

# S<sub>2</sub>A<sub>3</sub>

**SOUTHERN AFRICA ASSOCIATION FOR  
THE ADVANCEMENT OF SCIENCE**

**SUIDER-AFRIKA GENOOTSKAP VIR DIE  
BEVORDERING VAN DIE WETENSKAP**

**Jaarlikse Medaljetoekeningseremonie  
25 November 1994  
Annual Medal Award Ceremony**

## South Africa Medal (Gold)

**Michael Charles Kew** was born in Johannesburg and educated at Jeppe Preparatory and High Schools. He received the following degrees at the University of the Witwatersrand: M.B.Ch.B.; M.D.; Ph.D. (Med); and D.Sc. (Med). Prof Kew is also a Fellow of the South African College of Physicians and an M.R.C.P. (U.K.) and a Fellow of the Royal College of Physicians of London.

Prof Kew currently holds the Dora Dart chair of Medicine in the Department of Medicine of the University of the Witwatersrand, and is Senior Physician at the Johannesburg Hospital. Together with this appointment he is the Honorary Director of the Medical Research Council of the University of the Witwatersrand Molecular Hepatology Research Unit, and the Physician-in-charge of the Liver Unit, Johannesburg Hospital. Other appointments include: Honorary Senior Physician (Hillbrow Hospital); Consultant Hepatologist (Baragwanath Hospital); Honorary Consultant Hepatologist (Rand Mutual Hospital) and Honorary Research Associate with the South African Institute for Medical Research.

Prof Kew achieved some 19 academic distinctions. He received his M.B.Ch.B. degree 'cum honoribus primus' and the bronze medal of the Southern Transvaal branch of the Medical Association of South Africa for the most distinguished graduand in medicine. He was selected by Jaycee (South Africa) as one of the Four Outstanding Young South Africans in 1979. He received the American Liver Foundation Prize in 1984 and was the Fogarthy Visiting Scientist at the Laboratory of Infectious Diseases, National Institute of Health, Bethesda, Maryland, U.S.A.

Since 1967 Prof Kew held various academic positions, amongst others the Trotter Visiting Professorship of Baylor College of Medicine (Texas) and M.D. of Anderson Hospital and Tumour Institute (Houston, Texas).

Prof Kew is a member of various committees, including the Board of the Faculty of Medicine and since 1978 the Senate of the University of the Witwatersrand. Prof Kew is a member of the editorial boards of the 'Journal of Hepatology' and 'Medicine International'. He also reviews



manuscripts for international journals e.g. 'Gastroenterology', 'British Journal of Cancer', 'Lancet', 'Liver', and the 'American Journal of Gastroenterology'.

He is regularly invited to chair international meetings.

Prof Kew focused his research interests on liver disease and in particular the hepatitis B virus and its relationship to liver cell cancer. His original studies were largely clinical, but more recently he has become involved in hands-on laboratory-based molecular biological research. He is now the pre-eminent scientist in this field in South Africa and enjoys international recognition for his 311 publications.

In awarding the South Africa Medal (Gold) to Prof Kew, we take pride in recognising a person of his long-standing academic excellence as well as his brilliant contribution to the difficult field of hepatology.

*A Brief summary of the  
Marloth Memorial Lecture by*

*Professor MC Kew  
25 November, 1994*

## **Cancer of the Liver: TOWARDS AN UNDERSTANDING OF ITS CAUSES**

Although rare in most parts of the world, hepatocellular cancer (HCC) occurs commonly throughout sub-Saharan Africa and the Far East. Several causal associations of the tumour have been recognized. Depending upon their impact, these are regarded as major risk factors - chronic hepatitis B virus (HBV) and hepatitis C virus (HCV) infections, repeated exposure to the mycotoxin, aflatoxin B1 (AFB), and cirrhosis - or minor risk factors. In those regions where HCC is common, HBV is the major cause. There are some 300 million carriers of HBV in the world today: most of these become infected in early childhood, and they have a relative risk of developing HCC of over 100. Although HBV DNA has been shown to integrate into cellular DNA in liver cells, the exact mechanism(s) by which it induces tumour formation are uncertain. The virus does not contain an oncogene and it rarely integrates in relation to a known proto-oncogene. However, viral genes - the X gene and a 3' truncated preS/S gene - may activate in trans expression of cellular genes concerned with cell growth, cycling, or differentiation. HBV may also induce tumour formation indirectly by causing chronic necroinflammatory hepatic disease (cirrhosis), which in turn is complicated by neoplastic transformation.

