

100 years of chemistry at Rhodes University

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The history of Grahamstown is well documented and two books deal with the history of Rhodes University.^{1,2} Although the Chemistry Department was one of the founding departments, coverage in the official histories is minimal and sometimes inaccurate or misleading. The Rhodes University Centenary is an appropriate time to look back on some of the achievements of the department and some of its graduates over the past 100 years.

The Cory period (1904–1925)

When Rhodes University College was established in 1904, one of the original four staff members to transfer from St Andrew's College was George Cory, who was appointed professor of physics and chemistry. He had come to South Africa in 1891 at the age of 28 with an M.A. from King's College, Cambridge, to take up the post of vice-principal of the Grahamstown Public Udenominational School, the forerunner of Graeme College. After three years there, he was appointed to St Andrew's College, where he prepared boys for the examinations of the University of the Cape of Good Hope (est. 1873). During this time, before the turn of the century, chemistry was developing very rapidly. Although the electron had not yet been 'discovered' and Mendeleev's periodic table was not used in a textbook until 1895, the foundations of organic chemistry and thermodynamics, the theory of valency and the laws of chemical combination, and much descriptive inorganic chemistry, were known to the students of chemistry in the 1890s. Some of the excitement generated by research overseas at this time was conveyed to Grahamstown by George Cory in a series of public lectures: 'Allotropy', 'Coal tar and its products' and 'Phosphorescence, fluorescence and iridescence' were some of the titles. According to contemporary reports, his lectures were always well illustrated by 'clever and brilliant experiments' and he was by all accounts a popular and fascinating presenter.

Professor Cory relinquished the responsibility for the teaching of physics when Alexander Ogg was appointed to the newly created Chair of Physics in 1905. He was, however, for many years, the only lecturer in the Department of Chemistry and Metallurgy (as it had then become). The pages of the 1907 calendar (Fig. 1) give some idea of the enormous teaching load Cory had to carry. In addition, Cory was for many years the Eastern Cape Public Analyst. The phosphate finds of 1919 were analysed by him, but little seemed to have come of the discovery. In 1914, Mr A. Farrow was appointed as lecturer to assist Cory, and was replaced by Mr R.A. Page in 1916. The staff was increased to three in 1924, when Dr J.L.B. Smith joined the Chemistry Department.

For some years chemistry was housed in the old military hospital behind the Drostdy building, but in 1913 a new science block was erected (Fig. 2). This building was shared with other science departments until 1925 and remained the home of the Chemistry Department until 1968.

Student numbers increased slowly at Rhodes. In 1921, there

Chemistry and Metallurgy.

PROFESSOR :

GEO. E. CORY, M.A., F.C.S. (*King's Coll., Cambridge*).
(Late Demonstrator of Chemistry in the University of Cambridge).

The work of this department comprises that involved in the preparation for the following examinations of the Cape University.

- (1) The Intermediate in Chemistry.
- (2) The Science B.A. (both Pass and Honours).
- (3) The First and Second Mining Examinations.

Also—

(4) Training in the methods of technical analysis,—*e.g.*, the analysis of substances in connection with the Foods and Drugs Act ;—the object of which is to enable those students, who have finished the usual Academical Course, to gain such experience in the analysis of breads, waters, milks, etc., as shall enable them eventually to take up the profession of analytical chemists under this Government or elsewhere.

5. Original research.

Adequate accommodation and equipment is to be found in the laboratory for carrying out efficiently the above branches of work.

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Fig. 1. A page of the 1907 calendar of Rhodes University College.

were eight third-year chemistry students, one of them being Professor Cory's daughter, Dulcie. A similar number of third-year students appear in the 1924 photograph of chemistry staff and senior students (Fig. 3).

Although Cory served the Chemistry Department with great dedication, he is remembered more for his writings on South African history. This interest was aroused in 1893 while he was recuperating from an illness in one of the old Drostdy buildings. He found a number of documents relating to the 1820 Settlers and felt that the history of that time had to be written down before the 'evidence' was lost. He spent vacation after vacation tramping the veld in search of such evidence from African chiefs, farmers and aged settlers (Fig. 4). This dedication eventually

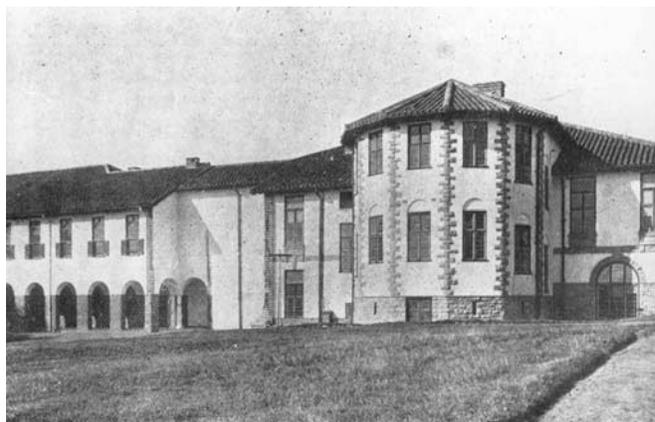


Fig. 2. The new science block erected in 1913.

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Fig. 3. Chemistry staff and senior students in 1924.

resulted in six volumes of 'The Rise of South Africa' and a knighthood in 1920.

Professor Sir George Cory retired from the Chair of Chemistry at Rhodes University College in 1925 at the age of 62 and took up an appointment as honorary archivist at the South African Archives in Cape Town. He died ten years later as the 6th volume of 'The Rise of South Africa' was nearing completion.

The Barker period (1925–1961)

At the time of Cory's retirement, chemistry was entering another period of rapid change and growth in the aftermath of the First World War. Chemical industry was expanding in Europe and North America, and discoveries in atomic physics were leading to a completely new approach to the theoretical basis of chemistry. A man in touch with the latest trends was required to give the Rhodes Chemistry Department new direction for growth. The person chosen for this task, William Francis Barker (affectionately remembered as 'Billy'), was appointed to succeed Cory in June 1925. Barker was only 24 when appointed,



Fig. 4. Professor Sir George Cory fully-equipped for an historical expedition.

but his excellent academic and research record showed that he had the necessary ability and energy. He had obtained a B.Sc. from the University of Liverpool, with first-class honours in chemistry, at the age of nineteen and had gone on to a Ph.D. two years later, working under Professor E.C.C. Baly, FRS, on photochemical reactions. He had continued as chief research assistant to Baly until he took up an appointment as lecturer in chemistry at the University of Cape Town (UCT) in 1924.

Soon after his arrival in Grahamstown, Barker set about reorganizing the department. At this stage chemistry shared rather cramped quarters with zoology in the relatively new building which had been erected for chemistry in 1913. However, zoology soon moved to other temporary accommodation and the task of refurbishing and equipping the building was undertaken. An important feature of Barker's period as head of the department was the excellent teamwork which developed within it. Many of the young people who played important roles in the building up of the department went on to assume leading positions elsewhere.

In 1925, the academic staff consisted of the professor and two lecturers. J.L.B. Smith, who had been appointed under Cory, was an excellent teacher and guided many of the early postgraduate students in their research projects. Many chemists will remember his laboratory textbooks: *A System of Qualitative Inorganic Analysis* and *A Simplified System of Organic Identification*, as well as *Exercises in Organic Chemistry* written in collaboration with Professor Rindle. Smith served the department for twenty-four years until, in 1947, he left to become research professor of ichthyology, in which field he achieved world renown.

