

Pretoria Branch S₂A₃ News

April 2004

A newsletter of the Pretoria Branch of the Southern Africa Association for the Advancement of Science

Our forthcoming talk:

Date: Wednesday, 7th April 2004

Time: 17h15 (to 18h15)

Venue: Discovery Centre,
University of Pretoria Main Campus
(Use the Prospect Street Entrance to the campus. The Discovery Centre is in the large white building on the right of the road approx 100 m from the Prospect Street Entrance.)

Speaker: Dr Phil Coleman
Protechnik Laboratories,
Highveld Technopark, Centurion

Topic: An Overview of Chemical Defence R&D in South Africa

Refreshments will be served after the talk.

Talk Summary

The talk will present an overview of defensive measures used against chemical warfare agents and toxic chemicals and will outline the research and development work performed by Protechnik Laboratories in this area.

Mary E. Barber – an early South African naturalist

Cornelis Plug, plugc@mweb.co.za

Mrs Mary Elizabeth Barber (born Bowker), whose life spanned most of the nineteenth century, was the most prominent South African lady naturalist of her

time. The following sketch of her life and work is based on her biography as written up for the S₂A₃ Biographical Database of Southern African Science.

The Bowker family

Mary E. Bowker was born on 5 January 1818 at South Newton, Wiltshire, England, the eldest daughter of Miles Bowker and Anna M. Mitford. At the age of two years, she came to the Cape Colony with her parents and eight brothers in a party of 1820 settlers. The family settled on the farm Tharfield in Lower Albany, overlooking the mouth of the Great Fish River. Here Mary received an elementary education at a farm school set up by her father, and developed an interest in natural history which was shared by several of her brothers. One of them, James Henry, became an expert on local butterflies, while another, Thomas Holden, was the first person to recognise and collect prehistoric stone artefacts in South Africa.

Mary married Frederick W. Barber in 1845 and after the seventh Frontier War of 1846, 1847 they settled on the farm Highlands, near Grahamstown. Their two sons, Frederick and Henry Barber, later discovered the gold deposits at Barberton and the town was named after them. Mary had a keen inquiring mind, an artist's eye for detail, and the ability to describe clearly what she had observed. Her first paper in an overseas journal, "On fascination", was published in the popular British journal *Scientific Opinion* in 1869 and dealt with the hypnotic effect that snakes appear to have on their prey.

Botanising in the Eastern Cape

Mary's interest in botany was inspired by reading *The genera of South African plants...*, published in Cape Town by W.H. Harvey in 1838. Collecting, painting and studying the plants of the district became an important aspect of her life, and helped to ease the hardship associated with having her house burnt down twice during the frontier wars. She started a scientific correspondence with Harvey, who had settled in Dublin, Ireland, in 1842, and over the years sent him her observations and about 1000 specimens. Harvey acknowledged her scientific assistance in his *Flora Capensis* (1859 1865) and named the genus *Barberetta* and the asclepiad species *Brachystelma barberiae* in her honour. Her watercolour painting of the latter species was

published in Curtis's *Botanical Magazine* in November 1866, while her first botanical paper, "The aloe, its habits and culture" appeared in the *Journal of the Royal Horticultural Society* in 1870.

She was particularly interested in the genus *Stapelia* and did her best to produce a complete series of illustrations of its species, discovering two new ones in the process. Her notes on the genus were published after her death under the title "Stapelias" in *Kew Bulletin* in 1903. Meanwhile she had started a correspondence with Joseph Hooker, the Director of the Royal Botanical Gardens at Kew, London, and over many years provided the institution with numerous plant specimens. Hooker passed on some of her papers to Charles Darwin, whose book on Fertilisation of orchids (1862) triggered her interest in the fertilisation of plants. Her observations on this topic lead to the publication of two papers in the *Journal of the Linnean Society* (botany) in 1870 and 1871, dealing with the structure and fertilization of two plant species.

During the 1860s, she became interested particularly in insectivorous plants. Her paper on this topic was read before the Albany Natural History Society in Grahamstown in June 1869, and before the Linnean Society by Hooker in December 1870.

