witwatersrand. In 1998 he was invited to Portugal by the Council of Europe to advise on research ethics in developing countries.

He is Assistant Dean (Research) in the Faculty of Health Sciences.

As Director of a Medical Research Council [MRC] research unit he has the MRC equivalent of an FRD 'A' rating.

Professor Cleaton-Jones has received the following scientific awards:

- Colgate Palmolive Prize for the best scientific paper presented by a member under the age of 35 years at the annual scientific congress of the South African Division of the International Association for Dental Research 1969.
- H Trendley Dean Memorial Award of the International Association for Dental Research 1998 for distinguished research into the epidemiology of dental caries.
- Wellcome Trust Collaborative Research Initiative for 1998-2001 with Prof M Curzon, Leeds Dental Institute, UK
- Elida-Gibbs Research Fellow 1969
- British Council Visitor to University of Bristol Dental School 1972
- Silver Medal of the South African Medical Research Council 1990
- Distinguished Researcher Award of the University of the Witwatersrand 1995
- Nominated for Vice-President, International Association for Dental Research 1996.
- 75th Jubilee Medal, Faculty of Health Sciences, University of the Witwatersrand 1997



He is involved in the following scientific committees / organizations:

**Local:**

- South African Division of the International Association for Dental Research 1969-1980 (Secretary 1974-1976, President-elect 1975, President 1977-1980)
- Committee on Preventive Dentistry, Dental Association of South Africa 1974-1980
- Medical Research Council, Board Member 1978-1981, 1984-1987
- Research Productivity Awards Committee 1987-1994
- Ethical Screening Committee 1987-present
- Committee for the Co-ordination of Oral Epidemiology Studies 1981-1986
- Oral and Dental Research Thrust Convenor 1995-present
- Convenor for 4<sup>th</sup> edition of the MRC Guidelines on Ethics for Medical Research 1999-
- Multiple research committees at the University of the Witwatersrand

**International:**

- International Standards Organisation, Working Group on Pulpal Responses to Dental Materials 1991-present
- International Association for Dental Research, Distinguished Scientists Awards Committee, as well as the Nominating Committee 1999-2001

He has been a keynote speaker for 87 presentations and has made a total of 230 presentations at local and international conferences. He has published 1 book, 5 chapters in books and 28 scientific papers as sole author, 43 scientific papers as first author and 193 scientific papers as co-author. He also published 2 book chapters as co-author.

Professor Cleaton-Jones has also been involved in the popularization of science through the following radio broadcasting:

"Radio Doctor" occasional dental topics 1974-1975

"Voice of Science" occasional dental topics 1974-1975

"Medical File" regular weekly panel discussion (Chairman plus three experts)

**A BRIEF SUMMARY OF THE RUDOLF  
MARLOTH MEMORIAL LECTURE - 1999**

**MENTORING, MOTIVATING AND  
MANAGING THE NEW RESEARCHER**

by  
**Prof Peter Cleaton-Jones**

Mr President and members of S2A3, a thousand thanks for honouring me with the South Africa Medal (Gold). In doing so you honour too my family and so many colleagues, the University of the Witwatersrand and the Medical Research Council.

Why I chose this subject is surely a question at least some of the audience must be asking. The reason is based in my past. I started in dental research 30 years ago when new researchers in that field were self-taught. I have never forgotten the culture shock that I experienced going to overseas research institutions for the first time to see that there was a more effective way of learning to do research. My PhD was twice as long as it needed to be and I took twice as long to complete it as I needed to.

So, my talk tonight will deal with advancing the new researcher, which fits in well with the S2A3 ideals of the advancement of science. Let me start with considering a mentor, a person that all new researchers should have, defined by the Concise Oxford Dictionary as an experienced and trusted advisor. Mentors are special people. They usually have status but certainly lead, like an Israeli army officer, from the front by being active researchers. They are people who shape research characters and should leave behind in those they have advised what Walter Lippman has termed "the conviction and will to carry on".

How do such mentors motivate a new researcher? In times past it was sufficient to appeal to patriotic or altruistic motives but society today is more material. A wise mentor will assess the reasons why each person has entered research - for career, curiosity, fame or fortune [although the latter is unlikely]. Whatever the reason, a mentor is there to provide encouragement, insight and moral support. Techniques will vary from mentor to mentor; for me doses of praise given at appropriate moments have worked best. A critical aspect for mentors to consider is a need to keep the new researcher in South Africa, which I believe is a balance of individual recognition, a career structure and adequate remuneration.

South Africa has been classed as a developing country, and at present, there is a need to increase the numbers of previously disadvantaged people in research. This is no easy task because compared to developed countries we do not have the same established academic culture, funding sources are fewer, our new researchers are more naïve and technology is simpler. Coupled to this, fortunately, is greater flexibility of organisation than elsewhere.

I work in biomedical research and see stark contrast between natural scientists with a PhD from my university and a medical graduate at clinical specialist level also with a PhD. The natural scientist will have taken about 9 years to reach PhD status and along the way will have had formal training in research methods during a basic degree, an honours year, a masters degree and during the doctorate research too. The typical medical PhD will have taken about 16 years to achieve a clinical speciality and a PhD but will not have had formal research training unless it was voluntary. This is where mentors have a vital role to play in providing formal or informal training.