L.M. Dugmore joined the lecturing team in 1926, replacing R.A. Page, who had left during the previous year. 'L.M.', as he was known, was the first Old Rhodian member of the chemistry staff, having graduated in 1922. In 1931 he was appointed to a senior teaching post at Queen's College, Queenstown, and later became headmaster of Kimberley Boys' High School.

Professor Barker did much to foster the postgraduate and research output of the department (see Fig. 5). For some years he continued his interest in photochemistry, as evidenced by his research publications in this period and the titles of some M.Sc. theses submitted. In the post-Depression years of the early 1930s, financial support for academic research was not readily forthcoming, but Barker sought out avenues of research which could be of economic importance in the Eastern Province and which would earn the support of local industry. Research into various aspects of leather tanning led to the formation, in 1938, of the Department of Tanning, Hides and Skins Research. This



Fig. 5. Professor Barker and his research students in 1936. Back row: E.T. Verdier, A.J. Carter, N.G. Shirley, W.A. Savage, G. Robertson. Front row: S.G. Shuttleworth, Professor W.F. Barker, P.H. Kitto.

later became the Leather Industries Research Institute (LIRI), the prototype of the many university-based research institutes in South Africa. One of the first students to do research in this field was E.F.C.H. Röhwer (M.Sc. 1935: 'Conductometric analysis of leather extracts and tanning liquors'). In the early forties, after completing a higher degree overseas, Dr Röhwer returned to Rhodes as a member of staff. He later became professor of inorganic chemistry at the University of Stellenbosch. Another M.Sc. thesis submitted in 1935, 'The determination of nitrogen in leather', was by Stanley Shuttleworth, who later became the first director of LIRI. He was also the first Rhodes student to be awarded the Ph.D. degree. Another prominent graduate of this period was David Roux, who, after some years at LIRI, became professor of organic chemistry at the University of the Orange Free State in Bloemfontein and an international authority on the chemistry of flavanoids, the building blocks of condensed tannins.

Other research projects initiated by Barker were associated with the agriculture of the region. Attention was given to soil chemistry and, in conjunction with the Botany Department, a group was set up to study the 'Mineral status of soils and plants in the Eastern Province and Border area'. A postgraduate student who became involved in the electrochemical analysis of soils was Edgar Verdier, who completed his M.Sc. in 1935. He went to Czechoslovakia to continue his polarographic studies under Heyrovsky (who later became a Nobel laureate) but moved to Paris shortly before the Nazi occupation of Czechoslovakia, and obtained his doctorate at the Sorbonne (1943). After the German occupation of France, he became involved in the French Resistance. He returned to Rhodes after the war, serving as lecturer and then senior lecturer in inorganic chemistry. He moved in 1957 to Pietermaritzburg as professor and in 1959 left that post to become secretary of the Organisation for Scientific Cooperation South of the Sahara, based in the Belgian Congo. When war broke out there, he returned to France and later became professor of electrochemistry at the University of Montpellier.

Willem Steyn was awarded his M.Sc. in 1945 for his research on soil analysis and then lectured in analytical chemistry and soil science. In collaboration with the Botany Department he studied the importance of trace metals in citrus and pineapple production and was awarded a Ph.D. in 1958. In 1962 he was appointed professor of inorganic chemistry at UNISA.

In 1951, the South African Wool Textile Research Institute was established on the Rhodes campus, adjacent to the Leather Industries Research Institute. The history of its problematic growth, its incorporation into the CSIR and its eventual move to Port Elizabeth in 1967 have been described by Kingwill.³

Later to become better known as a physicist, Jack Gledhill completed his M.Sc. in chemistry, with distinction, at Rhodes in 1943 and received a Ph.D. in physics in 1947 for his ionospheric research in the Rhodes Physics Department. He then continued his master's degree interest in electrochemical conductance under the Nobelist, Lars Onsager, at Yale University and was awarded a Ph.D. in 1949. He became a lecturer in the Rhodes Chemistry Department in 1949 and was later promoted to senior lecturer. He and P.K. Faure (later professor of inorganic chemistry at Rand Afrikaans University, Johannesburg) built up a strong group working on conductometric chemistry. Among the many graduates from this group was Desmond Goddard (M.Sc. 1948), who was then awarded an Elsie Ballot scholarship to Cambridge University, where he obtained his Ph.D. in surface chemistry in 1951. He pursued a distinguished career in industry, chiefly with Unilever in New Jersey, and later with Union Carbide in

Westchester, New York, and spearheaded their research programmes on surfactants and polymers until his retirement in 1992. Other researchers in this productive electrochemical conductance group were A. Faure (Ph.D. 1953), G.M. Malan (Ph.D. 1953), M.E. Dry (M.Sc. 1954), N.P. Finkelstein (M.Sc. 1957) and D.R. Rosseinsky (M.Sc. 1958). In 1954, Jack Gledhill was appointed professor of physics (later physics and electronics) at Rhodes.

H. Govinden came to Rhodes from the University of Fort Hare in 1953 to do the honours course in chemistry. He then continued with electrochemical research (Ph.D. 1962) and later became professor of physical chemistry at the University of Durban-Westville.

In the years after the Second World War, the Chemistry Department grew rapidly and an enormous load was carried by the small teaching staff. This affected Professor Barker's health and, together with other considerations, led him to retire in 1961 after serving Rhodes for more than thirty-six years. During his time, he had also played a large part in the establishment of a Pharmacy Department at Rhodes.

Bill Campbell, George McGillivray, Arthur Howard, Gus Gerrans and Gordon Cragg were among the excellent organic chemistry graduates from Barker's department who went on to eminent academic careers (Campbell and Cragg at UCT, McGillivray at UNISA, Howard and Gerrans at the University of the Witwatersrand). Cragg later became director at the U.S. National Cancer Institute in Washington, D.C. Len Dry followed an industrial career at Sasol and Mintek.

In 1956, Dr E.G. Prout joined the department as senior lecturer after spending some time at the Atomic Energy Research Establishment at Harwell, England. He soon built up a strong research group in solid-state chemistry, with special interest in the effects of radiation on solids. One of the few widely used theoretical models for solid-state reactions has been named after Prout and Tompkins. Professor Tompkins, FRS, was originally Prout's research supervisor at the University of Natal, before moving to Imperial College, London. One of Prout's Ph.D. students, Patrick Herley, obtained an 1851 Scholarship to do a second Ph.D. with Tompkins at Imperial College. Later, Herley moved to the Brookhaven National Laboratories and, in 1971, obtained a dual appointment as professor of chemistry and of materials science and engineering at the State University of New York at Stony Brook, which he held until his untimely death in 2000. Michael Sole, another graduate from Prout's research group (M.Sc. 1959), later did research for the South African Atomic Energy Board, before starting his own electro-forming business.