AFB is derived from *Aspergillus flavus*, a ubiquitous mould that contaminates staple foods in tropical and sub-tropical regions. There is a positive correlation between dietary intake of AFB and the incidence of HCC. Recently it has become apparent that heavy exposure to AFB inactivates the p53 tumour suppressor gene by inducing a specific mutation, suggesting a way in which this toxin may contribute to hepatocellular carcinogenesis.

Chronic HCV infection is also closely associated with the occurrence of HCC. This is particularly true in Japan, Italy and Spain, where HCV accounts for up to 80% of HCCs. Because HCV does not intergrate into cellular DNA, a direct carcinogenic effect is unlikely. However, HCV-induced HCCs always co-exist with cirrhosis of chronic hepatitis, and it is probable that the virus induces malignant change indirectly by causing chronic necroinflammatory hepatic disease. Hepatocellular carcinogenesis is thus multifactorial in aetiology and its pathogenesis is a complex multistep process that evolves over many years.

## **The British Association Medal - Silver**

**Dr Simon Henry Connell** matriculated in 1978 from the Parktown Boy's High School in Johannesburg. He received his tertiary education from the University of the Witwatersrand and graduated with a B.Sc. in Physics and Maths, a B.Sc. (Hons) in Experimental and Theoretical Physics and lastly in 1988 he received a Ph.D. in Nuclear Solid State Physics. Currently he is a Senior Research Officer and on the Governing Committee with the Accelerator Physicist Portfolio at the Schonland Research Centre, University of the Witwatersrand. Dr Connell distinguished himself as an outstanding young scientist at a young age. This is attested to by the awards he has received up to date, specifically:



- 1987: Protea PNI Postgraduate Student Award, the premier award for young physicists of the South African Institute of Physics.
- 1987: Ablett Scholar of the Schonland Research Centre for Nuclear Sciences of the University of the Witwatersrand.
- 1988: Alexander von Humboldt Fellowship - taken at the Max Planck Institute fur Metalphysik of the University of Stuttgart in Germany, and the Paul Scherrer Institute in Switzerland.
- 1991: FRD evaluation 'P' (Presidential Awardee) status.
- 1992: The Research Award of the Vice-Chancellor of the University of the Witwatersrand: the premier annual award of the University of the Witwatersrand in recognition of outstanding excellence in research capability of members of staff.
- 1993: The Meiring Naude Medal of the Royal Society of South Africa: a major national recognition of research excellence in young South African scientists.

Dr Connell is an experimental physicist who has specialized in the use of accelerated ion and electron beams in the study of materials, specifically in the field which he is pioneering might be termed 'Minerals Physics', even more specifically the very important field within that of Diamond Physics. Through this important research Dr Connell has published 38 refereed publications in International Journals, delivered 32 international conference presentations and 21 local conference presentations.

From the above it is clear that Dr Connell has rapidly developed to become an active and effective scientist on the world scene, one who initiates and leads research programmes at the major accelerators in the world.

The British Association Medal (Silver) is awarded annually by the S<sub>2</sub>A<sub>3</sub> to an outstanding young scientist. Simon Connell has proved himself a most deserving and worthy recipient of this honour.

## **Annual Report Pretoria Branch 1994**

At the first meeting of the year Mr Pieter van Niekerk, Head of Capital College, gave an exposition of the advanced educational approaches used for teaching mathematics and science at this school. Professor Erens and Dr Delene Visser of Unisa, Mrs Lana Leuner, Head of the Wiskunde Sentrum in Pretoria were among the other speakers at this occasion.