There are four phases in a postgraduate student's life when mentors must be astute managers. In the planning phase a mentor must not only advise on project selection and design but must also assess if a potential student is equal to the task; if not it is better not to begin. During the second phase the mentor's role is to encourage research momentum, but in today's world must also ensure that the data may be trusted because research misconduct is increasing. The third phase is one in which great patience is necessary as a student wrestles with data analysis and the writing of a thesis. The final phase is that between submission of a thesis to examiners and having the thesis approved. Mood swings are common in students and worsen the longer one has to wait.

For mentors the achieving of a higher degree by a student is a time of great satisfaction which is frequently tempered by the frustration of losing now valuable people to overseas or to commerce because of poor salaries and career prospects in South African research.

In my career I have supervised some 75 postgraduate student theses and have given, together with colleagues, over 1000 students basic training in research - what has this taught me?

Well, here are my "secrets" encourage the new researcher to walk, not run, with well-timed praise and honesty; give a short, sharp, basic training in research

methods, attach to a good team with a clear leader to complete at least one project, only then get overseas experience [more is gained through having some insight into the research process]. Then, the properties most vital to impart are scientific honesty and stubbornness to follow a project to a conclusion.

**BRITISH ASSOCIATION MEDAL  
(SILVER): 1999**

**RECIPIENT 1999 –**

**PROFESSOR STEVEN LOUDON CHOWN**

Professor Steven Loudon Chown matriculated in 1981 with Academic Honours at Christian Brothers College in Pretoria. He obtained a B.Sc. (Entomology and Zoology), *cum laude* in 1985 and a BSc Hons (Entomology), *cum laude in 1986*, both from the University of Pretoria. He registered for M.Sc. in Entomology at the University of Pretoria in 1986, but the M.Sc. was upgraded to a Ph.D in 1989 and the Ph.D. was awarded in December 1989.

The topic of his thesis was "Ecology and Systematics of the Ectemnorhinini (Coleoptera Curculionidae: Entiminae)

From 1983 to 1984 he was Assistant Biologist on the Marion Island Entomological Programme, with six months field experience in the sub-Antarctic. From 1986 to 1989 he was full-time Biologist on the Marion Island Entomological Programme. The title of the project was: Ecology and Systematics

of Sub-Antarctic Curculionidae. During this period he had twenty-two months field experience on Marion Island.

He was appointed as a lecturer in the Department of Entomology of the University of Pretoria in 1989 and is currently a Full Professor

Professor Chown's research interests span a broad range of topics. This stems from the fact that, in his opinion, an understanding of the processes underlying global patterns in the distribution of insects and other groups can only be achieved by an integration of systematics, biogeography, ecology and physiology. Given that the conservation of diversity is a global priority, understanding the distribution of this diversity must undoubtedly be one of biology's most pressing goals. According to Professor Chown, physiological tolerances, ecological interactions, and historical events all contribute, in varying degrees depending on the taxon and scale of study, to the distribution of organisms. Hence, if diversity is to be understood these aspects of the biology of all organisms must be integrated. Currently this forms Professor Chown's major research interest. Thus he is engaged in biogeographic and macroecological studies, systematics and the physiological ecology of insects and other taxa.

He has published 79 articles in scientific journals, 9 peer-reviewed contributions to books and various popular articles. He has delivered 60 papers at national and international conferences.

Professor Chown also received the Young Research Award of the Faculty of Science, University of Pretoria, the Commonwealth Staff development Fellowship for study in the United Kingdom and the BP South African Antarctic Medal.



**SUMMARY OF RUDOLPH MARLOTH LECTURE  
SPECIES DISTRIBUTION AND THEIR IMPLICATIONS**

by  
**S L Chown**

Mr. President, ladies and gentlemen, it is indeed an honour to have been selected by the S<sub>2</sub>A<sub>3</sub> Council as this year's recipient of the British Association Medal, and one for which I am grateful. Of course, such an award is always made possible by the assistance and support of friends and colleagues. In this regard I would especially like to mention Melodie McGeoch, Jan Crafford, Clarke Scholtz, Kevin Gaston, Albert Van Jaarsveld, Niek Gremmen, Brian Williams, my graduate students, and my family. This evening I thought that I would share with you some ideas on species distributional patterns. It is a theme that has characterized much of my research, albeit one which is well-disguised in places.

Perhaps one of the patterns recognised most commonly by ecologists is that biological diversity is not uniformly distributed across the surface of the planet. Indeed, the tropics seem to have many more species than any other area of the planet, although there are some pronounced and interesting exceptions, especially in the sea. The most obvious question emerging from these patterns is whether there is any common explanation for them. The glib answer is, of course, yes. However, the issues go well beyond an unqualified yes, and indeed some of the most obvious patterns in climate may provide a common theme that has not been well explored.

As many of you will know, much of my work has focused on southern oceanic islands. Perhaps one of the most astonishing things that struck me, while travelling across the Indian Ocean for seven days, is that the southern hemisphere is largely covered by water. The difference between the two hemispheres is really quite dramatic, especially from a Polar view. This might strike many of you as prosaic. Its implications are, however, quite dramatic. As a consequence of the vast southern ocean, the southern hemisphere is, if we think in terms of temperature only, a far less variable place than the north. Temperature variation across the New World demonstrates the point nicely. Most areas can have higher summer temperatures, even within the Arctic and Antarctic regions. On the contrary, winter temperatures are high in the tropics, reasonably low in the high southern latitudes, and very low in the high Arctic. Amazingly, insect temperature tolerances vary in a similar fashion. Upper lethal limits show little variation across the planet, while lower lethal limits are lowest in the Arctic, increase through the tropics, and decline again towards the Antarctic, but never to the extent found in the Arctic. These findings have considerable implications for a variety of laws proposed in large scale ecology, but that have, with the exception of some of our work, not been well tested.

