

## Southern African science in the year 1909 – 100n

Cornelis Plug

The year 1909 was the last full year during which the Cape of Good Hope, Natal, the Orange River Colony and the Transvaal Colony existed as independent states. Relatively few important scientific events took place in southern Africa during this year, or the ninth year of earlier centuries.

### 1609

Captain William Keeling, returning to Britain from a trading mission for the English East India Company, is credited with measuring the magnetic declination at Cape Agulhas this year—only the third such measurement known to have been made on land in South Africa and the first at that particular location. He found the declination to be 0.2°W. Earlier measurements on board Portuguese sailing vessels around the year 1500 had found the declination to be about zero. Subsequent measurements indicated that the declination increased steadily to a maximum value of some 30°W during the latter half of the nineteenth century, as a result of the gradual movement of the earth's magnetic poles.

### 1809

Wilhelm L. von Buchenroder (1782–1846), German-born soldier, farmer, builder and intellectual, who had arrived at the Cape in 1803, wrote 'An account of the earthquake which occurred at the Cape of Good Hope during the month of December 1809'. The paper does not appear to have been published at the time, but years later it appeared in the first issue of the *South African Quarterly Journal* (1829) and in the *Philosophical Magazine* (1831). He described the effects of the shocks in and around Cape Town in detail, including some damage to buildings, and cracks in the ground near Blouberg.

### 1909

#### Magnetic surveys

Three hundred years after Captain Keeling measured the magnetic declination at Cape Agulhas, J. Carruthers Beattie (1866–1946), professor of physics at the South African College, published his *Report of a Magnetic Survey of South Africa* (London, 1909). The survey, the first of its kind in southern Africa, involved measurements of magnetic declination, inclination and field strength at hundreds of stations throughout the subcontinent. Many of the measurements were repeated after a few years to determine

secular variations in the magnetic elements. The project, carried out with the help of John T. Morrison (1863–1944), professor of physics at Victoria College, Stellenbosch, was started in 1898, but most of the work was done during vacations and a year's leave in 1903. Beattie's report presented a detailed description of the instruments and methods, and a thorough analysis of the results.

In 1909 the two investigators were on leave again and decided to extend their magnetic survey. Beattie made measurements between Ceres and Windhoek (November 1908–March 1909) and from Kabwe, Zambia, through central Africa to the Nile (May–September 1909). Morrison meanwhile covered other parts of central Africa. Altogether more than 200 stations were occupied. The results were included in *Land Magnetic Observations, 1905–1910*, published by the Carnegie Institution in 1912, and were discussed by Beattie in several papers.

#### The fight against stock diseases

The Department of Agriculture of the Transvaal Colony convened a Pan African Veterinary Conference this year, chaired by Charles E. Gray (1864–1937), Principal Veterinary Surgeon of the Transvaal. In addition to veterinarians from the southern African territories the conference was attended by delegates from Madagascar and the Belgian Congo (now the DRC). Its main object was to consider means to combat East Coast Fever. At this time Herbert Watkins-Pitchford (1865–1950), Principal Veterinary Officer of Natal, began a classic study of dipping methods to combat the disease. He showed that dipping every three days with a solution containing sodium arsenite greatly reduced the number of brown ticks on animals and hence was a powerful weapon against the disease. His findings were reported in the *Natal Agricultural Journal* (1909, 1910) and the *Agricultural Journal of the Union of South Africa* (1910) and had a great influence on dipping practices in South Africa.

Arnold Theiler (1867–1936), Director of

the Onderstepoort Veterinary Research Laboratory, identified a new parasite in the red blood cells of cattle and named it *Anaplasma marginale*. He also provided the first description of the disease caused by the parasite, naming it anaplasmosis. It is characterised by severe anaemia. The work was published in the *Report of the Government Veterinary Bacteriologist of the Transvaal for 1908/9* and subsequently in the *Transactions of the Royal Society of South Africa* (1910) and the *Journal of Comparative Pathology and Therapeutics* (1910).