Studying butterflies

Mary began to paint the butterflies and moths of Albany, often on the flowers that they frequented, after reading a small book on South African butterflies published in 1862 by Roland Trimen in Cape Town. She started corresponding with Trimen in May 1863, sending him specimens as well as her observations on a fruit eating moth that had caused considerable destruction in the Grahamstown area. Her observations showed that some moths were capable of penetrating tough fruit membranes and Trimen passed her notes on to Charles Darwin. Her "Notes on the peculiar habits and changes which take place in the larvae of *Papilio Nireus*", dealing with the colour changes she had observed in the larvae and pupae of this butterfly, was also sent to Darwin, who passed it on for publication in the *Transactions of the Entomological Society* in December 1874. Darwin had meanwhile enlisted her help in his research on the expression of the emotions in man and animals and she was very flattered to receive a copy of the resulting book from him when it was published in 1872.

A further interest: Birds

During the 1860s Mary started to observe and paint birds and corresponded with E.L. Layard, Director of the South African Museum in Cape Town. He acknowledged her help in his *Birds of South Africa* (1867) and other publications. Some of her paintings of birds came to the attention of the Austrian ornithologist August von Pelzein; as a result, she was elected a corresponding member of the Ornithologischer Verein in Vienna – probably the first female member of this august society.

On the diamond fields

In 1870 Fred Barber and other members of Mary's family, including her two sons, went prospecting for diamonds in the Kimberley area. She joined them during the next year. Among the notable persons that she met there were the geologist Edward J. Dunn, the explorer Frederick C. Selous, and Cecil John Rhodes. Her interest was aroused by the stone artefacts found on the diggings and she collected a number of these and sent them to the South African Museum. In an article, "In the claims", published in the Cape Monthly Magazine in 1872, she gave a brief description of archaeological remains found at Colesberg Kopje and other sites. She recognized that the stone artefacts differed from, and were much older than, those used by the more recent Bushmen. Two further articles by her in the Cape Monthly Magazine described life on the diamond fields.

Member of the SA Philosophical Society

When the South African Philosophical Society (later the Royal Society of South Africa) was founded in Cape Town in 1877 Mary promised Trimen that she would write a paper for it. She wrote "On the peculiar colours of animals in relation to habits of life", which was read at the meetings of 29 May and 26 June 1878 and published in the society's Transactions. It was written in response to an article by Alfred Russell Wallace in which he questioned Darwin's views on sexual selection. Mary, who was a devoted follower of Darwin, provided numerous examples among insects, birds and mammals of fancy appearances in males for the sole purpose of being selected by females. Trimen invited her to become a member of the society – a singular honour for a woman at the time – and she was elected a corresponding member in June 1878. Soon she

submitted a second paper, "Locusts and locust birds", which was published in the same volume of the Transactions and dealt with the migratory locust swarms and the birds that prey upon them.

Later life

Her husband Fred went on a visit to England in 1879 and from then on Mary led a rather unsettled existence, staying with her brother James Henry in Durban during the winters and following her sons around the country as they farmed or went prospecting for gold. In 1886, they joined the rush to the Witwatersrand, where she started collecting plants again and resumed her correspondence with J. Hooker. In April 1889, she and her sons went to England and returned with her husband. When he died in 1892, she moved to Natal. In 1898, her son Frederick arranged the publication in London of her collection of poems, *The Erythrina tree and other verses*. The introduction contained a fine tribute by Trimen: "... wherever her lot for the time was cast, Mrs Barber has always been distinguished by her equanimity, cheerful self reliance, fine sense of humour and cool courage, but more than all for her steady perseverance in the pursuit of natural history researches". She died at the home of her daughter in Pietermaritzburg on 4 September 1899 at the age of 81. Before her death, she had presented her collections of plants, butterflies and paintings to the Albany Museum.

A significant but ironic tribute to Mary's achievements is her inclusion in the collection of biographies *Men of the times*, published in 1906. Later she was included in the *Dictionary of South African biography*, but the most comprehensive and accurate account of her life and work was published by Dr Alan Cohen of England, in the *South African Archaeological Bulletin* (Vol. 54, pp. 120-127) in 1999.

Join the S₂A₃:

- Annual membership fees:
 - Full: R60
 - Student: R30
 - Corporate: R500
- Contacts:
 - Mnr Walter Meyer / Dr Elise Venter
 - e-mail: s2a3@up.ac.za
 - www: <http://s2a3.up.ac.za/>

What is the S₂A₃?