A period of rapid change (1962–1965)

When Barker retired at the end of 1961, a second chair of chemistry was created and Ernest G. Prout was promoted from senior lecturer to professor of physical chemistry. John R. Nunn, at that time head of the Organic Chemistry Division of the National Chemical Research Laboratory of the CSIR, was appointed professor of organic chemistry. The position of head of department was to alternate at three-year intervals. During this reconstitution of the department, Dr D.E.A. Rivett, one of J.L.B. Smith's M.Sc. students, replaced Dr George Little (1949–1961) as senior lecturer in organic chemistry, from his post as research chemist at Agricura Laboratoria.

The early 1960s were largely occupied with the detailed planning of a new building for the department. This building was designed by the architects, Pearse, Aneck, Hahn and Bristol (who had gained valuable experience from their design of the recently completed chemistry building at Wits) to provide the



Fig. 6. The chemistry building shortly after its opening in 1969.

much-needed space for the large classes, which included pharmacists who, at that stage, did a BSc degree with both pharmacy and chemistry as major subjects. Building began in 1966 on the site which had been occupied by the Vice-Chancellor's Lodge and was completed in 1968. The building, with its spacious foyer, attractive but functional lecture theatres, light and airy passages and well-fitted research and teaching laboratories, is a tribute to the architects and to the hard work and thoughtfulness of Nunn and Prout and the staff of the department at that time (Fig. 6). The three speakers at the opening ceremony in 1969 are shown in Fig. 7.

In 1966, before completion of the new building, Prout left Rhodes to take up the chair of physical chemistry at the University of Cape Town. His move to UCT was followed by those of Drs L.R. Nassimbeni and D.A. Thornton, both of whom had lectured at Rhodes for several years. Nassimbeni, now professor of crystallography at UCT, started his work on X-ray diffraction under Prout at Rhodes. Thornton lectured for a while in the Medical School at UCT before being appointed professor of inorganic chemistry. Dr W.J. McGill, later to become professor of polymer science at the University of Port Elizabeth, and J.T.H. Roos, later senior chemistry master at St Andrew's College, Grahamstown, were also lecturers in the department during this period.

The Nunn/Glasser period (1966–1980)

Leslie Glasser, from the University of the Witwatersrand, succeeded Prout in 1966. Research in the department continued to flourish under the direction of both Nunn and Glasser. Much modern equipment was obtained and could be housed and used, under ideal conditions, in the new building. One of the major acquisitions was a large computer-controlled mass spectrometer, which enabled Nunn, together with Mrs A.J. Nunn, as research associate, to develop and apply very sensitive methods for the detection of carcinogenic nitrosamines in food plants used by rural communities in the Transkei. These results aroused considerable international interest.

Another acquisition, with funding from the university and the CSIR, was some basic equipment for thermal analysis. Research in this area was to become one of the main themes in the department and the equipment was updated with generous support from AECI Explosives Ltd in the 1980s.

After some years at the National Chemical Research Laboratory of the CSIR, Dr J.R. Parrish joined the department in 1970. He provided much-needed expertise in the teaching of analytical



Fig. 7. The three speakers at the official opening of the new chemistry building in March 1969: (l to r) Dr J.M. Hyslop (vice-chancellor), Dr S.M. Naudé (president of the CSIR) and Professor J.R. Nunn (head of department).

chemistry and a strong research interest in the important fields of ion-exchange resins and chromatography. Another recruit from the CSIR was Dr N.H. Agnew, who put tremendous effort into the teaching of inorganic chemistry, some of his innovations even featuring on the cover of the *Journal of Chemical Education*. Agnew emigrated to Australia in 1977, became involved in museums as scientific curator, and later moved to the Getty Institute in Los Angeles, California.

The South African Chemical Institute held its national convention in Grahamstown for the first time in 1971, when the new chemistry building was on display to the chemical community (Fig. 8).

During the late 1970s, major courses in applied chemistry and biochemistry were introduced. The former lasted only a few years, but biochemistry later blossomed into a separate department.

Among the many pharmacy students who were attracted to do postgraduate research in the active organic chemistry group, either in carbohydrate chemistry with Nunn, or in natural product chemistry with Rivett, was H. Parolis (Ph.D. 1968), who lectured in organic chemistry and later became professor of pharmaceutical chemistry at Rhodes.

Dr M.E. Brown (1967–2003) and Mr C.A.R. Phillpotts (1965–1979), both former students of Prout, together with Dr G. Brink (1971–1980), contributed to the teaching and research in physical chemistry. Dr J.R. Moss, originally from the universities of Leeds and Bristol, also made strong contributions in research and in the teaching of inorganic chemistry before moving to the University of Cape Town in 1979.

The years 1979 and 1980 proved to be another period of rapid change in the department. Glasser was appointed to the Chair of Physical Chemistry at the University of the Witwatersrand and his move was followed by those of Brink (also to Wits) and Phillpotts (to become involved with computers at the Weather Bureau in Pretoria).

During his time at Rhodes, Glasser was actively involved in research on dielectric properties of solids, molecular association in solution with Brink, and solid-state reactions with Brown. He also developed several ties with research institutes and the chemical industry. Both he and Nunn played active roles in the university, serving on numerous committees, and both served terms as dean of science.

The Letcher period (1981–1991)

Professor Trevor M. Letcher succeeded Glasser and became head of department after Nunn's retirement in 1980. Under his

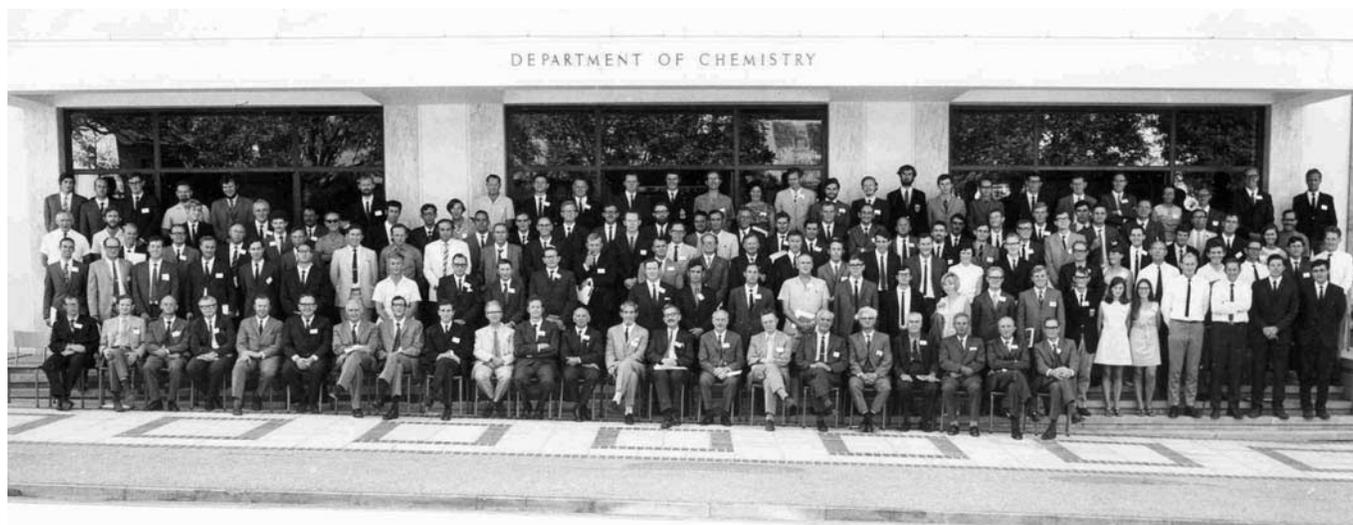


Fig. 8. Delegates to the 21st National Convention of the SA Chemical Institute, 1971, in front of the new chemistry building.

enthusiastic leadership a number of new appointments were made. Dr D.J. Eve, who had completed an M.Sc. in 1955 with a thesis on trace element analysis under the direction of Verdier and Steyn and a Ph.D. from Rhodes in 1961 for work on the spectrographic determination of trace metals while a senior research officer at the CSIR, was appointed in 1980 from the then University of Rhodesia.