At the May meeting Dr Horst Kustner, of the Dept. of Health and Population gave an important talk on Aids in Southern Africa. Speakers at the June, July and August meetings were Dr Ingrid Weinert, Project Manager, Foodtek CSIR, Professor Erik Holm who sketched a sad scenario of research for the Natural

Sciences at present and Dr Alex Berzin who talked on the Buddhist Views of Science and Tibetan Healing. In October Dr Roy Jobson, medical doctor, gave a talk on the pioneering multimedia project now on TV, radio and in the newspapers called Soul City. In November Dr Freek Kok closed the year's proceedings with his talk on the newly established BScEd degree offered at the University of Pretoria.

In conclusion, I wish to thank my committee for their loyal support during my years in office as Chairman of the Pretoria Branch of the S<sub>2</sub>A<sub>3</sub>.

Dr Bertha van Drimmelen

## Merietesertifikaat/Merit Certificate

**Gerard den Dulk** is op 1 November 1922 in Scheveninge gebore, maar groei in Den Haag op. Hy studeer in Haarlem waar hy in Siviele Ingenieur - Brug en Waterboukunde - promoveer.

Gedurende die oorlogsjare werk hy "ondergronds" om deportasie na die Duitse wapenfabrieke te ontkom. Met die slag van Arnhem werk hy as dykopsigter met 'n vervalste "ausweis" om Kanadese soldate snags oor die Waalrivier te kon begelei.

Einde 1944, met die bevryding van die suidelike deel van Holland, sluit hy by die lugmag aan en word na Indonesië gestuur waar hy die eerste jaar help om Nederlandse vroue en kinders uit die Japanse kampe te repatrieer. Na sy demobilisasie werk Gerard by die firma Javastaal Stokvis. Met die oornam van Sukarno en die daaropvolgende chaos emigreer hy en kom in 1948 in Kaapstad aan.

Vir die eerste paar jaar woon en werk hy in Durban waar hy ook getroud is. Die dorp Stanger aan die Noordkus bied die moontlikheid om 'n boubesigheid op die been te bring. Ten spyte van lang ure se werk stort Gerard homself ook in die gemeenskapslewe - as Stadsraadslid, voorsitter of tesourier of hardwerkende lid van verskeie verenigings soos die Tafelronde, Fosa, Santa en die Ouer-Onderwysersvereniging.

Met hul verhuising na Pretoria in 1977 het sy aktiwiteite meer na bourekenkunde oorgeslaan. Hier was hy ook lid van die NZAV, Stigting Oud Pretoria en in 1989 sluit hy by die S<sub>2</sub>A<sub>3</sub> aan en algou kry hy die pos van Ere-Tesourier, 'n taak wat hy met nougesette ywer aangepak het.

Met sy kenmerkende filosofiese inslag deel Gerard sy pensioenjare in segmente van belangstelling.

'n Kwart van sy tyd wy hy aan die verlede, helfte aan die hede en die ander kwart aan die toekoms. Die toekoms wat versinnebeeld was in sy entoesiasme vir die rekenaar. Nie alleen vir alles wat hy daarmee kon uitvoer nie, maar as die haas onontginde instrument van die toekoms.

Om die S<sub>2</sub>A<sub>3</sub> se waardering te toon vir sy onbaatsugtige bydrae, word aan Gerardus Antonius den Dulk posthuum 'n merietesertifikaat toegeken.

1-11-1922 - 8-1-1994



**Gencor Ontwikkelingstrust** is ons borge vir die bronsmedaljes wat elke jaar aan uitstaande magisterstudente in die wetenskapdisiplines aan elk van Suid-Afrika se 22 Universiteite toegeken word.

Die Gencor Ontwikkelingstrust is in 1983 daargestel.

Nie alleen Gencor se Werknemers se lewensomstandighede word deur die insette van die Trust geraak nie, maar talle gemeenskappe word daardeur bevorder.