The S₂A₃ aims to stimulate a broad public interest in science and its applications, research, discoveries, history, ethics and philosophy. To do so, the S₂A₃ arranges regular meetings, with speakers who are both entertaining and knowledgeable, as well as field trips, excursions and other interesting events.

Being added to our **e-mail address list** is *free*. Anyone wishing to receive S₂A₃ announcements via e-mail but who has difficulty using the listserv service, is welcome to send their address to: **owner-s2a3_announce@kendy.up.ac.za**

S₂A₃ Website & Listserv

Visit our **website** at <http://s2a3.up.ac.za>. Any comments or suggestions are welcome.

By subscribing to the S₂A₃ **Listserv** you will be notified via e-mail of forthcoming popular scientific lectures and other events of interest presented by the S₂A₃. See <http://s2a3.up.ac.za/> for more details.

To join this list, send an e-mail message to **majordomo@kendy.up.ac.za**, with the following command in the body of your message:

subscribe s2a3_announce <your e-mail address>

The listserv will respond with a message checking the validity of your e-mail address. Please follow the instructions in that message to complete your subscription. If you have difficulty in subscribing or unsubscribing from this list, or you have questions about the list itself, you may contact the list owner at: **owner-s2a3_announce@kendy.up.ac.za**.

Contributions to this newsletter

will be greatly appreciated. Please forward any news (in electronic format please – and less than 200 words) which might be of interest to members, whether scientific, professional or personal, to Walter Meyer **wmeyer@postino.up.ac.za**.

Members are also strongly encouraged to make suggestions for potentially interesting speakers for our monthly talks.

Pretoria Branch S₂A₃ News

May 2004

A newsletter of the Pretoria Branch of the Southern Africa Association for the Advancement of Science

Our forthcoming talk:

Date: Wednesday, 5th May 2004

Time: 17h15 (to 18h15)

Venue: Discovery Centre,
University of Pretoria Main Campus
(Use the Prospect Street Entrance to the campus. The Discovery Centre is in the large white building on the right of the road approx 100 m from the Prospect Street Entrance.)

Speaker: Dirk Robinson
Department Information Technology,
University of Pretoria.

Topic: Handling of Computer Viruses at the
University of Pretoria

Refreshments will be served after the talk.

Talk Summary

In his talk, Dirk Robinson will discuss computer viruses and the measures taken by the Information Technology department to protect users from this threat. He will also discuss the steps that users can take to prevent infection.

The 1761 transit of Venus in South Africa

Cornelis Plug, plugc@mweb.co.za

A transit of Venus occurs when Venus passes in front of the sun's disc, as seen from the earth. The planet appears as a small black spot moving slowly across the sun's disc over a period of several hours.

Owing to the different inclinations of the orbits of Earth and Venus, transits are rare events. Only four have been observed in detail, in 1761, 1769, 1874, and 1882. The next pair of transits will occur on 8 June this year and in 2012.

The former importance of transits

The four previous transits provided important opportunities for determining the scale of the solar system. Observers at widely different latitudes on earth see Venus projected in slightly different positions on the solar disc. Accurate measurements of such differences, coupled with knowledge of the observers' positions, allows one to determine the solar parallax, an important astronomical constant that reflects the distance of the earth from the sun. By applying the laws of planetary motion, one can use this distance to derive the distances of all the other planets from the sun. At present, some of these distances can be measured more directly and with much greater accuracy by radar and laser ranging, but this was not possible before the mid-twentieth century.

The astronomical importance of transits came to be realised during the 17th century. As the time of the next transit approached, intensive preparations were made and several expeditions were sent out to make accurate observations from widely separated stations. The all important date was 6 June 1761.