Dr R.C. Cosser, also from the University of Rhodesia/Zimbabwe, with a Ph.D. and DIC from Imperial College, London, and research experience at the University of Liverpool with Professor (now Sir) David King, was appointed senior lecturer in physical chemistry in 1981. Dr K.J. Buchanan, a graduate of the University of Port Elizabeth with valuable expertise in polymer chemistry, joined the department after completing post-doctoral studies in Canada.

Dr C.G. Whiteley, a graduate of the University of Natal, joined the department as lecturer in organic chemistry in 1979 and soon began to build up the optional courses in chemistry for biologists into full courses in biochemistry; in 1984, Dr John Duncan, another Natal graduate, was appointed as head of biochemistry in the renamed Department of Chemistry and Biochemistry. The appointment in 1986 of another lecturer, Dr Santy Daya, with an M.Sc. from Rhodes and a Ph.D. from MEDUNSA, considerably strengthened biochemistry, which in 1990 formed a combined department with microbiology.

In 1981 Dr Rivett was promoted to professor of organic chemistry. In addition to being well known for his research on natural product chemistry, Rivett was very active in the affairs of the SA Chemical Institute, both regionally and nationally, as editor of the institute's journal and as its president in 1978/79. He also became famous for his chemistry magic show, which continues to enthrall audiences of all ages.

In 1982 Michael Beck received one of the first CSIR–industrial partnership bursaries to do his Ph.D. on the pyrotechnic delay fuses used in mining explosives and produced by AECI Explosives Ltd. This was the start of a long association of AECI Explosives with the department that resulted in many graduates and publications.

Dr Robin English was appointed senior lecturer in 1984. He had studied at the universities of Cambridge and Cape Town and had taught science in Peru for several years before coming to Rhodes from a post at UNISA. His expertise in X-ray crystallography was extremely valuable and his untimely death in 1994, at the age of 45, was a great loss to the department. His father,

Major English, had taught applied mathematics at Rhodes for many years.

In 1986, Michael Brown, at that time dean of science, was promoted to a personal Chair in Physical Chemistry.

In 1987, extra floors were added to the chemistry building; and the flat roof, which had been much criticized during the intervening years for not conforming to the general architecture of the other buildings on campus and which also leaked severely during heavy rain, was replaced by a more conventional pitched red-tile roof. The Department of Pharmaceutical Sciences moved from their cramped and remote quarters beyond LIRI into the enlarged building and took over some of the existing laboratories on the lower floors. Professor Parolis's carbohydrate research group, which complemented that of Nunn and attracted many students for higher degrees, then had more ready access to the advanced NMR and mass spectrometry equipment in the building, operated jointly by chemistry and pharmacy as East Cape Regional facilities. This collaboration was continued by Parolis's successor, Professor Beverley Glass, whose research on the photostability of drugs was an attractive area for chemistry postgraduates. In collaboration with Brown, some comprehensive studies of both thermal and photostabilities of drugs have been published, even after Glass's emigration to Australia in 2001.

When Professor Rivett retired in 1986, after 25 years of distinguished service to the university and the department, Professor Perry T. Kaye was appointed to the Chair of Organic Chemistry and soon established a productive, broadly-based organic research programme.

Twenty years after its first visit, the national convention of the SA Chemical Institute returned to Grahamstown in 1991 (Fig. 9).

The Kaye period (1992–present)

When Letcher accepted a chair at the University of Natal, Durban, in 1992, Kaye became head of department and Dr Tebello Nyokong, originally from the University of Lesotho and with extensive postgraduate experience in Canada, was appointed to the resulting vacancy as senior lecturer in inorganic/physical chemistry. She quickly established a flourishing research group in photochemistry, photodynamic cancer therapy and electrochemistry. Personal promotions to associate professor and then professor soon followed.

Associate Professor Eve retired at the end of 1995. In addition to the expertise that he supplied in analytical and coordination



Fig. 9. Delegates to the 31st National Convention of the SA Chemical Institute, 1991.

chemistry, he served for many years as president of the Old Rhodian Union, and both he and Emeritus Professor Rivett continue to play very active roles in the department.

Dr Gary Watkins, a former student of Thornton's, replaced Eve in 1996, coming to Rhodes from a post at UCT. He has established a research programme in inorganic and coordination chemistry and was promoted to senior lecturer in 2002. He has also been very active in promoting chemistry at the annual Sasol SciFests.

Dr Cheryl Sacht, one of the few graduates from the Department of Analytical Sciences at UCT, was appointed lecturer in inorganic/analytical chemistry in 1995. An active researcher, she was promoted to senior lecturer in 1999, but later emigrated to the U.K. The resulting vacancy was filled by Dr David Maree, a Ph.D. graduate from Professor Nyokong's research group, who has been responsible for installing and commissioning sophisticated laser equipment provided by the National Laser Centre. His wife Suzanne is a Ph.D. graduate from the same research group.

Dr Michael Davies-Coleman, a Ph.D. graduate of Rivett's, spent a short while as lecturer in the School of Pharmaceutical Sciences before being appointed senior lecturer in organic chemistry in 1995. He succeeded Dr J.R. Liddell and has developed a strong research group in marine natural products with major international collaborations. He was promoted to associate professor in 1998 and to full professor in 2002.

Since the establishment of the Vice-Chancellor's Distinguished Awards for Teaching and for Research, members of the department have featured prominently in the receipt of these honours. Professor Kaye received the teaching award in 1994 and the senior research award in 2001. Professor Brown received the senior research award in 1998, Professor Davies-Coleman, the award for researchers under 45 years old, in 1996 and Professor Nyokong the senior award in 2003. Other major honours have been the Mettler/NATAS Award for Thermal Analysis (1996) and the SACI Gold Medal (2000) to Brown, who was A-rated by the National Research Foundation in 2002. The AECI medal was awarded to Kaye in 2002.

In 1993, the first Rhodes D.Sc. in chemistry was awarded to Ray Davidson (M.Sc. 1959, Ph.D. 1968) for his published papers and patents on the extraction of gold by adsorption on activated carbon. Daughter Debbie (Ph.D. 1992) is married to Steve Taylor (also Ph.D. 1992), making them the first Rhodes chemistry doctorate couple!

In 1997 the large first-year laboratory in the department was named the John Nunn Laboratory and Mrs Avril Nunn, his widow, was able to be present at the ceremony.

In 2002 the long and productive collaboration (1971 to date) of Professor Brown with Dr Andrew Galwey of the Queen's University of Belfast was marked by the publication of a special issue (volume 388) of the international journal, *Thermochimica Acta*.