Werkverskaffingsprojekte, opvoeding en onderwys word op allerlei vlakke aangepak. Die aanleer van vakvaardighede en kleinsake-vernuf word ook nie vergeet nie.

As an example of one of the Trust's programmes which addresses many of these issues is its school building programme. A joint venture with the education authorities, it is a national job creation programme in which 15 schools are being built by workers drawn from the unemployed in those communities where the Gencor Group has mining operations.

The Trust is active in numerous ways. It has established market gardens to provide vegetables for the local people. Through lifeskills training programmes people are discovering new talents, e.g. how to sew. Training is being provided for women who wish to establish daycare centres in their communities. The establishment of irrigation systems have, so far, provided five villages with running water.

In assisting its own people in these crucial areas, Gencor is making a contribution to the success of South Africa's Reconstruction and Development Programme.

Om die waardering van die S<sub>2</sub>A<sub>3</sub> te betuig, word 'n Merietesertifikaat aan mev. Estelle Dawes oorhandig, wat dit namens die voorsitter van Gencor Ontwikkelingstrust, mnr. Kobus Visagie, ontvang het.



Prof Johan Wolfaardt  
oorhandig die Merietesertifikaat aan  
mev Estelle Dawes

### Ons eie verteenwoordiger by IFAAST

Jac Fourie matrikuleer aan die Hoërskool Menlo Park, Pretoria, in 1993. Sy belangstelling in wetenskap word al in Std.4 geprikkel. In Std.8 ontvang hy 'n goue medalje by die Nasionale Wetenskap Expo en in 1992 word hy gekies om Suid-Afrika by die "International Space Camp" in Huntsville, Alabama te verteenwoordig. Daarna kom hy vierde in die Suid-Afrikaanse Wetenskap Olimpiade en as prys kan hy die "International Science Forum" in London bywoon.

Met 'n hupstoot van S<sub>2</sub>A<sub>3</sub>, wat daardeur een van sy belangrikste doelstellings uitleef, nl. die bevordering van die wetenskap onder die jeug, kry die jonge Jac Fourie die kans om in 1994 die algemene jaarvergadering en kongres van IFAAST en die British Association for the Advancement of Science by te woon.

Jac se tema tydens die kongres was: "Promoting Science Among the Youth". As ons verteenwoordiger word Jac as een van die sewe lede van die Uitvoerende Komitee van IFAAST verkies, om Suid- en Suider-Afrika te verteenwoordig.

Hy is tans student in Chemiese Ingenieurswese aan die Universiteit van Pretoria. Ons wens hom alle sukses toe met sy loopbaan.

## Gencor - S<sub>2</sub>A<sub>3</sub> Bronze Medals 1994

- University of the Orange Free State:**  
Annerita Kuhn M.Sc.  
'Purification and Characterization of an Aldo/Keto Reductase of *Saccharomyces Cerevisiae*'
- Universiteit van Pretoria:**  
Mnr KJ Swanepoel M.Sc. (Wiskunde) - Cum Laude  
'Euclidean Ramsey Theory'
- University of Port Elizabeth:**  
Dr I Truter M.Sc. (Clinical Pharmacology)  
'A Drug Utilization Study to Establish Norms for Rational and Cost-Effective Use of Medicine'
- Potchefstroomse Universiteit vir CHO:**  
Mev N Potgieter M.Sc.  
'Defektor Tetrahydrobiopterien Homeostase in 'n Swart Familie met Hiperfenielalanienemie'
- University of Cape Town:**  
Mr PO Moon M.Sc. (Electrical Engineering)  
'An Investigation into the Design of a Satellite Based Stereo Imaging Sensor and the Use of Automatic Image Matching in the Production of Digital Elevation Models'
- Rhodes University:**  
Mr SD Bangay M.Sc. (Computer Science) with Distinction  
'Parallel Implementation of a Virtual Reality System on a Transputer Architecture'
- University of Durban-Westville:**  
Mr K Perumal M.Sc. - Cum Laude  
'Molecular Characterization and Detection of *Xanthomonas albilineans*, the Sugarcane Leaf Scald Pathogen'
- University of the Western Cape:** Mr Q Johnson M.Sc. (Zoology) - Cum Laude  
'The Effects of Elevated Protein Concentrations on Calcium Metabolism and its Implications for Bent-Leg Syndrome in S.A. Mutton Merino Rams'
- University of Natal Pietermaritzburg:**  
Mr DF van der Riet M.Sc. (Agricultural Economics)  
'Impact of Export Demand on South African Deciduous Fruit and Farmland Values'
- University of Natal Durban:** Mr CA Meijer M.Sc. (Electronic Engineering)- Cum Laude  
'A Study of Patch Antennas for Arrays: Modelling and Measurement'
- University of the Witwatersrand:**  
Richard Brooksbank
- Randse Afrikaanse Universiteit:** Mnr L Fouche M.Ing. (Elektroniese Ingenieurswese) - Cum Laude  
'Multisimbool Lynkodes met Hoër Orde Spektrale Nulle by Gelykstroom'