Studies of southern ocean island biotas allow a somewhat different perspective on the problems of species distributions. Together with colleagues from the UK and the Netherlands, I have shown that glaciation may not be quite so important in determining indigenous species richness on these islands as was previously imagined. Rather, and perhaps unsurprisingly, island area and isolation relative to potential source areas for colonists are generally important correlates for species richness, although temperature has a large role to play too. Colder islands have fewer species. In our analyses we were also careful to separate those species indigenous to the islands from those alien species that have recently colonised with the assistance of humans. What really fascinated us was that in most cases alien species richness could be most readily explained by the number of people who have visited the islands. This is worrisome, especially because many alien species have tremendous effects on the local biota. Our findings are particularly concerning because ecotourism is growing apace in the southern ocean. Ecotourists generally want to visit as many islands in succession as possible, mostly going ashore for a few hours at best and then moving on, i.e., sound bite tourism. In consequence they constitute perhaps the most direct avenue for alien introductions that has yet been available in the southern ocean. Thus in our opinion, for southern ocean islands the popular conservation dictum "use it or lose it" should read: "use it and you're sure to lose it".

The two examples of my research that I have explored this evening suggest that there is much to be gained by exploring interactions between disciplines. Here the interaction is between physiology and macroecology, and the interaction between large-scale distributional patterns and species conservation. Mr. President, ladies and gentlemen, I hope that my presentation will have convinced you that this kind of individual-based interdisciplinary work is of value, and perhaps too little explored in an era that sets great store by individual specialization.

**MERIT CERTIFICATE 1999:**  
**RECIPIENT: PROFESSOR GEOFFREY FALKSON**

Professor Geoffrey Falkson, retired Head of the Department of Oncology of the University of Pretoria, was awarded a merit certificate for many years of outstanding contribution to the research and treatment of cancer.

Prof Falkson is a medical oncologist who has been involved in academic and highly specialized activities such as medical scientific development of medical oncology in South Africa, research, tertiary health training and service delivery for cancer patients in South Africa for more than four decades. He excelled at this level in making contributions towards the improvement of health and health care delivery for people with cancer through the rendering of exceptional health services, the development of health science and research as well as the training of health professionals in the field of cancer medicine. He received international recognition for these outstanding achievements.

Geoffrey Falkson qualified as a medical doctor in 1955 (MBChB from the University of Pretoria). In 1957, he passed the State Board Examination of the University of Ann Arbor, Michigan, USA, and after postgraduate training at the Henry Ford Hospital in Detroit, returned home to further his training and become a founder member of the then internationally new discipline of Medical Oncology. In 1962 he received the degree MMed(Int) and in 1965 an MD(cum laude) from the University of Pretoria.

In 1964 he was appointed as consultant in the newly developed discipline of cancer medicine, and by 1967 was appointed as Head of the Department of Medical Oncology at the Pretoria Academic Hospital and University of Pretoria. He continued in this role until his retirement in December 1997. During this time an exceptional oncology service was established and rendered service to both the public and private sectors of South Africa. The quality of patient care was of an international standard and augmented by the availability of meticulously kept patient records, which are all still available and form a unique patient care and research database.

During four decades his research activities have resulted in many new and improved treatments and cures for cancer. His research activities were supported, both locally and internationally, by numerous grants.

Professor Geoffrey Falkson has more than 750 scientific publications.

His international recognition is further illustrated by numerous awards and honorary positions such as Permanent Visiting Professor, University of Wisconsin, Madison, USA for more than two decades.

Examples of Awards received by Prof Geoffrey Falkson are:

- Chosen as one of the Four Outstanding Young Men of the Year by JAYCEE South Africa:1971
- CH Rautenbach Gold Medal, Pretoria: 1977
- Medallion as Visiting Professor of The Royal Perth Hospital Australia:1977
- Academic Gold Medal from South African Academy of Science and Art: 1983
- Christo Beyers Medal: 1983
- Outstanding Achiever Award, University of Pretoria: 1989-1998
- Order of the Southern Cross, Gold: 1990
- Laureates Award from the Alumni Association, University of Pretoria :1991;
- Special Award for meritorious Service from the Eastern Cooperative Oncology Group, USA, 1997.

Professor Falkson was also recently the very worthy recipient of the International Award of Imminent Scientist of the Decade 1990 – 1999.



## MERIT CERTIFICATE 1999

### RECIPIENT ERLA HARDEN

Dr Erla Harden was awarded a merit certificate for five years of outstanding service to S2A3 as Secretary of the Pretoria Branch and as a Council member.

Erla Harden (nee Ortner) obtained the B.Sc. degree in 1991 and the B.Sc. (Hons) degree in Chemistry in 1992 from the University of Pretoria. She completed her M.Sc. degree (*Cum Laude*) in 1994 and Ph.D. in 1999, both in Chemistry at the University of Pretoria under the supervision of Prof ER Rohwer. Her postgraduate research entailed the characterization of the novel multichannel trap for the analysis of organic compounds in air and water samples. Her results showed that this new concentration method complements the powerful separation technique of gas chromatography very well, paving the way for its routine use in trace analytical laboratories.