In June 1909 Theiler travelled to Uganda to visit Dr David Bruce (1855–1931), who had established the cause of nagana (sleeping sickness) while stationed in Zululand in 1895. Until August they collaborated on identifying a local cattle disease as East Coast Fever, after which Theiler continued his journey to Europe. He attended a conference in the Netherlands, gave a series of lectures there and in England, and visited various institutions in search of suitable additional staff for Onderstepoort. He returned to South Africa late in November.

#### Botanical expeditions

Henry H.W. Pearson (1870–1916), professor of botany at the South African College and honorary keeper of the herbarium at the South African Museum, undertook two extended and successful collecting expeditions with financial support from the Percy Sladen Memorial Trust. His first journey, during November 1908 to June 1909, took him to Namaqualand and through southern Namibia to Lüderitz, from where he travelled by sea to spend the months March to June in southern Angola. He was particularly keen to collect material of the genus *Gnetum* in Angola. His study of this genus showed that its embryology is very similar to that of *Welwitschia* and laid the foundation for a classification of the order of the Gymnosperms to which these two genera belong. On his second expedition, from November 1909 to January 1910, he spent most of his time in the Richtersveld and Kamiesberg. Upon returning to Cape Town he published 'Travels of a botanist in South West Africa' in the *Geographical Journal* (1910). The plants he collected were described by various specialists during the next five years and included many new species.

#### New telescopes at the Transvaal Observatory

The Transvaal Observatory in Johannesburg received a valuable gift in the form of a 250 mm photographic telescope. The donor was Mr John Franklin-Adams (1843–1912), a wealthy British amateur astronomer who had conducted a photo-

graphic survey of the southern sky at the Cape in 1903. He planned to return to South Africa in 1909 to re-photograph the southern sky, but his health prevented him from so doing. Instead he presented his telescope to the Transvaal Observatory, with all the necessary attachments, a building to house it, and an assistant (R.J. Mitchell) to set up the equipment. The instrument came to be known as the Franklin-Adams Star Camera. The survey was completed by R.T.A. Innes (1861–1933), Director of the Observatory, and his staff just before Franklin-Adams died in August 1912.

Meanwhile in April 1909 a deputation appointed by the South African Association for the Advancement of Science (T. Reunert, W. Cullen, R.W. Schumacher and F.C. Dumat), recommended to the government of the Transvaal Colony that a large telescope be acquired for the observatory. At this time, shortly before the formation of the Union of South Africa, Transvaal was in a better financial position than the other colonies and its leaders appear to have been keen to spend the available funds within the colony. Director Innes was asked to state his case at a meeting attended by both General J.C. Smuts and the Minister of Lands, J.B. Rissik. Asked what size telescope he needed and what it would cost, Innes presented a quotation for a refractor with an object lens of 673 mm. Much to his surprise this was immediately accepted. An order was placed with Sir Howard Grubb in Ireland and after many delays the telescope finally became operational in 1925.

#### A small brain drain to Zimbabwe

George N. Blackshaw (B.Sc.), lecturer in chemistry at the Elsenburg School of Agriculture (near Stellenbosch) left in June 1909 to take up the position of chemist in the Analytical Laboratory of the Department of Agriculture in Salisbury (now Harare), Southern Rhodesia. During the next few years he published several articles on agricultural chemistry and in 1924–1925 was president of the Rhodesia Scientific Association. The position he vacated at Elsenburg was filled by David C. Crawford (M.A., B.Sc.) from the Aberdeen Agricultural College in Scotland, who participated in crop and pasture research at Elsenburg for many years.

Another departure was that of Rupert W. Jack (1882–1970), assistant entomologist in the Cape Colony, who also left in the middle of the year to become Government Entomologist (later Chief Entomologist) of Southern Rhodesia—a post he held until his retirement in 1942. His research was mainly on ticks and their

role in the transmission of stock diseases. His place in the Cape Colony was taken by Charles K. Brain (1881–1954), a school teacher who subsequently obtained a doctoral degree in entomology at Manchester. Brain became an authority on scale insects and professor of entomology at the University of Stellenbosch, but in 1927 he too moved to Southern Rhodesia to become the territory's Director of Agriculture.