Mason and Dixon observe from the Cape

The last part of the transit was visible from South Africa, but its beginning occurred before local sunrise. Carefully timed observations of the moment when Venus seemed to touch the sun's rim at the end of the transit would nonetheless suffice, in combination with observations in Europe, to determine the solar parallax. However, there was no astronomical observatory in South Africa at this time and Cape Town, the centre of civilisation in the Dutch East India Company's colony, was a relatively small town. No plans were made to observe the transit here. The Royal Society of London planned to send the astronomer Charles Mason (1730-1786), an assistant at the Royal Observatory at Greenwich, to observe the transit at Bengkulu (then called Bencoolen), a small port on the south west coast of Sumatra. He was to be assisted by the surveyor and amateur astronomer Jeremiah Dixon (1733-1779). However, within hours after sailing in the "Seahorse"

from Portsmouth in December 1760 their ship was attacked by a French frigate (the two countries were at war at the time) and had to return to port to refit. Mason wrote to the Royal Society refusing to sail again, but changed his mind when the society threatened court action. They eventually reached the Cape of Good Hope on 27 April 1761, probably too late to reach their destination in time. Furthermore, Mason learned that Bengkulu had been taken by the French and decided to observe the transit from the Cape. This turned out to be a fortunate turn of events, as a second British expedition led by the astronomer Nevil Maskelyne, sent to observe from the island of St Helena, was clouded out.

Mason and Dixon erected a small observatory building and set up their equipment at Concordia Gardens in Cape Town, a public pleasure garden near Hope Street and Bouquet Street, behind the present St Mary's Cathedral. They had two reflecting telescopes of 600 mm focal length, a quadrant of 300 mm radius, and an astronomical clock. From 4 May to 27 September they observed the meridian passage of a number of bright stars to correct their clock, the zenith distances of the same stars to determine the latitude of their observatory, eclipses by Jupiter of its larger satellites to fix their longitude by comparison with similar observations in England, a total eclipse of the moon on 18 May, and of course the transit of Venus on 6 June. Despite some interference from clouds, their observations were successful and accurate. An account of the work, "Observations made at the Cape of Good Hope by Mr Charles Mason and Mr Dixon..." was published in the Philosophical Transactions of the Royal Society of London for 1761 (Vol. 52, pp. 378-394), with a brief appendix by Mason, "Latitude of the observatory at the Cape of Good Hope, reduced from observations of different stars" (p. 395). By comparing their observations with those of fifteen observatories in the northern hemisphere, J. Short derived a mean solar parallax of 8,65 seconds of arc (Philosophical Transactions, 1762, Vol. 52, pp. 611-628) - in good agreement with the modern value of 8,79 seconds of arc. Other results varied from 8,5 to 10,5 seconds of arc. An exhaustive review of all the observations during this transit, by 176 observers at 117 stations, was published in 1891 by the famous American astronomer Simon Newcomb. The weights he assigned to Mason and Dixon's observations were among the highest that he allotted.

The Mason-Dixon line

Sailing from the Cape on 3 October 1761 they travelled to St Helena, where Mason assisted Maskelyne for two months in collecting tidal data and other researches. Dixon was sent back to the Cape with a pendulum clock to measure its rate there, so that the earth's gravitational attraction at the Cape could be compared with that at Greenwich and other places.

As a result of their success Mason and Dixon were chosen in 1763 to survey the boundary line between Maryland and Pennsylvania in the United States. The line was to run exactly east west from a point some distance south of Philadelphia. In November 1767 the work was terminated, mainly because of opposition by the indigenous population. This so called "Mason and Dixon line" became famous as the supposed boundary between slave holding and non slave holding states. The work was written up under both their names as Field notes and astronomical observations... made in their survey of the boundary lines between the provinces of Pennsylvania, Delaware, and Maryland, 1763 1768. In the course of the survey, they measured an arc of meridian for the Royal Society, at a mean latitude of 39°, using wooden rods and without any triangulation. Despite taking great care the results were not completely satisfactory. They reported the project in "Observations for determining the length of a degree of latitude in the provinces of Maryland and Pennsylvania, in North America", published in the Philosophical Transactions of the Royal Society in 1768. Both men were elected members of the "American Philosophical Society held at Philadelphia for Promoting Useful Knowledge".

Mason and Dixon and the transit of 1769

Mason was employed by the Royal Society to observe the next transit of Venus on 3 June 1769 (not visible from South Africa) in Ireland, and for other work. His transit observations were published as "Astronomical observations made at Cavan, near Strabane, in the County of Donegal, Ireland" in the Philosophical Transactions (Vol. 60, pp. 454 496) for 1770. In 1773 he went to Scotland for the Royal Society and recommended the hill Schiehallion for Maskelyne's experiments aimed at demonstrating the gravitational attraction of mountains. His other work included preparing a catalogue of stars for the

Nautical Almanac, and compiling improved lunar tables at the request of the Board of Longitude. These tables were published in the Nautical Almanac for 1777 to 1796, to enable seafarers to determine their longitude at sea from observed angular distances between stars and the moon. Toward the end of his life Mason returned to Philadelphia, where he died.