Chemistry has always been a difficult subject for some students, particularly for those who may never have had a qualified science teacher at school. This had long been of concern to the department and a unique remedial scheme was introduced in 1993. Students who do not perform adequately in the mid-year exams in Chemistry I, but still show some potential, are transferred to a remedial stream (Chemistry IR), where the first semester's work is repeated in a largely tutorial-based fashion. Those who pass this remedial semester are then given further preparation in the following semester before being re-admitted to the second semester of the normal Chemistry I course, thus taking two years to obtain credit in Chemistry I. Mrs Joyce Sewry was appointed as a special academic development lecturer in charge of this programme.

In an attempt to expose students to the 'real world' of chemistry, entrepreneurial projects have been introduced for Chemistry II students and industrial projects for Chemistry III students. The Chemistry II students are divided into teams and required to make an assigned product, such as a soap, a polish, paint, etc., and investigate all aspects from production to marketing. The launching of these products has become an entertaining highlight of the year. In Chemistry III, similar teams of students undertake a theoretical study of the large-scale production of a marketable chemical and present their proposals to a 'Board of Directors'. For several years, Tino van der Zeyde, a retired chemical engineer, lectured and advised the class on these projects. The Anglo American Chairman's Fund Educational Trust provided valuable sponsorship of prizes for the winning teams and other expenses.

Technical and support staff

Research and teaching in a chemistry department can only flourish with expert technical assistance, something which the Rhodes Chemistry Department has been fortunate to enjoy over the years. Ferdy van der Water was the first full-time glass-blower in the department, and was renowned for his high-vacuum systems with hand-ground taps and joints. He was succeeded in 1964 by Stan Harris, who was later part of the group that moved to Cape Town in 1966. He was followed by John Murray, who in a quiet and efficient way met the needs of researchers until his retirement in 1988. André Adriaan, his

erstwhile apprentice, succeeded him and regularly entertains visitors to Sasol SciFest with his artistic glass-blowing skills.

The departmental workshop was under the control of Friedl Ranftelshöfer, a skilled cabinet maker, from 1961 to his retirement in 1996, during which time many items of equipment were constructed or adapted under his supervision. On his retirement, both glass-blowing and maintenance workshops were placed under Adriaan's control and, with the able assistance of Reuben Douglas, the high quality of service continues.

Aubrey Sonemann also joined the department in 1961 and, in achieving his present position of chief technical officer, has accumulated invaluable expertise in a wide variety of techniques and instruments. The life-times of many pieces of irreplaceable equipment have been extended by his skill and perseverance, with the assistance of Johan Fourie.

General supervision of the first-year laboratory over a number of years has been the task of Harry Mcuba, now senior technical officer.

The storeman is an important position in any chemistry department. Many Old Rhodians will remember the multi-functional role played by Cuthy Randell for over 35 years before retiring in 1981. In addition to being storeman, he was a skilled, self-taught glassblower and he also assisted Professor Barker with lecture demonstrations. The current storeman, Johann Buys, joined the department in 1992 with extensive experience in the motor-spares industry, and is responsible for a very efficient, computer-based store.

The departmental secretary is also a pivotal position. Notable (long-serving and long-suffering) secretaries have included S. Bullock during the Prout–Nunn era, Pat Estment, who succeeded her and ran the department from behind the last of the typewriters, Margie Kent, and the current secretary, Benita Tarr, who has brought the secretarial duties into the age of word-processing.

Conclusions

Examination of the record of the Chemistry Department at Rhodes, since its establishment 100 years ago, shows that its influence on chemistry in South Africa and beyond has been far greater than would be expected for such a small department. Its graduates have been internationally recognized and sought after and have played significant roles in academia, industry and elsewhere. Staff members have been welcomed at international conferences and warmly hosted during periods of sabbatical leave overseas.

The department has performed well in both the main functions of teaching and research. Research, fuelled by the increase in funding available from the National Research Foundation and other bodies, continues to flourish in the present, considerably more competitive environment; the numbers of published papers in international journals and of quality higher-degree graduates continue to increase (see Fig. 10 and the Appendix). Collaborations spread across the globe and students are being attracted to the department for postgraduate studies from countries to the north and across the continents.

1. Currey R.F. (1970). *Rhodes University 1904–1970: a chronicle*. Rhodes University, Grahamstown.
2. Buckland R. and Neville T. (2004). *A Story of Rhodes: Rhodes University 1904–2004*. Macmillan, Johannesburg.
3. Kingwill D.G. (1990). In *The CSIR – the First 40 Years*, pp. 221–228. CSIR, Pretoria.

Appendix 1

List of M.Sc. and Ph.D. graduates 1924–2003

Inggs A.R. (1924 M.Sc.). The interaction of aniline and chloroform: The thiazole carboxylic acids.

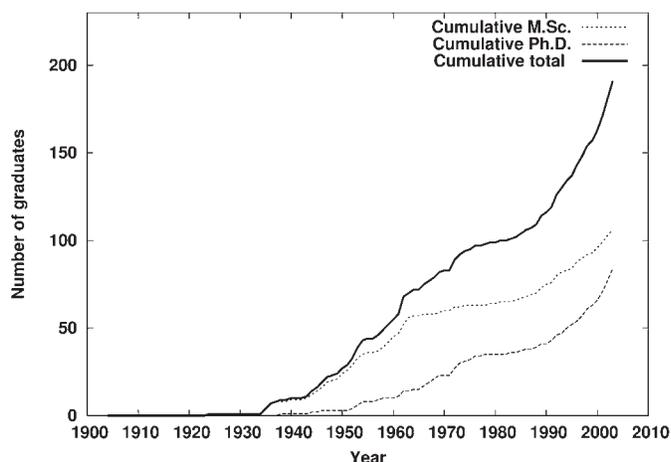


Fig. 10. Production of M.Sc. and Ph.D. graduates by the Department of Chemistry, Rhodes University.

Rohwer E.F.C.H. (1935 M.Sc.). On the conductimetric analysis of leather extracts and tanning liquors.

Shuttleworth S.G. (1935 M.Sc.). The determination of nitrogen in leather, the quality of South African vegetable sole leather.

Verdier E.T. (1935 M.Sc.). The antimony electrode.

Kitto W.H. (M.Sc. 1936). A study of the applicability of rapid methods to the chemical analysis of water supplies.

Savage W.H.D. (1936 M.Sc.). Catalysis and coal hydrogenation with special reference to two South African coals.

Shirley N.G. (1936 M.Sc.). The electro dialysis of soils: a critical investigation of its availability for the determination of exchangeable bases as compared with neutral salt solution extraction methods.

Carter A.J. (1937 M.Sc.). A polarographic study: the estimation of sodium and potassium in the presence of each other.

Shuttleworth S.G. (1938 Ph.D.). A study of problems connected with the leather and allied industries of South Africa.

Gray D.J.S. (1940 M.Sc.). The determination of selenium and tellurium in blister copper and copper concentrates.

Gledhill J.A. (1943 M.Sc.). An investigation of some problems involved in increasing the accuracy of conductometric titrations.

Corbett J.H. (1944 M.Sc.). A preliminary investigation of the chemical nature of wattle tannin.

Rivett D.E.A. (1944 M.Sc.). An investigation of the essential oil of *Agathosma apiculata* Meyer.