#### New societies

The Natal Veterinary Medical Association was formed at a meeting on 19 November 1909 in Pietermaritzburg. Its first president was Herbert Watkins-Pitchford. He was re-elected in 1911 and 1913, after which the activities of the association were suspended owing to the effects of World War I. The association had only about 18 members and held just five meetings during its short existence. Its proceedings were reported in the (British) *Veterinary Record*.

At a meeting of the Cape Society of Civil Engineers held on 10 November 1909 it was decided to change its name to the South African Society of Civil Engineers. Also in 1909 the South African Association of Electrical Engineers was founded in Johannesburg. The first number of its *Transactions* appeared in 1910.

In the Orange River Colony, Act 24 of 1909 established the Central Agricultural Society. It was founded on the recommendation of a parliamentary committee appointed after the dissolution of the Bloemfontein Agricultural Society earlier in the year. The new society received a government grant of £2 000 and held annual shows.

#### Some arrivals

John Hewitt (1880–1961), who had been trained as a zoologist in England, arrived in the Transvaal Colony from Sarawak (on the island of Borneo) to take up an appointment as assistant for invertebrates at the Transvaal Museum in Pretoria. During 1909 he identified many snakes for the King William's Town Museum, named the reptiles of the McGregor Museum during a visit to Kimberley, began revising the South African Lacertilia (lizards), and contributed four papers on lizards and frogs to the *Annals of the Transvaal Museum*.

Bernard Price (1877–1948), electrical engineer and inventor, arrived in South Africa as Chief Engineer of the Victoria Falls and Transvaal Power Company, which generated electricity (in the Transvaal, not at the falls) for the Witwatersrand. In 1936 he made a financial donation which enabled the University of the Witwatersrand to establish the

Bernard Price Institute for Geophysical Research. Ten years later he also financed the Bernard Price Foundation (later Institute) for Palaeontological Research.

Max Rindl (1883–1947), who grew up in King William's Town, was awarded the degree Doctor of Engineering by the Technische Hochschule at Charlottenburg, Germany, during the first half of 1909. In July he was appointed professor of chemistry at Grey University College, Bloemfontein, where he remained until his retirement in 1941. He conducted some pioneering studies of South African mineral springs and poisonous plants, was elected a Fellow of the Royal Society of South Africa, and served as president of the South African Association for the Advancement of Science in 1935.

#### Some noteworthy publications

Edward R. Sawyer, director of experimental stations and principal of the Cedara School of Agriculture near Pietermaritzburg, published the first volume of the *Cedara Memoirs on South African Agriculture* (Pietermaritzburg, 1909). It contained six papers by him, dealing with cereals and their cultivation in South Africa. Two further volumes followed in 1911 and 1912 respectively.

Thomas R. Sim (1858–1938), formerly conservator of forests of Natal, published an extensive work entitled *Forest Flora and Forest Resources of Portuguese East Africa* (Aberdeen, 1909). Two years earlier he had produced a similar work on forestry in the Cape Colony. An important report on *The Geology of the Waterberg Tin-fields* (Memoir No. 4, 1909, of the Transvaal Geological Survey) was completed by Herbert Kynaston (1868–1915) and Edward T. Mellor (1868–1940), based mainly on field work carried out by them during the latter half of 1908. The memoir provided a coherent account of the distribution, mode of occurrence, geological relations, and character of the various deposits of tin ore in the Waterberg, which had become an important part of South Africa's base metal industry. The same two authors also published a systematic description of the geology of two portions of the Waterberg district in the *Annals of the Geological Survey* for 1909.

The large number of scientific papers published this year included six contributions to South African palaeontology by Robert Broom (1866–1951) in the *Annals of the South African Museum*. He described, among others, the fossil fishes of the Upper Karoo strata, some new fossil amphibians and reptiles, and his attempt to distinguish various horizons of the fossil vertebrates of the Karoo.