At the time of the next transit of Venus Dixon too was again employed by the Royal Society to observe the event, this time from the island of Hammerfest, in the north of Norway, with W. Bayley. However, the weather was unfavourable and the observations fragmentary. Dixon's "Observations made on the island of Hammerfost, for the Royal Society" were published in the Philosophical Transactions (Vol. 59, pp. 253 261) for 1769. He was elected a fellow of the Royal Society of London in November 1773. As a bachelor he had no descendants, but the progeny of his brother have attained distinction as engineers and amateur astronomers.

Those interested in the literature dealing with the transits of Venus should consult the Transit of Venus bibliography by R.H. Van Gent, at <http://www.phys.uu.nl/~vgent/venus/venustransitbib.htm>.

For an excellent account of observations in South Africa during the 1882 transit, go to <http://canopus.saao.ac.za/~wpk/tov1882/tovwell.html>

Join the S₂A₃:

– Annual membership fees:

Full: R60

Student: R30

Corporate: R500

– Contacts:

Mnr Walter Meyer / Dr Elise Venter

e-mail: s2a3@up.ac.za

www: <http://s2a3.up.ac.za/>

What is the S₂A₃?

The S₂A₃ aims to stimulate a broad public interest in science and its applications, research, discoveries, history, ethics and philosophy. To do so, the S₂A₃ arranges regular meetings, with speakers who are both entertaining and knowledgeable, as well as field trips, excursions and other interesting events.

Being added to our **e-mail address list** is *free*. Anyone wishing to receive S₂A₃ announcements via e-mail but who has difficulty using the listserver service, is welcome to send their address to: **owner-s2a3_announce@kendy.up.ac.za**

S₂A₃ Website & Listserver

Visit our **website** at <http://s2a3.up.ac.za>. Any comments or suggestions are welcome.

By subscribing to the S₂A₃ **Listserver** you will be notified via e-mail of forthcoming popular scientific lectures and other events of interest presented by the S₂A₃. See <http://s2a3.up.ac.za/> for more details.

To join this list, send an e-mail message to **majordomo@kendy.up.ac.za**, with the following command in the body of your message:

subscribe s2a3_announce <your e-mail address>

The listserver will respond with a message checking the validity of your e-mail address. Please follow the instructions in that message to complete your subscription. If you have difficulty in subscribing or unsubscribing from this list, or you have questions about the list itself, you may contact the list owner at: **owner-s2a3_announce@kendy.up.ac.za**.

Contributions to this newsletter

will be greatly appreciated. Please forward any news (in electronic format please – and less than 200 words) which might be of interest to members, whether scientific, professional or personal, to Walter Meyer **wmeyer@postino.up.ac.za**.

Members are also strongly encouraged to make suggestions for potentially interesting speakers for our monthly talks.

Pretoria Branch S₂A₃ News

June 2004

A newsletter of the Pretoria Branch of the Southern Africa Association for the Advancement of Science

Our forthcoming talk: *(Please note the deviation from our usual day and time.)*

Date: **Tuesday, 8th June 2004**

Time: **Venus transit:** 7:15 to 13:26
Talk: 18h00 (to 19h00)

Due to limited seating, please confirm attendance of talk as soon as possible with Altha du Preez at 420 3767. Please mention S2A3 membership for free admittance.

Venue: **Discovery Centre, University of Pretoria Main Campus**
(Use the Prospect Street Entrance to the campus. The Discovery Centre is in the large white building on the right of the road approx 100 m from the Prospect Street Entrance.)

Speaker: **Louis Barendse**
Big Skies Astronomy

Topic: **Venus, morning and evening star**

Refreshments will be served after the talk.