Sapiro M.L. (1944 Ph.D.). Studies in the essential oils and alkaloids of certain South African plants.

Roux D.G. (1945 M.Sc.). An investigation of the essential oil of *Agathosma gnidioides* Schlechter.

Steyn W.J.A. (1945 M.Sc.). A study of the errors involved in the sampling of soils.

Pienaar D.J. (1946 M.Sc.). Base exchange in soils: a study of the reproducibility of base exchange values for some South African soils, as indicated by leaching with normal ammonium acetate solution.

Silk M.H. (1946 M.Sc.). The high pressure catalytic hydrogenation of the tannin of black wattle (*Acacia mollissima* Willd).

Kritzinger C.C. (1946 Ph.D.). The presentation and standardisation of South African hides and skins.

Festenstein G.N. (1947 M.Sc.). A preliminary investigation of the determination of ionic mobilities by conductometric titration.

Heugh R.A. (1947 M.Sc.). The oxidation and degradation products of black wattle tannin (*Acacia mollissima*).

Lowitt H. (1947 M.Sc.). Methylation and acetylation of polyhydroxy compounds and parallel results obtained with wattle tannin.

Goddard E.D. (1948 M.Sc.). The contribution of a precision conductance bridge and its application to a study of chromium sulphate complexes.

Simesy J.E. (1949 M.Sc.). A critical evaluation of the analytical methods used for the separation and estimation of copper and nickel.

Burley R.W. (1950 M.Sc.). An investigation of certain complex ions of trivalent chromium by spectrophotometric and other physical methods.

Dry L.J. (1950 M.Sc.). A preliminary investigation of the toxic principle of *Moraea polystachya* Ker.

Impey N.R.M. (1950 M.Sc.). The anodic oxidation of calcium lactate: an estimation of the products of electrolysis and an investigation into some of the problems involved.

Glueck L.D. (1951 M.Sc.). A preliminary investigation of the structure of green wattle tannin (*Acacia decurrens* Willd).

Ryding W.W. (1951 M.Sc.). Attempted synthesis of a β - or γ -resorcinol alcohol.