Erla has published four articles in specialist international journals and has presented her work at a number of international and national conferences. She obtained the best poster award at the SAAMS-CHROMSA symposium in 1996. She also received the Chromatographer of the Year-1999 award from CHROMSA (Chromatography Division of the South African Chemical Institute) and the Scientific Excellence Award-2000 from the Bio/Chemtek division of the CSIR.



In 1998 she was employed as a Research Scientist at the AECI and soon afterwards transferred to the CSIR, where she at present holds the position as a Technical Expert in the Bio/Chemtek division.

## MERIT CERTIFICATE 1999:

### RECIPIENT: DR LAJOS VARI

Dr Lajos Vari was born in 1916 in Hungary. He emigrated to the Netherlands around 1922 to live with foster parents and received his education in the Netherlands. During World War II and early postwar years he was employed at the University of Amsterdam and the Natural History Museum. Because of poor employment prospects he emigrated to South Africa in 1948 to take up a position with the Transvaal Museum, of which he was deputy director for some time.

From early on he specialised on Microlepidoptera, in particular leaf miners. His early publications (1941 – 1944) were on Dutch fauna, dealing with various groups of Micro- and Macrolepidoptera. From 1955 onwards the focus of his publications are on Southern African micros, notably Lithocolletidae. He obtained a D.Sc. from the University of Pretoria in 1961 for a monograph of South African representatives of that family. In 1973 he published a revision of Afrotropical Tineidae with LA Gozmany of the Natural History Museum in Budapest.

Dr Vari occasionally did work on Rhopalocera such as the 1971 revision of the genus *Tarsocera* Butler (Nymphalidae: Satyrinae), the 1983 description of new species of *Lepidochrysops* Hedicke (Lycaenidae), with D A Swanepoel and other smaller contributions. He also edited the 1979 posthumous volume 4 of van Son's *Butterflies of Southern Africa*

In 1986 he published the important Southern African Lepidoptera – a series of cross-referenced indices (with D M Kroon).

Although active in a variety of fields, Dr Vari's main contribution lies in two areas: firstly the painstaking rearing of leaf-



mining Lepidoptera, producing not only specimens of the highest quality of many new taxa, but simultaneously providing host plant records and secondly his considerable collecting efforts in many areas, which will provide material for study for a long time to come.

Although retired since 1986, Dr Vari is presently curator emeritus of the Lepidoptera Department and engaged in the preparation of a checklist of Southern African Lepidoptera. Having lost his first wife in 1991, he recently remarried. He has three children.

### **MERIT CERTIFICATE 1999:**

### **RECIPIENT: PROFESSOR WILLEM OELOFSEN**

A merit certificate was awarded in absentia to Professor Willem Oelofsen in recognition for many years' service to S<sub>2</sub>A<sub>3</sub> as Vice President: Eastern Cape.

Professor Oelofsen is Head of the Department of Biochemistry and Microbiology at the University of Port Elizabeth. He has a PhD in Biochemistry from the University of California. His research fields are functional peptides and proteins of the ostrich (*Struthio camelus*) and the development and metabolism of adipose tissue.

He is a member of the SA Society for Biochemistry and Molecular Biology, the Society for Endocrinology, Metabolism and Diabetes of Southern Africa, the SA Akademie vir Wetenskap en Kuns, the Southern African Association for the Advancement of Science (S<sub>2</sub>A<sub>3</sub>) and the SA Council for Natural Science Professions.

Professor Oelofsen held the following positions:

- Founder member of the National Council of the SA Biochemical Society
- 
- President, SA Biochemical Society
- 
- Deputy Dean: Faculty of Science, University of Port Elizabeth
- 
- Senate representative on the Council of the University of Port Elizabeth
- 
- Chairperson of the UPE Research Committee

He has 94 publications and has received the Beckman Gold Medal of the South African Society for Biochemistry and Molecular Biology.

**ANNUAL MEDAL AWARD  
CEREMONY  
6 November 2000**

**SOUTH AFRICA MEDAL  
(GOLD) 2000**

**RECIPIENT:**

**PROF KANTI DAYA BHOOLA**

**RUDOLF MARLOTH  
MEMORIAL LECTURE**

In his Rudolf Marloth Memorial lecture Prof Bhoola gave an overview of his career and family as well as a brief presentation on his research on the bioregulation of the Kallikrein-Kinin Cascade.

**MY JOURNEY INTO MUSIC,  
MEDICINE AND SCIENCE**

by

**Prof K D Bhoola**

Kanti Daya Bhoola loves a challenge, and indeed has faced many, grasping them as golden opportunities, which is why he is today a world-renowned scientist.

A strong believer in culture and traditions, Kanti, who was born in the farming community of Plessislaer, near Edendale, talks with great pride about his grand-father, Narotam Bhoola, who came to South Africa in 1890 from Gujarat, India, as an entrepreneur businessman.

The young Kanti Bhoola was eager to pursue a

career in medicine, but when he was unable to obtain a place in a Medical School in South Africa, he chose to spend time at the University of Witwatersrand where he was able to indulge his love of the arts and music. With the assistance of Sorabjee Rustomjee, a member of Natal Indian congress, who made it possible for him, his elder brother, and others to study Medicine at Ireland's University College, Dublin. And so, in 1950, after briefly participating in the Passive Resistance Campaign, the 19-year old fledgling scientist left the country.