## In Memoriam

Na 'n lofwaardige loopbaan as Chemiese Ingenieur, skrywer van 216 publikasies en ontvanger van talle toekennings, sterf David Gerhardus Roux in 1994.

Gedurende die laaste jare van sy lewe tree professor Roux op as evalueerder van die genomiseerde vir die Suid-Afrika Medalje (Goud) en die British Association Medal (Silwer), 'n taak wat vir die S<sub>2</sub>A<sub>3</sub> van groot waarde was.

David G Roux se oorlye word deur alle S<sub>2</sub>A<sub>3</sub>-lede betreur.

## Annual Report of the Southern Africa Association for the Advancement of Science 94/11/25

One of the major problems facing developing nations is the under-utilisation of scientific and technological information needed in the war against hunger, diseases and all aspects of underdevelopment" ... popularisation of science and technology in Africa must involve effective flow of relevant information from scientists to the public and vice versa" (Science International 1988, 33:9-10). This recommendation has been one of the objectives of this association for decades.

In the past year the council gathered five times to attend to business. Amongst others a contribution was made to the Mammal Research Institute at Pretoria University. In an effort to rejuvenate the organisation we not only appointed youth members on the council, we also sent a young student to the UK to represent us at the IFAAST meeting. His report will be presented tonight.

We honour the memory of our treasurer Gerard den Dulk and we appreciate Herman Ortner's willingness to take over the computer work. I would also like to express our gratitude for the use of the facilities of the University of Pretoria for so many years and we are very privileged to have the use of this magnificent hall for our future meetings. The kindness of the principal in this regard is acknowledged.

Being a voluntary organisation the S<sub>2</sub>A<sub>3</sub> has all the shortcomings of such, but fortunately also the dedication of members who work and strive without remuneration. Let it not be said without recognition: I personally applaud each and everyone of the council members for all their selfless service in aid of the advancement of science.

Johan Wolfaardt: National President

## Nasionale Raad 1994-1995

President:	Prof J A Wolfaardt
Vise-Presidente:	
Wes-Kaap:	Vakant
Oos-Kaap en Natal:	Dr W Oelofsen
Vrystaat en Noord-Kaap:	Prof M J Wingfield
Gauteng:	Dr F Korb
Ander streke:	Mnr E Hanau DR B van Drimmelen
Ere-Tesourier:	Mnr H Ortner
Ere-Sekretaris:	Mev A Bentum
Addisionele lede:	Mnr Jac Fourie Mej E Ortner
Oud-Presidente:	Prof G van Drimmelen (Ere-lid) Prof J P F Sellschop Prof P Smit
Verteenwoordigers:	
Pretoria-tak:	Voorsitter: Dr F Kok Sekretaris: Mev A Culligan Tesourier: Mev U Ortner Addisioneel: Mev E den Dulk

Saamgestel deur:  
Mev Esme den Dulk  
Pretoria, November, 1994  
Tel (012) 341-8456

Navrae: Mev Anne Bentum  
Posbus 31226  
Totiusdal 0134  
Tel (012) 73-5978