Talk summary: The 2004 transit of Venus

On 8 June 2004 the planet Venus will move as a black dot across the face of the Sun. No living human being has seen this rare event. It last happened in 1882. The next transition will be in 2012. From our viewpoint in Pretoria Venus will start crossing the disk of the Sun at 07:15, SA time. By 10:20 it will be half-way, and all will be over by 13:26. Members of the Astronomical Society will erect telescopes, suitably equipped with filters for safe

viewing of the Sun, on the lawn in front of the Aula (University of Pretoria). Everyone is invited to come and have a look at Venus and the Sun.

To celebrate this event a Venus party will be held at the Discovery Centre@Tuks on 8 June at 18:00. Louis Barendse, well-known radio personality, will give a talk, followed by a cheese-and-wine reception. The title of the talk is: Venus, morning and evening star. It is essential that people interested in attending the party should reserve a seat with Altha du Preez at the Discovery Centre: Tel: 420 3767, e-mail: altha@gold.up.ac.za. It will be free of charge to members of S2A3, but they MUST make an EARLY reservation with Altha, mentioning their S2A3 membership. Others attending will be asked for a donation of R5 per person.

H G Fourcade and the South African origin of photogrammetry

Cornelis Plug, plugc@mweb.co.za

Henry Georges (originally Henri Georges) Fourcade was born in Bordeaux, France, on 8 July 1865. After completing his schooling in 1880, he came to the Cape with his divorced mother and sister that same year and in 1882 passed the examination in land surveying of the University of the Cape of Good Hope. In July that year he was employed in the newly created Department of Forestry in Cape Town under the Frenchman Count M. de Vasselot de Regne, who gave him some training and put him in charge of the Forest Herbarium. Early the next year he was transferred to Knysna and in 1886 was promoted to District Forest Officer there.

Forester and forest surveyor

In February 1889, at the tender age of 23, Fourcade was sent to Natal to advise on the establishment of a Forestry Department in that colony. He soon submitted his *Report on the Natal forests* (Pietermaritzburg, 1889), which contained original information on Cape timbers and valuable recommendations, and was widely praised. After his return to the Cape in May 1890 he became Acting Demarcation Officer for the Midlands Conservancy, with the task of carrying out forest surveys. Only in 1892 did he pass the practical survey examination

set by the Surveyor General's office, and then submitted the necessary trial survey to be formally authorised to practice as a land surveyor in 1894. In carrying out his surveys of the southern Cape forests, in which he was actively engaged from 1891, he built his own beacons and signals of an improved design and set up a trigonometric network that eventually covered 39 000 square kilometers. By 1898 his survey of the coastal districts from north of Mossel Bay eastwards to beyond Plettenberg Bay was nearing completion. It was of such a high standard that it formed a valuable extension of the triangulation of the Cape Colony. He did at least some of the reductions of the observations himself, using rigorous adjustment methods. A few years later, during September 1902 to January 1903, he carried out part of the secondary triangulation of the colony around Alexandria and Albany, and was recognised for the quality of his work.

The discovery of stereophotogrammetry

In June 1892 Fourcade became a member of the South African Philosophical Society and that same year read his first paper before the society, "On the repetition of angles", published in its *Transactions* in 1893. This was followed a few years later by "Notes on the three point or Pothenot's problem" (*Transactions*, 1898). Around this time he began to develop an elementary form of stereoscopic photography to analyse distant topography and on 2 October 1901 read an historic paper, "On a stereoscopic method of photographic surveying" before the South African Philosophical society. It was published in the *Transactions* in 1903 and overseas in *Nature* in 1902. The reading of his paper predated the publication in 1902 of a similar paper by Dr C. Pulfrich of Jena, who is generally credited with discovering the theory of stereophotogrammetry. In his paper Fourcade independently established a theory of three dimensional measurement and gave details of his design of a surveying camera and a measuring stereoscope employing the réseau system of measuring image coordinates. After having these instruments made in England he took stereoscopic photographs from the ends of a 340 m baseline in the vicinity of Signal Hill, Cape Town, in August 1904 and produced a topographic map of Devil's Peak, the first significant application of stereoscopic measurements to topographic surveying in southern Africa and perhaps in the

world, though a similar exercise seems to have been undertaken at the Austrian Military Geographic Institute at about the same time. The next year he read a paper, "On instruments for stereoscopic surveying" before the joint meeting of the British and South African Associations for the Advancement of Science in Cape Town, in which he described the construction and operation of his instruments. He intended to publish a more complete account later, but seems to have lost interest in the subject for the next 20 years.