In 1956 he graduated with an MB BCH BAO, achieving honours in every pre-clinical subject. He was then awarded an MRC PhD scholarship at University College, London, because, according to Kanti, of his prowess on the cricket pitch. It was during this time, that Kanti discovered a novel kinin (a peptide which has a key role to play in the spread of inflammation) in hornet venom. Inquiring into the molecular mechanisms involved was to become the subject of his pioneering research in the field of bioregulation of kinins in health and disease. He received his PhD from the University College, London, in 1961, and an MD from the National University of Ireland in 1966.

Kanti says he's had many "opportune moments" in his career, for example literally walking into Pharmacology. He was sauntering down Mortimer Street in 1962 when he met the Professor of Pharmacology at Middlesex Medical School, and at that moment was offered a job as a lecturer in Clinical Pharmacology. Soon after marrying in 1966, he moved to the University of Bristol where he later became a Reader in Pharmacology. Kanti thus developed his illustrious career in research that earned him recognition as a world leader in his field. The enormous impact that he made is evidenced by the wealth of articles published in internationally recognised journals, and his distinguished teaching career.

He specialised in the study of the Kallikrein-Kinin Cascade. The kallikreins are a family of enzymes in cells and body fluids, which play a vital role in the generation of inflammation, in the operation of the immune



system, and in metastatic cancer.

He talks proudly of his two daughters, both accomplished musicians. The elder, Ishani, an International Violinist and the younger, Harshini a cellist, in addition, a Chemical Engineer.

Kanti was faced with another major challenge when he returned to South Africa. His desired aim was to create a basic medical science research unit to train young, able graduates for the benefit of academic medicine. He revamped almost non-existent basic research in the department of Experimental and Clinical Pharmacology at the University of Natal. Dedicated to Research and the University, Kanti Bhoola steadfastly pursues excellence, overseeing postgraduate students. He said recently: "my aim has been to establish centres of excellence, so that those inculcated with a research ethos will promote it long past my departure." Currently at Technikon-Natal and ML Sultan Technikon, he sees this challenge as part of the process of reconstruction.

In 1996 he was elected Fellow of the Royal Society of South Africa in recognition of his contributions and in the same year was awarded an International Gold Medal from the EK Frey-E Werle Foundation. He has been also part of South Africa's 'A team' of scientists. He received an outstanding merit award from the Medical Research Council, a Gold Medal, for his cutting edge work in the role of enzymes and peptides in inflammation-related disorders such as arthritis and asthma. He was also acknowledged for his molecular work in the field of cancer, particularly oesophageal cancer. Kanti is of the view that new drugs relevant to the kallikrein-kinin cascade will be of long-term benefit to patients.

As he prepares to turn new challenges into golden opportunities he allows a parody on the words of Charles Dickens in the closing lines of Tale of Two Cities to speak for him: "It is a far better journey that I travel than I have ever..."

Professor Bhoola spans four decades of research on the Bioregulation of the Kallikrein-Kinin Cascade

Kallikrein-kinin cascade: Recent evidence increasingly supports the view that kinins exercise an important regulatory control in inflammation and in the growth and proliferation of cancer cells. Kinins are formed by the serine proteases, plasma and tissue kallikreins. Plasma and tissue kallikrein, differ in

molecular weight, pi, substrate specificity, immunological characteristics, type of kinin released and functional importance. In their functional capacity as proteases, they release the vasoactive kinin peptides from multifunctional protein molecules called kininogens, of which two species have so far been described in humans. PK cleaves bradykinin from a H-kininogen (HK), whereas TK forms kallidin (lys-bradykinin) from L-kininogen. Plasma kallikrein (PK) is synthesized in the liver, and circulates as a trinity complex with H-kininogen and factor XI of the intrinsic clotting system on the outer surface of the human neutrophil. In contrast, tissue kallikrein (TK) is found in many organs, occurring within particular cells, and was recently discovered in the granules of the human neutrophil by Bhoola and colleagues. The regulatory control exercised by kallikrein forms an intricate, endogenous cascade thought to be involved in the regulation of cellular events that are believed to fulfill a role in post-translational processing of polypeptides. The induction of kallikrein genes results in either increased or new expression of this protease resulting in an increased capacity to form kinins. The kinins so formed are considered to play a primary role as inflammatory mediators by causing constriction of venules, dilation of arterioles, increasing permeability of the capillary membrane, and interacting with sensory nerve terminal transmitters to evoke pain. Therefore, these bioactive peptides are attractive autacoids that release nitric oxide (EDRF) from endothelial cells. The various cellular actions of kinins are modulated by the activation of two specific receptors, B1 and B2. Both these receptors have been cloned, and are linked to specific G protein-coupled second messenger signalling systems. These proteases are encountered in biological fluids, tissues and neutrophils. Regulatory processes such as organ perfusion, systemic blood pressure, sodium and water homeostasis, regulation and maturation of growth factors and inflammation are regulated by the enzymically generated kinins. The development of TK inhibitors as well as kinin receptor antagonists for use in immune-modulated disorders and in tumours may provide a new generation of drugs of therapeutic value.