- Du Toit A.A. (1952 M.Sc.). A study of cation exchange in South African soils.
- Friend MT (1952 M.Sc.). Studies in chromium complexes.
- Schauder H. (1952 M.Sc.). Investigation leading to a process for the synthesis of hydrogen sulphide from sulphur and certain lubricating oils derived from petroleum.
- Roux D.G. (1952 Ph.D.). The chemistry of the wattle tannins *Acacia mollissima* Willd., *A. decurrens* Willd., *A. pycnantha* Benth. and *A. dealbata* Link.
- Allison F.S. (1953 M.Sc.). An investigation of the equivalent circuit of a conductivity cell.
- Cooper D.R. (1953 M.Sc.). Studies in chromium complexes: the preparation and properties of amino base derivatives of oxalate chromium(III) complexes.
- Eve A.J. (1953 M.Sc.). The polarographic determination of trace elements in blister and refined copper.
- Waldron R.A.F. (1953 M.Sc.). Aspects of the resorcinol-formaldehyde condensation.
- Faure A. (1953 Ph.D.). Some measurements of the conductivities of dilute potassium chloride solutions.
- Malan G.M. (1953 Ph.D.). Measurements of the solubilities of some silver halides in water by electrical methods.
- Dry M.E. (1954 M.Sc.). The determination of the solubility of mercurous chloride at 25 degrees Celsius.
- Charlson A.J. (1954 Ph.D.). The chemistry of acacia gums.
- Silk M.H. (1954 Ph.D.). The chemistry of naturally occurring long chain unsaturated compounds.
- Eve D.J. (1955 M.Sc.). A critical study of methods for the determination of zinc in soils and plant materials.
- Finkelstein N.P. (1957 M.Sc.). Liquid junction potentials at mixed electrolyte salt bridges.
- Faure P.K. (1957 Ph.D.). A conductometric investigation of phenomena in extremely dilute aqueous solutions.
- O'Sullivan D.J.M. (1958 M.Sc.). Synthetic ion exchange resins incorporating asymmetric groups as resolving agents.
- Rosseinsky D.R. (1958 M.Sc.). The solubility of barium sulphate in water at 25 degree Celsius.
- Steyn W.J.A. (1958 Ph.D.). A statistical study of the errors involved in the sampling and chemical analysis of soils and plants, with particular reference to citrus and pineapples.
- Clur D.A. (1959 M.Sc.). The solubility of mercurous chloride in water at 25°C.
- Davidson R.J. (1959 M.Sc.). The curcumin method for the determination of boron in plant material.
- Sole M.J. (1959 M.Sc.). The thermal decomposition of irradiated silver permanganate.
- Bamford G.R. (1960 M.Sc.). The sorption of hydrochloric acid and potassium hydroxide by mohair and wool.
- Herley P.J. (1960 M.Sc.). The thermal decomposition of silver oxide.
- Williams-Wynn D.E.A. (1960 M.Sc.). Some aspects of the chemistry of zirconium compounds relating to their combination with collagen.
- Ellis M.J. (1961 M.Sc.). Investigation of the formation of complexes between selected organic compounds and the chlorides and sulphates of chromium.
- Gore W.T. (1961 M.Sc.). A critical study of the determination of molybdenum in plant material.
- Eve D.J. (1961 Ph.D.). The spectrochemical determination of certain minor trace elements in plant material.
- Brandt P.J. (1962 M.Sc.). The spectrographic determination of trace elements in citrus leaves.
- Philpotts C.A.R. (1962 M.Sc.). The oxalate complexes of thorium.
- Russell A.E. (1962 M.Sc.). A comparative kinetic study of the reaction between chromium nitrate solutions and the carboxyl groups of acetate and collagen.
- Saayman H.M. (1962 M.Sc.). An investigation of the orientation of certain long-chain fatty acids at the air/water interface.
- Smith A.J.H. (1962 M.Sc.). A critical investigation into the methods of determining sulphur in plant material.
- Govinden H.S. (1962 Ph.D.). The construction of a wide-frequency range double heterodyne conductance bridge and its uses in the investigation of polarisation errors in conductance measurements.
- Herley P.J. (1962 Ph.D.). The thermal decomposition of unirradiated and irradiated permanganates.
- Maihs E.A. (1962 Ph.D.). A comparative study of the catechin components in the barks of wattle species related to *Acacia mearnsii*.
- De Bruyn G.C. (1963 M.Sc.). Guibourtracridin, a new leuco-anthocyanidin from Rhodesian copalwood (*Guibouritia coleosperma*).
- Grove C.C. (1963 M.Sc.). Studies on the emulsion scouring of raw wool.
- Taylor J.D. (1963 M.Sc.). The development of a method for the determination of microgram amounts of magnesium by atomic absorption.
- Woods G.S. (1963 M.Sc.). An X-ray investigation of the thermal decomposition of irradiated and unirradiated silver permanganate.
- Nassimbeni L.R. (1964 M.Sc.). The crystal structure of caesium permanganate by X-ray diffraction.
- Drewes S.E. (1964 Ph.D.). Prototypes of black wattle tannins and their stereochemistry.
- Woolard G.R. (1966 M.Sc.). The constituents of the resin of *Euryops floribundus*.
- Brown M.E. (1966 Ph.D.). A study of irradiation effects in solids.
- Moore D.J. (1966 Ph.D.). The thermal decomposition of mercuric oxalate and inorganic azides.
- Kaplan E.R. (1967 Ph.D.). An examination of the extractives of *Leonotis* species.
- Saayman H.M. (1967 Ph.D.). Synthesis of flavan-3,4-diols, stereochemistry of novel biflavonols and novel non-tannins from *Acacia mearnsii*.
- Davidson R.J. (1968 Ph.D.). The effect of ultraviolet and gamma irradiation on soluble calf-skin collagen.
- Parolis H. (1968 Ph.D.). A structural investigation of the sulphated polysaccharides of *Aeodes orbitosa* and *Phyllomenia cornea*.
- Ilsley A.H. (1969 M.Sc.). Novel components of *Acacia mearnsii*.
- Ryding W.W. (1969 Ph.D.). The growth of flue-cured tobacco in acid soils.
- Williams-Wynn D.E.A. (1969 Ph.D.). Theoretical aspects of the reaction of zirconium compounds and vegetable tannins with the chromium-collagen complex.
- Stokhuyzen R. (1970 M.Sc.). An investigation of the structural problems in relation to some synthetic waxes.
- Chan-Henry R.Y. (1972 M.Sc.). Proton conduction in organic solids.
- Persicaner P.H.R. (1972 M.Sc.). A gas chromatographic study of oils from some *Agathosma* species.
- Eagle G.A. (1972 Ph.D.). Extractives from *Leonotis* and *Euryops* species.
- Farrant A.J. (1972 Ph.D.). A structural investigation of the sulphated polysaccharide of *Pachymenia carnososa*.
- Russell I. (1972 Ph.D.). A structural investigation of the sulphated polysaccharide of *Anathca denta* and the xylan of *Chaetangium erinaceum*.
- Stewart B.V. (1972 Ph.D.). Thermal decomposition of ammonium metavanadate.
- Du Plessis L.S. (1973 Ph.D.). The isolation and estimation of low molecular weight N-nitrosamines in biological materials.
- Philip H.I. (1973 Ph.D.). A physico-chemical investigation of refractory hard metals.
- Slabbert N.P. (1973 Ph.D.). Metal complexes of black wattle tannins and related model polyphenols.
- Kelly F.T. (1974 M.Sc.). A study of the properties and methods of analysis of high molecular weight N-nitrosamines.
- Allsobrook A.J.R. (1974 Ph.D.). A structural investigation of the sulphated polysaccharide from *Aeodes ulvoidea* Schmitz.
- Van der Linde M.J. (1975 Ph.D.). Complexes of carbohydrates with magnesium ions, the isolation of an oligosaccharide containing L-galactose from the polysaccharide of *Aeodes orbitosa*: horizontal cellulose column chromatography of sugars.
- Campbell C. (1976 Ph.D.). A dielectric and spectroscopic study of molecular association in solutions of alcohols.
- Roos J.T.H. (1976 Ph.D.). A study of factors affecting precision in atomic absorption spectrometry.
- McGarvie D. (1978 Ph.D.). The polysaccharides of *Opuntia ficus-indica* (L.) Mill. and *Opuntia aurantiaca* Lindl.
- Hemmes M. (1979 M.Sc.). The study of hydroxyoximes and hydroxamic acids supported on macroporous resins and their use in the rapid separation of metals.
- Bryson M.A.W. (1981 M.Sc.). Separation and characterisation of chromium(3) carboxylate solutions.
- Sparrow N.A. (1983 Ph.D.). Continuous-flow dynamic dialysis and its application to collagen-ligand interactions.
- Hendry A.J. (1984 M.Sc.). Analytical procedures for the determination of wattle polyphenols in wastewaters.
- Hird B. (1985 M.Sc.). The synthesis and properties of some polymer hydrogels.
- Beck M.W. (1985 Ph.D.). Intersolid combustion reactions in pyrotechnic systems.
- Heyward C.K. (1986 M.Sc.). A study of petrol and diesel fuel blends with special reference to their thermodynamic properties and phase equilibria.
- Bryson M.A.W. (1986 Ph.D.). The adsorption of chelating reagents on oxide minerals.
- Hurlow E.L. (1987 M.Sc.). Aspects of the anaerobic digestion of wattle tannins.
- Ramagwede M.H. (1988 M.Sc.). The sulphidization of mineral surfaces as applied to the froth flotation process.
- Davies-Coleman M.T. (1988 Ph.D.). Extractives from six species of *Lamiaceae*.
- Lukseke N.S. (1989 M.Sc.). An investigation into the properties of cotton fibres as used in nonwoven fabrics.
- Rugunanan R.A. (1989 M.Sc.). Intersolid pyrotechnic reactions of black powder.
- Sole K.C. (1989 M.Sc.). The kinetics and mechanism of the oxidation of chromium(III) chloride.
- Baxter R.C. (1989 Ph.D.). The thermodynamics of binary liquid mixtures of compounds containing multiple bonds.
- Liddell J.R. (1989 Ph.D.). Synthetic studies of swazinecic acid dilactone.
- Burton S.G. (1990 M.Sc.). A chemical investigation of *Tulbaghia violacea*.
- Whittall R.D. (1990 M.Sc.). Synthetic and spectrometric investigation of 1,4-benzoxazepines.
- Gelebe A.C. (1991 M.Sc.). Chemical studies of 1,5-benzodioxepanones.
- Drennan R.L. (1991 Ph.D.). Binary and ternary pyrotechnic systems containing manganese, molybdenum, barium peroxide and strontium peroxide.
- Learmonth R.A. (1991 Ph.D.). Studies in asymmetric synthesis.