Early retirement and contributions to botany

Fourcade was promoted to Forest Surveyor in 1902 and transferred to Cape Town. Two years later C.L.H. Max Jurisch retired as Surveyor General of the Cape. Even though Fourcade was a brilliant and senior surveyor in government service he did not get the post, mainly because he was seen as lacking in the tact and interpersonal finesse required for such an important position. Instead, he was allowed to retire with full pension rights in February 1905 (at the age of 39!) and his post abolished. He retired to a secluded existence on his farm Ratel's Bosch (later part of the Lottering State Forest), but in 1913 moved to Witte Els Bosch (now Witelsbos). Here he set up a saw mill and sold wood from his farm, with substantial financial success.

Around 1920 he came out of his self imposed isolation and began to participate more actively in public life, rendering assistance to the Botanical Survey of the Eastern Cape. He had started his private herbarium in 1905, collecting mainly in the districts of George, Knysna, Humansdorp and Uniondale, and became the principal authority on the flora of the region. He described some 34 of the species that he discovered in the *Transactions of the Royal Society of South Africa* in 1932. His excellent *Checklist of the flowering plants of the Divisions of George, Knysna, Humansdorp and Uniondale* was published in 1941 as Memoir No. 20 of the Botanical Survey of South Africa. It listed some 3000 species, including 16 named after him by other botanists.

Further work in photogrammetry

After a visit to Britain in 1925, during which he questioned the way European photogrammetrists approached the problem of aerial surveying, he developed the theory of relative orientation which underlies modern photogrammetric theory and the

design of photogrammetric plotters. His work was published in a series of papers in the *Transactions of the Royal Society of South Africa* during 1926 to 1929. The theory was applied in the design of what he called a Steriogrammeter, a prototype of which was financed by the British War Ministry and which proved his theory in practice. However, again he received little or no international recognition. Returning to the problem a decade later at the age of 75, he designed a simplified stereoprojector. Although it was not produced commercially it was perhaps his greatest invention. He described it in "A projection method of mapping from air photographs", which was published in the *Empire Survey Review* and in the *Transactions of the Royal Society of South Africa* in 1940.

Other interests

Although he was never a farmer, Fourcade had an interest in agriculture. In 1904 he published an article on "Sour soils and their treatment", dealing with drainage, liming and manuring of the soil, in the *Agricultural Journal of the Cape Colony*. Another of his interests was the measurement of rainfall. Thus he designed a special rain gauge to record the direction and inclination of rain. It could also be used to estimate the moisture in the form of fine drops carried by air currents in misty weather. He also published "Some notes on the effects of the incidence of rain on the distribution of rainfall over the surface of unlevel ground" in the *Transactions of the Royal Society of South Africa* in 1942. His other interests included history, geology, archaeology, monetary policy and poetry, and he corresponded with leading scientists in several of these fields. In 1927 he was elected a fellow of the Royal Society of South Africa, and he was an Honorary Vice President of the South African Forestry Association.

Fourcade remained a bachelor and left his entire estate to the University of Cape Town, though his Africana collection was donated to Rhodes University College a year before his death. His collection of plants went to the Bolus Herbarium. In recognition of his contributions to science honorary Doctor of Science degrees were confirmed on him by the University of Cape Town in 1930, and by the University of South Africa (through Rhodes University College) in 1947. He was a man of superior intelligence, great inventive ability, and high principles; a perfectionist; serious, with little sense of

humour; with the charm, wit, and fiery temper of a Frenchman. He died at Humansdorp on 19 January 1948.

What is the S₂A₃?

The S₂A₃ aims to stimulate a broad public interest in science and its applications, research, discoveries, history, ethics and philosophy. To do so, the S₂A₃ arranges regular meetings, with speakers who are both entertaining and knowledgeable, as well as field trips, excursions and other interesting events.

Being added to our e-mail address list is free. Anyone wishing to receive S₂A₃ announcements via e-mail but who has difficulty using the listserv service, is welcome to send their address to: **owner-s2a3_announce@kendy.up.ac.za**

S₂A₃ Website & Listserv

Visit our **website** at <http://s2a3.up.ac.za>. Any comments or suggestions are welcome.