#### MOTION OF APPRECIATION

A motion of appreciation is hereby expressed to Professor RA Preston-Whyte for his service to S2A3. Professor RA Preston-Whyte retired from the University of Natal at the end of 1999 and nominated Professor W Ellery to succeed him as Vice President KwaZulu-Natal.

**BRITISH ASSOCIATION MEDAL  
(SILVER) 2000**

**RECIPIENT:  
PROFESSOR CHRISTIAAN ALDRICH**

Prof Christiaan Aldrich is Professor in the Department of Chemical Engineering at the University of Stellenbosch since January 1999. He obtained the M. Eng. (Extractive Metallurgy) with a thesis titled "Induced Aeration in Liquids and Slurries in Agitated Vessels" and a Ph.D. with a thesis, titled "The Simulation and Optimization of Steady State Process Circuits by means of Artificial Neural Networks".

He is a member of the following societies:

- The South African Institute for Chemical Engineers
- The South African Institute for Mining and Metallurgy
- The American Association for the Advancement of Science
- The IEEE Computer Society.

He has extensive industrial experience and has provided consulting services to various companies. With funds raised mostly from outside the University of Stellenbosch, he established a well-equipped laboratory for process systems research and modeling from 1995 to 1998. Various sophisticated algorithms for machine vision systems and intelligent process systems had to be designed and maintained in-house, while other items of experimental equipment likewise had to be designed in-house.

He is a member of various university committees and has provided professional service to committees of various professional societies and bodies.

He has organised 18 workshops and has published 60 papers in refereed journals. Another 8 papers have been submitted for publication. He has contributed 9 refereed chapters in



books. A book, titled "Exploratory Analysis of Metallurgical Process Data with Neural networks", Elsevier, Amsterdam has been provisionally accepted for publication in 2001. He has published 26 refereed full-length papers in the proceedings of international symposia and has presented 33 non-refereed papers at international symposia and workshops and 51 at national symposia and workshops. He has produced 37 unpublished research reports and has registered 3 patents.

Professor Aldrich has supervised 5 completed doctoral theses and 11 masters theses.

He received the following rewards:

- President's award of the Foundation for Research and Development (FRD) for international recognition of research (1995)
- Researcher of the Year, Faculty of Engineering, University of Stellenbosch (1995)
- Silver Medal of the South African Institute of Mining and Metallurgy (1999)
- Rector's Award for Research Excellence (2000)

**SUMMARY OF RUDOLF  
MARLOTH MEMORIAL  
LECTURE**

**DATA-MINING: GOLD RUSH OF  
THE NEW MILLENNIUM?**

by

**Chris Aldrich**

Stimulated by progress in computer technology and information systems, recent decades have seen the growth of huge data bases, in fields ranging from astronomy, supermarket sales and banking, medicine, particle physics, chemistry to official and government statistics. For example, the well-known human genome project has already collected gigabytes of data, while the Digital Palomar Observatory Sky Survey involves 3 TB of data. Likewise, future sources of astronomical data from large uniform digital sky surveys covering a range of wavelengths, will involve pixel information contents measured in

the petabyte range. The American retailer WalMart makes over 20 000 000 transactions daily. AT&T has roughly 100 000 000 customers and carries 200 000 000 calls daily on its long distance network. Mobil Oil claims to store over 100 TB of data concerning their oil exploration. Although these databases are large, future databases promise to be immense by today's standards. For example, NASA Earth Observing System is projected to generate around 50 GB of data per hour at the turn of the century. On an annual basis this is equivalent to all the information contained in the Library of Congress.

These data repositories are increasingly viewed as an important resource, containing large amounts of untapped information that can provide a competitive edge in the global markets of the next millennium. We can no longer formulate the problems in our scientific inquiries or engineering investigations simply in terms of materials, missing facts or inadequate metrology. Instead, problems are increasingly viewed from a different perspective, concerning questions about information and knowledge itself. Many unrelated fields such as psychology, engineering, economics, medicine, artificial intelligence or genetics begin to assume a similar form when seen in the light of their common problems of dealing with information, uncertainty and complexity. We thus need to know how to deal with uncertainty, reduce complexity and use information, not in a particular context, but in the form of general principles and representations that remain valid regardless of the context.

Unfortunately, this proliferation of data does not always lead to a concomitant increase in knowledge or insight into the processes represented by the data. Whereas the databases of the 1960s were designed to be consistent, reduce redundancy, share data, enforce standards, maintain integrity, apply security restrictions and to balance conflicting requirements, today's trend is towards the design of terabyte warehouses, where the opposite approach is taken with regard to the organization of data.

It is therefore not surprising that exploratory data mining is considered to be one of the key enabling technologies of the 21<sup>st</sup> century. The basic principle behind data mining and knowledge discovery is the refinement of raw data into more compact and interpretable representations. These structured representations lend themselves to analysis and the recognition of higher order patterns or knowledge discovery. Although many of the techniques underpinning data mining has been established for several decades, it is only now with the growing availability of computer processing power that these methods have become useful tools in the hands of data analysts and domain specialists. The lecture reviewed some of the most recent advances in the field, problems, applications and future developments.

### **MERIT CERTIFICATE 2000:**

#### **RECIPIENT: HERMANN ORTNER**

Mr Herman Ortner received a merit certificate for his dedicated and meticulous service to S<sub>2</sub>A<sub>3</sub> as national Treasurer for the past seven years.