- Grue M.R. (1992 M.Sc.). A study of the alkaloid content of the *Senecio speciosus/macrocephalus* complex.
- Schutte R. (1992 M.Sc.). The exploitation of methane from landfill.
- Siswana M.P. (1992 M.Sc.). Phase equilibria in three component systems: alcohol-hydrocarbon-water.
- Taylor S.J. (1992 M.Sc.). Exploratory studies of novel ligand systems.
- Davidson D.N. (1992 Ph.D.). Chemical and spectroscopic studies of chromone systems.
- Fowler W.M. (1992 Ph.D.). Interaction of selected fungicides with insoluble bovine skin collagen in the presence of the non ionic surfactant Triton X-100.
- Rugunan R.A. (1992 Ph.D.). Intersolid pyrotechnic reactions of silicon.
- Coetzee A. (1993 M.Sc.). Thermal decomposition of mixed metal oxalates.
- Ramaite I.D.I. (1993 M.Sc.). Chemical and spectroscopic studies of chromone derivatives.
- Mercer-Chalmers J.D. (1993 Ph.D.). The thermodynamics of solutions and binary liquid mixtures.
- Davidson R.J. (1993; (DSc) Innovations in gold extraction.
- George R. (1994 M.Sc.). Synthesis and conformational studies of indolizines.
- Bode M.L. (1994 Ph.D.). Synthetic and spectroscopic studies of indolizine derivatives.
- Mphahlele M.J. (1994 Ph.D.). Synthetic and spectroscopic studies of 1,4-benzodiazepine analogues.
- Ravindran S.S. (1994 Ph.D.). Studies in asymmetric synthesis.
- Whittaker R.E. (1995 M.Sc.). An investigation of reactions directed towards the synthesis of 2-methyl-2-(methylthio)propanal oxime.
- Gelebe A.C. (1995 Ph.D.). Synthetic and spectrometric studies of benzodioxepinone derivatives.
- Tribelhorn M.J. (1995 Ph.D.). Reactions of iron- and zinc-fuelled pyrotechnic systems.
- Bacsa J. (1996 M.Sc.). Structures and thermal behaviour of some monooxalato and dioxalato metal complexes.
- Deane P.O'G. (1996 M.Sc.). Synthetic and mechanistic studies of heterocyclic systems.
- De la Croix A. (1996 M.Sc.). Computer modelling of the thermal decomposition of solids.
- Venables D.S. (1996 M.Sc.). Reduction of tungsten oxides with carbon and hydrogen.
- Logie C.G. (1996 Ph.D.). The pyrrolizidine alkaloids of *Senecio chrysocoma* and *Senecio paniculatus*.
- Taylor S.J. (1996 Ph.D.). Computer modelling of pyrotechnic combustion.
- Collett L.A. (1997 M.Sc.). Structural and stereochemical investigations of terrestrial and marine pyrone metabolites.
- Guthrie-Strachan J.J. (1997 M.Sc.). Chemical studies of necic acid analogues.
- Hagemann J.P. (1997 Ph.D.). Design, synthesis and evaluation of novel metal complexing agents.
- Nelwamondo A.N. (1997 Ph.D.). Solid state thermal decomposition of amide complexes of nickel(II) chloride.
- Ramaite I.D.I. (1997 Ph.D.). Synthetic and physical organic studies of chromone derivatives.
- Mafatle T.J.P. (1998 M.Sc.). Homogeneous and heterogeneous catalytic activity of metallophthalocyanines towards electrochemical detection of organic compounds.
- Nocanda X.W. (1998 M.Sc.). A synthetic and spectrometric study of the initial phases of urea-formaldehyde resin formation.
- Evans M.D. (1998 Ph.D.). Asymmetric induction in reactions of chiral carboxylic esters and silyl enol ethers.
- Matjila J.M. (1998 Ph.D.). Applications of camphor-derived chiral auxiliaries in the asymmetric synthesis of α -amino acids and other systems.
- Molema W.E. (1998 Ph.D.). Camphor-derived chiral auxiliaries in asymmetric synthesis.
- Robinson R.S. (1998 Ph.D.). Baylis-Hillman derived benzopyrans and related systems — a synthetic and mechanistic study.
- Lack B.A. (1999 M.Sc.). Electrochemical studies of gold bioaccumulation by yeast cell wall components.
- Limson J.L. (1999 Ph.D.). Electrochemical studies of metal-ligand interactions and of metal binding proteins.
- Sekota M.M.C. (1999 Ph.D.). Catalytic reactions of platinum group metal phthalocyanines.
- Antunes E.M. (2000 M.Sc.). Stability of prochlorperazine in solution and in the solid-state.
- Chen Y.-J. (2000 M.Sc.). The solubility enhancement and the stability assessment of rifampicin, isoniazid and pyrazinamide in aqueous media.
- Klein R. (2000 M.Sc.). Asymmetric α -alkylation reactions.
- Beukes D.R. (2000 Ph.D.). Structural and synthetic investigations of South African marine natural products.
- Nensala N. (2000 Ph.D.). Photocatalytic reactions of metal diphthalocyanine complexes.
- Wellington K.W. (2000 Ph.D.). Synthetic and analytical studies of biomimetic metal complexes.
- Hlabela P.S. (2001 M.Sc.). Design, synthesis and characterization of novel rhenium(V) and technetium(V) complexes as potential radiopharmaceuticals.
- Klaas P.J. (2001 M.Sc.). Novel approaches to the synthesis of quinolene derivatives.
- Seotsanyana-Mokhosi I. (2001 M.Sc.). Photosensitizing properties of non-transition metal porphyrins towards the generation of singlet oxygen.
- Datt M.S. (2001 Ph.D.). Synthesis and characterisation of novel platinum(II) complexes: potential chemotherapy.
- Daubinet A. (2001 Ph.D.). Design, synthesis and evaluation of silver-specific ligands.
- McPhail K-L. (2001 Ph.D.). Extractives from six species of South African marine *Opisthobranch* mollusks.
- Nocanda X.W. (2001 Ph.D.). Application of Baylis-Hillman methodology in the synthesis of chromone derivatives.
- Sabbagh L.V. (2001 Ph.D.). Chemical studies of chromone derivatives.
- Grootboom N. (2002 M.Sc.). Alkane oxidation using metallophthalocyanines as homogeneous catalysts.
- Melane B.B. (2002 M.Sc.). Thermal and photostability studies of furosemide and its cyclodextrin mixtures.
- Tshikhudo T.R. (2002 M.Sc.). Development of nickel-selective molecularly imprinted polymers.
- Wisch G.A. (2002 M.Sc.). Synthetic approaches to marine labdane diterpenes.
- Maree M.D. (2002 Ph.D.). Effects of axial ligands on the photosensitizing properties of silicon octaphenoxypthalocyanines.
- Maree S.E. (2002 Ph.D.). Effects of substituents on the photosensitizing and electrocatalytic properties of phthalocyanines.
- Nchinda A.T. (2002 Ph.D.). Chemical studies of selected chromone derivatives.
- Oni J.I. (2002 Ph.D.). Detection of neurotransmitters using metallophthalocyanines as electrocatalysts.
- Van Hille R.P. (2002 Ph.D.). Biological generation of reactive alkaline species and their application in a suitable bioprocess for the remediation of acid and metal contaminated wastewater.
- Vilakazi L.S. (2002 Ph.D.). Catalytic behaviour of metallophthalocyanines towards the detection of nitric oxide.
- Dzaha T. (2003 M.Sc.). Cyclodespsipeptides from a Kenyan marine cyanobacterium.
- Gxoyiya B.S.B. (2003 M.Sc.). Synthesis and evaluation of PMG-selective ligands.
- Matlaba P.M. (2003 M.Sc.). Synthesis of zinc phthalocyanine derivatives for possible use in photodynamic therapy.
- Antunes E.M. (2003 Ph.D.). Pyrroliminoquinone metabolites from South African lantrunculid sponges.
- Gray C.A. (2003 Ph.D.). Structural and synthetic investigations of diterpenoid natural products from Southern African marine invertebrates.
- Lack B.A. (2003 Ph.D.). Metal interactions with neural substrates and their role in neurodegeneration.
- Musa M.A. (2003 Ph.D.). Applications of the Baylis-Hillman reaction in the synthesis of coumarin derivatives.
- Ozoemena K. (2003 Ph.D.). Metallophthalocyanines as photocatalysts for transformation of chlorophenols and self-assembled monolayers for electrochemical detection of thiols and cyanides.
- Rotich M.K. (2003 Ph.D.). Stability studies of some substituted aminobenzoic acids.
- Thamae M.A. (2003 Ph.D.). Metallophthalocyanine derivatives as catalysts for the detection of sulphur dioxide, cyanide, nitrite and amino acids.