By subscribing to the S₂A₃ **Listserv** you will be notified via e-mail of forthcoming popular scientific lectures and other events of interest presented by the S₂A₃. See <http://s2a3.up.ac.za/> for more details.

To join this list, send an e-mail message to **majordomo@kendy.up.ac.za**, with the following command in the body of your message:

subscribe s2a3_announce <your e-mail address>

The listserv will respond with a message checking the validity of your e-mail address. Please follow the instructions in that message to complete your subscription. If you have difficulty in subscribing or unsubscribing from this list, or you have questions about the list itself, you may contact the list owner at: **owner-s2a3_announce@kendy.up.ac.za**.

Contributions to this newsletter

will be greatly appreciated. Please forward any news (in electronic format please – and less than 200 words) which might be of interest to members, whether scientific, professional or personal, to Walter Meyer **wmeyer@postino.up.ac.za**.

Members are also strongly encouraged to make suggestions for potentially interesting speakers for our monthly talks.

Pretoria Branch S₂A₃ News

October 2004

A newsletter of the Pretoria Branch of the Southern Africa Association for the Advancement of Science

Our forthcoming talk:

Date: Wednesday, 6th October 2004

Time: 17h15 (to 18h15)

Venue: Discovery Centre,
University of Pretoria Main Campus
(Use the Prospect Street Entrance to the campus. The Discovery Centre is in the large white building on the right of the road approx 100 m from the Prospect Street Entrance.)

Speaker: Deryck Yelverton

Topic: Marion Island

Refreshments will be served after the talk.

Talk Summary

There is a jewel in the southern sub-Antarctic oceans where sun, snow, wind, rain and stormy gales occur all in one day on an Isle called Marion. One can see far over plains of short grass, undulating fern-covered hills, volcanoes and high snow capped mountains. Home of the Wandering albatross and gentle Storm petrels. Orcas entertain the base personnel with awesome displays while hunting seals in the rafts of kelp. On a clear crisp morning the champagne sea vitalises the cool Antarctic air with just a hint of saltiness. Breathing just a lungful of that polar elixir adds hours to a person's life.

Hidden away in this remote place are the answers we so badly need to understand our world better. Like a safe, the answers have been locked away, waiting for the right people to open it and learn.

Come and find out what secrets have been discovered and what current research hopes to unveil.

About the speaker:

Deryck and his wife, Elizma spent a total of three years on Marion Island. They are both passionate about the cold, rugged beauty of the Island. Below are some pictures taken by them during their stay. From top to bottom they show the Island, a closer view of the base on the island and an Elephant Seal.



What is the S₂A₃?

The S₂A₃ aims to stimulate a broad public interest in science and its applications, research, discoveries, history, ethics and philosophy. To do so, the S₂A₃ arranges regular meetings, with speakers who are both entertaining and knowledgeable, as well as field trips, excursions and other interesting events.

Being added to our **e-mail address list** is **free**. Anyone wishing to receive S₂A₃ announcements via e-mail but who has difficulty using the listserver service, is welcome to send their address to:
owner-s2a3_announce@kendy.up.ac.za

S2A3 Website & Listserver

Visit our **website** at <http://s2a3.up.ac.za>. Any comments or suggestions are welcome.

By subscribing to the S₂A₃ **Listserver** you will be notified via e-mail of forthcoming popular scientific lectures and other events of interest presented by the S₂A₃. See <http://s2a3.up.ac.za/> for more details.

To join this list, send an e-mail message to **majordomo@kendy.up.ac.za**, with the following command in the body of your message:

subscribe s2a3_announce <your e-mail address>

The listserver will respond with a message checking the validity of your e-mail address. Please follow the instructions in that message to complete your subscription. If you have difficulty in subscribing or unsubscribing from this list, or you have questions about the list itself, you may contact the list owner at:
owner-s2a3_announce@kendy.up.ac.za.

Contributions to this newsletter

will be greatly appreciated. Please forward any news (in electronic format please – and less than 200 words) which might be of interest to members, whether scientific, professional or personal, to Walter Meyer **wmeyer@up.ac.za**.

Members are also strongly encouraged to make suggestions for potentially interesting speakers for our monthly talks.