He was born on 12 October 1928 in Magdeburg, Germany of Austrian parents. He received his schooling in Magdeburg almost up to end of World War II. He was called up at the age of 15 in January 1944 together with the whole standard 7 high school class to serve with the German Airforce in the Anti Aircraft units at his hometown. He received partly further schooling for 16 months up to the end of the War.

Mr Ortner attended the University for Mining and Metallurgy in Leoben, Austria from 1947 to 1952 and obtained an Engineering degree in Metallurgy.

He worked from 1953 to 1956 in Dusseldorf, Germany with a Machine Design Firm for steelworks equipment, mostly rolling mills.

He emigrated in March 1957 with an ISCOR contract to South Africa in Pretoria. He worked for 35 years at ISCOR up to going on pension at 63 in 1991, mostly in Rolling Mills as production superintendent and manager in Pretoria and also for 14 years in Newcastle as well as in Projects and Metallurgical Research.

Herman married Ursula, nee Hahn, in 1957 and they were married for 37 years up to his wife's tragic death in 1996. He has 4 children, 2 sons and 2 daughters and 1 granddaughter.



## REPORT OF THE CHAIRMAN: PRETORIA BRANCH

One of the aims of S<sub>2</sub>A<sub>3</sub> is to create a meeting ground between scientists and between scientists and the layman interested in science. In pursuance of this goal the Pretoria Branch of S<sub>2</sub>A<sub>3</sub> is actively organising monthly meetings where academics and researchers talk about their work. The following lectures were presented during 1999 and 2000.

1 March 99	Prof L Botha The successes of artificial intelligence and pattern recognition
3 May 99	Dr Francis Thackeray Trying to make sense of the Homonid Family Tree
7 June 99	Prof J Heidema Logics for all seasons
2 August 99	Dr CK (Bob) Brain The Ancient Roots of Human Intelligence
6 September 99	Dr A Meiring The new Millennium: Facts and Figures
4 October 99	Martino, conjuror, illusionist Seeing is (not always) believing and magician
6 March 00	Prof M Horak Bioprospecting for Novel Drugs: Unlocking Nature's Medicine Chest
3 April 00	Prof D P Smits White Dwarfs, Neutron Stars and Supernovae
8 May 00	Prof S Chown Climate Change and Southern African Animals: The Future might be quieter
5 June 00	Dr A Keyser The Treasures of Drimolen
7 August 00	Dr M A Goccia Portugal Breast Cancer in the New Millennium
4 Sept. 00	Prof L van Rensburg The Human Genome Sequence - Changing the Face of Medicine
2 October 00	Prof D Grayson An Introduction to the Science of Learning and the Learning of Science

The notices of the meetings were all in the form of newsletters containing interesting news on new developments in science. Lectures were also regularly advertised in the local press. Attendance of meetings seems to be increasing.

The Pretoria Branch designed and implemented a website for S<sub>2</sub>A<sub>3</sub> containing general information on S<sub>2</sub>A<sub>3</sub> and notices of lectures. The website address is <http://s2a3.up.ac.za>. A List Server has also been established through which notices of lectures can be sent via e-mail.

Membership is steadily increasing and recruitment of new members remains a priority.

The Committee of the Pretoria Branch meets on a monthly basis to plan events and activities. The members of the Committee for 2000/2001 are : Dr Phil Minnaar (Chairman), Bridgit Davis (Secretary), Dr Elise Venter (Treasurer), Dr Glyn Jones, Dr Freek Kok, Walter Meyer and Quintin Odendaal.

I wish to express my sincere appreciation to the members of the Committee for their enthusiasm, to the Council for their support and to all the members of the Branch for their attendance at our meetings.

**Dr Phil Minnaar (Chairman)**

## S2A3 BRONZE MEDAL AWARDS

### TO BEST MASTERS STUDENTS AT UNIVERSITIES AND TECHNIKONS

#### AWARDED IN 1999

##### **University of Stellenbosch:**

Miss JM Swart (graduated in 1998)

M.Sc. Agric: [Genetics] (*cum laude*)

Title: "Evaluation of the Genetic Variation in Naturalised Populations of *Medicago polymorpha* in the Winter Rainfall Region of South Africa and the feasibility of a Breeding Programme to develop the Species as a Fodder Crop"

##### **Potchefstroom Universiteit vir CHO :**

Miss Jeanette Lotter (graduated in 1998)

M.Sc. [Pharmaceutical Chemistry] (*cum laude*)

Title: "The Resolution of Chlorthalidone Enantiomers by a Liquid Membrane"

##### **University of the Orange Free State**

Mnr Bernard Slippers (graduate in 1998)

M.Sc. [Mikrobiologie]

Title: "The Amylosternum of Sirex Noctilio in South Africa"

##### **Rand Afrikaans University**

Mnr Wiehan Le Roux (graduate in 1998)

M.Ing. [Electrical and Electronic] (*cum laude*)

Title: "n Ondersoek na Begrensing by die Kompensasie van Vervorming in 'n Elektriese Energieverspreidingsnetwerk"

##### **Rhodes**

Ms N S Cattaneo (graduated in 1998)

M.Sc. [Economics] (*cum laude*)

Title: "The Theoretical and Empirical Analysis of Trade Integration among Unequal Partners; Implications for the Southern African Development Community"

##### **University of the Witwatersrand**

Mr Alastair Paulin-Campbell

M.Sc. [Physics] (*cum laude*)

Title : "Stabilisation of lower dimensional String Matrix Models"

##### **University of Cape Town**

Mr Gregory John Dickason

M.Sc. [Chemical Engineering]

Title: "Image Analysis of Bacillus Thuringiensis"

##### **MEDUNSA**

Mrs Johanna C Meyer

M.Sc. [Med Pharmacy] (*cum laude*)

Title: "The impact of effective prescribing training in primary care"

##### **Rhodes**

Mr Andrew A Eales

M.Sc. [Computer Science] (*cum laude*)

Title: "An Object-orientated Toolkit for Music Notation"

##### **University of Port Elizabeth**

Ms Jane Ball [nee Webb]

M.Sc. [Pharmacy] (*cum laude*)

Title: "A Drug Utilisation Study in a South African Asthma Patient population"

##### **University of Natal : Durban Campus**

Mr Neil Anthony Koorbanally

M.Sc. [Pure and Applied Chemistry] (*cum laude*)

Title: "Extractives from the Amaryllidaceae and Fabaceae"

##### **University of Natal : Pietermaritzburg Campus**

Miss Leigh McLoughlin

M.Sc. Agric. (*cum laude*)

Title: "An Investigation of Factors influencing rate of Lay, Egg Weight and Embryonic Growth in Broiler Breeder Hens"

##### **University of Pretoria**

Mnr Lukas Johannes du Plessis

M.Eng. [Mechanical Engineering]

Title: "An Optimization Approach to the Determination of Manipulator Workspaces"



#### **Bronze 1999**

At the 1999 bronze medal award ceremony, University of Pretoria, Prof J A Snyman, study leader, Mr Lukas du Plessis, winner 1999 and Dr Phil Minnaar, S<sub>2</sub>A<sub>3</sub>.

## AWARDED IN 2000

### **University of Durban Westville**

Ms Busisiwe Precious Alant (graduated in 1999)

M.Sc. [ Science Education] (*cum laude*)

Title: "An Exploration of the Relation between Met-learning and Conceptual Change in the Development of the Conceptions of Force of Six Grade 7 Pupils"

### **University of Stellenbosch**

Mej CM Steinmann (graduate in 1999)

M.Sc. [Fisika] (*cum laude*)

Title: "Development and Characterisation of a Tunable Laser Source in the Vacuum Ultraviolet"

### **Potchefstroom Universiteit vir CHO**

Mnr G Koekemoer

M.Sc. [Statistics] (*cum laude*)

Title: "A Comparative Study of Non-parametric Density Estimators"

### **Rand Afrikaans University**

Miss J Price

MA [Psychology] (*cum laude*)

Title: "The Phenomenological Experience of Siblings of Traumatic Head Injuries Survivors."

### **University of the Witwatersrand**

Babalwa Atalanta Mbalo

M.Sc. [Botany] (*cum laude*)

Title: "Post-fire Effects on Germination of Selected Savanna Woody Plant Species"

### **MEDUNSA**

Ms Mary Pipedi

M.Sc. [Med] [Physiology] (*cum laude*)

Title: "Pavetti Harboril as a Cardiotoxin in the Rat"

### **University of Natal: Durban Campus**

Ms Carryn Cowan

M.Sc. (*cum laude*)

Title: "Mathematical Modelling of the Cellular and Population Dynamics of HIV and AIDS"

### **University of Natal: Pietermaritzburg Campus**

Mr Anthony Norman Brown

M.Sc. [Science and Agriculture] (*cum laude*)

Title: "Factors influencing Farmer's Choice amongst various Marketing Alternatives for Maize in South Africa"

### **University of Pretoria**

Mnr Rocco dV Duvenhage

M.Sc. [Mathematics]

Title: "Quantum Statistical Mechanics, KMS states and Tomita-Takesaki Theory"

### **University of Port Elizabeth**

Mr Hugh Donald Munro

M.Sc [Computer Science] (*cum laude*)

Title: "An Object-oriented Framework for implementing 3-Dimensional World Wide Web sites"

### **University of Cape Town**

Karl J Westerlund

M.Sc. [Geology]

Title: "A Geochemical Study of Diamonds, Diamond Inclusion Minerals and other Mantle Minerals from the Klipspringer Kimberlites, South Africa"



*At the 2000 bronze award ceremony, University of Pretoria. Prof Anton Ströh, Study leader, Dept of Mathamatics and Applied Mathematics, University of Pretoria, Mr and Mrs Duvenhage, Mr Rocco Duvenhage, Winner 2000, Dr Glyn Jones and Prof Johan van Zyl, Vice Chancellor, University of Pretoria. Dr Glyn Jones presentED the Bronze Medal on behalf of S<sub>2</sub>A<sub>3</sub>.*

## **S<sub>2</sub>A<sub>3</sub>'S TRIBUTE TO A SOUTH AFRICAN SCIENTIST**

Dr Clarice Gertrude Crocker, a Life Member of S2A3, passed away at the age of 92 on 12 January 2000. We offer our sincere condolences to her family.

### **Saamgestel deur:**

**Dr Phil Minnaar**

**Tel.: (012) 3477768**

### **Navrae:**

**Mev Shirley Korsman**

**Tel.: (012) 6672544**